Introduction

THE GOAL OF THE LAUNDRY OPERATION

"To consistently produce an acceptable quality of merchandise at a competitive cost and in sufficient quantity to satisfy the demands of all customers (outlets), on a timely basis, in a clean, safe production environment"

GOAL CLARIFICATION

To enhance our understanding of the Laundry Manager's and Laundry's goal we should probably clarify the meaning of certain words as follows,

- Consistently

  By consistently we mean produce the same quality level every working day. Few things are as disruptive to good customer service as variations in the perceived quality level of the products being delivered. The customer is quick to note that one delivery is clean, bright, and crisp and the next is dingy, dull and limp.

- Acceptable Quality

  By acceptable quality we mean Brand Standards.

- Competitive

  At a competitive cost we mean the best cost attainable with the equipment and facilities provided. It is understood that when equal management skills are applied, that modern state of the art equipment will produce a better unit cost than older less efficient equipment. However, we do expect our laundry manager to attain a high level of efficiency, commensurate with engineered standards, industry averages and manufacturer's claims for equipment that is provided.

- Sufficient

  In sufficient quantity for all customers' demands, we mean full loads. Shortages must be reported and measured, and our Laundry manager must take the necessary steps to eliminate shortages.

- Timely Basis

  On a timely basis means having the merchandise on the floors before the room attendants report to the work stations. Have room attendants work over due to lack of product undermines customer confidence in your ability to properly service them

- Clean

In a clean environment we mean having clean floors, clean equipment, clean linen carts, and an orderly facility. Cleanliness is next to Godliness in our industry and it is next to impossible to attain the goals of laundry management in a cluttered, disorderly, dirty facility.

- Safe

In a safe environment we mean one in which our team members can work with little likelihood of having an accident. We have a moral obligation to avoid human suffering and a financial obligation to keep insurance premiums at a minimum.

Laundry Operations Manual Table of Contents:

Chapter 1
Function of Laundry Operation

A hotel's laundry must supply textiles for the hotel's operation. Its responsibility begins when the soiled work is received and ends when it is cleaned and ready for delivery to the storage area.

The necessary first step in laundry efficiency is to develop a written program that is agreed upon by all concerned parties before the architect begins his work. This manual is designed to aid the writing of this program by outlining specific area and equipment requirements.

It is obvious that each laundry will have its own special problems and requirements, but the general requirements for laundries are contained in this manual.

I. TEXTILE INVENTORY

Responsibility for maintaining an adequate supply of textiles for processing is the Housekeeper's and Comptroller's. Failure to maintain inventory sufficient to meet the hotel's needs will cause overtime, excessive staffing, increased utility usage, and supervision difficulties, all of which result in a significant increase in cost. This increased cost is not readily identifiable because it is spread among various operating departments in the hotel. The most successful formula for determining textile needs is one based upon each hotel's:

- Guest and bathroom set-up
- Number of outlets using table linen
- Hours per week of laundry operation

Low textile inventory is one of the main causes of inefficient laundry operations. Low textile inventories will cause extended working time because textiles for processing will not be available when the capacity for production is available. The budget requirements for textiles are to be established each year with the comptroller in order to have sufficient money to keep supplies up. It is the responsibility of the housekeeper, the comptroller and the general manager to have sufficient textiles available.

II. CHEMICALS

In order to provide acceptable textiles, **proper** wash formulas and chemicals to be used; Our hotel has entered into corporate contracts with chemical companies to provide the services required.

The cost is based on a 100 lb. weight price. In order to ensure that quality is maintained standard wash formulas were provided to the chemical suppliers.

Under use of chemicals can result in several problems: unclean textiles, excessive length of wash cycles which cause textile damage and loss of productivity or excess temperatures which cause permanent damage and increased utility costs. Overuse results in unnecessary expense and can reduce textile use-life.

Therefore hotel laundries have to be very careful to use sufficient chemicals, temperature and time - but no more than necessary.

III. UTILITIES

A steady textile supply through the laundry depends upon the provision of an ample supply of adequate utilities and such related factors as

- Water softness
- Water volume
- Hot water temperature
- Steam pressure
- Air pressure
- water pressure
- drains
- electrical service
- lighting
- ventilation

Deficiencies in any of these areas will have a detrimental effect on the laundry's productivity and quality.

The second most frequent limitation experienced by hotel laundries is inadequate utilities. Equipment is manufactured with specific utility requirements. Any reduction of air pressure, steam pressure, steam quantity, electrical service, drain sizes, etc., will have a detrimental effect on production. When maintenance departments try to minimize their costs by reducing services to the laundry, they may instead increase substantially the laundries operating costs.

IV. STAFF

Some hotels require the laundry to expand its duties to include pickup of soiled textiles and delivery of clean textiles to the guest floors, kitchen areas, and housekeeping. If this is the case, it is essential that the laundry staff also be sufficiently adjusted. The basic (defined) laundry labor cost must be isolated, so that equitable evaluation and comparisons can be made.

V. SPACE

The laundry is a **production** area which must not accept stagnant (semi-permanent) storage. If stagnant storage is to be maintained in the laundry, the space needed for such storage must be added to the laundry's total space requirements, so that it will not interfere with production. The physical space available for the laundry department (and its configuration) are as strong determinants of the potential capacity of the laundry as are textile inventory, utilities, equipment or staff. It must be understood that an efficient, productive laundry balances each of these components.

If there is insufficient space for the laundry to operate or if laundry space is being used for storage, an efficient, operation can not be accomplished. For new laundries we can calculate:

Business/Family Hotels	Up to 300 Rooms	3.5 ft^2/lb./hr.
Business/Family Hotels	Over to 300 Rooms	3.25 ft^2/lb./hr.
Resort Hotels	All Sizes	2.85 ft^2/lb./hr.

VI. EQUIPMENT

The amount and type of equipment selected for a given laundry installation can only be determined once space, area configuration, utility availability, and work load have been determined. The productivity of equipment is **ABSOLUTELY** dependent upon these factors. The cardinal sin in laundry operation is in purchasing equipment without providing for adequate support from other components. Inadequate or obsolete equipment will reduce production. The engineer must advise management of the life expectancy of the equipment. Provisions must be made for total or partial replacement whenever required.

SUMMARY

A hotel laundry is a production department with exactly the same conceptual requirements as any other production operation. The same industrial engineering tenets and work patterns must be studied and strictly adhered to so that a safe and efficient operation will produce quality products. The linen storage room should be close to and readily accessible by both housekeeping and laundry departments.

Chapter 2
Basic Operational Needs

I. PRODUCTION STANDARDS/TRAINING

A. Before attempting to set-up your Production Standards, make certain that all conditions are as nearly perfect as possible by following these steps:

1. Study methods being used and try to simplify and improve them.
2. Establish a definite sequence in performing the operation.
3. Be sure workers are properly trained and fully understand the job.

In a large laundry operation, it will be necessary to use actual time study techniques for setting up the Production Standards.

B. In a small operation, the following guidelines can be used to establish some fundamental production standards:

1. Put the workers at ease, and explain that they are to perform the operation in a normal manner.
2. Be sure the workers follow the proper sequence of operation each time they go through the elements of the job.
3. Keep the worker's interest, and make sure they are performing each task correctly and at a normal working pace.
4. Establish your production standards based on what a worker can produce, performing the given task correctly, under normal working conditions, with suitable time out for rest, and can be maintained throughout the entire work period.

After establishing your production standards, use them to improve your laundry team. Let the workers know their par and whether they are maintaining their averages, and make certain the laundry team knows the score at all times. **GIVE PUBLIC RECOGNITION TO ALL LAUNDRY EMPLOYEES WHO ARE PERFORMING WELL.**

Always remember that it is impossible for any worker to have an incentive to improve their performance if there is no way of measuring performance.

It is very important to point out the fact that the Laundry Manager will seldom receive praise for doing a good job, but they should not be discouraged. It is the Laundry Manager's responsibility to do a good job.

NOTE: The greatest reward any Laundry Manager can receive is to have those under their direction say they are better people, better workers, or can do a better job because of their direction and leadership. This is the type of management that builds morale, and morale is the backbone of any successful laundry operation.

II. SORTING FUNCTION SEQUENCE

A. **Sorting:** Work should be sorted according to the techniques to be used in their processing. Sheets, pillowcases and other small items should be sorted, washed, and conditioned (if necessary) separately so that work received at the ironer will be in groupings while corresponding to ironing requirements.

III. WASHROOM FUNCTION SEQUENCE

It is important to emphasize the sequence to be followed if consistent production is to be achieved. Practically all laundry operations which do not achieve the very conservative requirement of 1.2 loads per machine per hour fail to follow the procedures outlined here and to use a production sheet.

A. Sequence: At the end of the day the washman, who stays one hour after the production crew leaves, should unload work-in-progress and reload all washers for the next day. He should then arrange a second sorted load for each washer in carts in the soil sort room.

Do Not leave no-iron textiles unfolded overnight. See further discussion in the dryer section.

B. Washing: Care in washing to control sour and extraction is necessary or rolling; damp textiles or poor finish quality will result. Too much sour or improper rinsing will cause "browning" of the goods.

To cure these conditions, rewash and extract while checking sour quantity used and extracting to approximately 35%-45% moisture retention. Then re-iron.

CHRONOLOGICAL WASHROOM SEQUENCE:

1. Start washer.
2. Aid sorter in preparing future loads.
3. Unload washers.
4. Reload washers and start them.
5. Start dryers.
6. Repeat steps 2-4 if large laundry or steps 2-5 if small laundry.
7. Stop washing non-irons 1 1/2 to 2 hours before production crew finishes its shift.
8. During the final 1 1/2 to 2 hours concentrate on producing rags, full dry (terry), and other items which will not be harmed by standing dry and unfolded overnight.
9. Load washers for next morning.
10. Prepare second washer round for the next morning in soil sort area.
11. Turn in production sheet for each washer to supervisor.

NOTE: Normally uniforms should be the first and last completely processed loads of the day. The last load is the last load to be fully processed and folded. The final wash load through the washers should be rags accumulated during the day, provided there is sufficient time to completely dry them, followed by a 15 minute cool down cycle.

This process has to be carried out under supervision. If this can not be assured, rags should be washed during the day while proper supervision is available.

IV. DRYING AND CONDITIONING FUNCTION SEQUENCE

A. Conditioning of work to be ironed is accomplished by removing moisture in a drying tumbler (dryer). The reasons for conditioning are:

- Poor extraction - a washer may not meet the 220 G force minimum requirement for extraction equipment.
- Too short an extraction cycle for the items ironed.
- The need for higher production rate (speed) of ironer.
- To eliminate multiple passes of work through an insufficient or inefficient ironer.
- To compensate for low ironing temperatures (low steam pressure) a steam pressure of 114 psi to 125 psi is standard.

Normally pillowcases and napery should be conditioned for 4 to 8 minutes to allow efficient ironing speeds.

If dryer capacity is marginal it is highly advantageous to separate terrycloth bath mats from other terrycloth items. Terrycloth bath mats require 50 - 75% more time to dry than other lighter weight articles. Therefore, since they are a low-volume item, it is to your advantage to dry them separately.

B. DRYER-AREA FUNCTION SEQUENCE

1. Check to see that lint filters are clean;
2. First load all no-iron textiles -- other than terry -- to the proper capacity and start dryers;
3. Check settings on the face of the dryer to make sure that they are appropriate to the load;
4. Fill in time and work sheet category loaded into that dryer onto the production sheet;
5. Repeat steps 1-4 for each dryer;
6. As soon as the dryer stops unload it and make sure that it is taken directly to the folding area;
7. Reload the dryer, repeating steps 1-4;
8. If an oversupply of dried no-iron items are building up in the folding area, load the next dryers with terrycloth or other non-temperature critical items.
9. At the end of the day if any no-irons are left unfolded, they must be washed and dried the next day, if acceptable quality is to be achieved;
10. No textiles (dry or wet) should ever be left in a gas dryer. Dried textiles can, however, be left in steam and electrical dryers;
11. Rags are never to be dried unsupervised. Their drying cycle is to be followed by a minimum of 15 minutes cool down, and rags are <u>always</u> to be removed from the dryer as soon as they are properly cooled down.
12. Clean lint filters;
13. Once each week use compressed air to blow through the steam coils while the empty dryer is running; and
14. Turn in production sheet to supervisor.

NOTE: 90% of all laundry fires are attributable to rags not being washed and dried properly.

V. IRONING/FOLDING FUNCTION SEQUENCE

A. **Shaking out for Ironing** is the preparation of work to be ironed by laying it out to facilitate ironer production.

B. **Sheets** Cotton sheets almost always require shake out preparation, because the lubricity of wet all cotton sheets is quite low and they will tend to "knot". While polyester/cotton blend sheets, for hotels under 200 rooms seldom need shaking out, they can be picked out of the cart by the feeders and fed.

C. **Small Pieces** Napkins, pillow cases, etc., should never be pre-shaken. The feeders should feed directly from the ironer feed carts or from the feed trough. Aprons are exceptions to this rule. Because of the strings or ties, aprons should be shaken out (laid out) for feeding.

D. **Ironer Feeding** is the act of placing the item into the ironer.

Sheets

- 2 feeders grasp the sheet in one hand and place one corner onto the feed ribbon;
- With the other hand, they feed and pull the other end of the sheet toward the ironer;
- feeders pick up trailing edge with same hand used to feed and drape sheet in front of the ironer smoothing with feed hand;
- The other hand then reaches for the next sheet.

Small Pieces Feed small pieces from feed trough without pre-shaking.

- Normally, on a 120" ironer 4 feeders and 2 receivers are used.
- Always use entire ironer capacity.
- If a little piece accumulating stacker is used, there can be 4 or 5 feeders and 1 receiver, depending on the size of the machine.

Aprons should be shaken out so that they can be placed (in stacks) across the feed - avoid tangles in the folder.

VI. HANDLING POLYESTER BLEND SHEETS

A. Ironing

After extraction, the water content of polyester and cotton blend sheets will be, perhaps, about 30% to 35% of the dry weight of the sheets. Actual water content depends upon several factors but primarily upon extraction efficiency. This implies that about 4 gallons of water 33 lbs is removed per 100 pounds of dry sheets during ironing. By way of contrast, all cotton sheets may retain about 6.5 gallons of water per 100 pounds dry weight. Obviously, blend sheets will iron faster than all cotton sheets. Unfortunately, the rapid drying of blend sheets also leads to overheating and consequent damage to the sheets in some cases.

The principal damage to blend sheets in overheating occurs through thermal contraction and even fusion of polyester fibers. Polyester fibers begin to contract significantly when heated above 360^{o} Fahrenheit in a relaxed state. Contraction increases rapidly as fiber temperature increases and appears to occur almost instantaneously to a casual observer at an ironer. Actually, some small amount of time is required for contraction and, as a result, progressive contraction will occur with repetitive excessive heating. The result is high shrinkage which progresses as the number of times of excessive heating in ironing increases.

Normally sheets are fed into ironers with a selvage leading. Tension is applied only across the width of the sheet. There is no tension along the length of the sheet and it is free to relax and contract. Highest shrinkage, therefore, generally occurs in the length of the sheet. In extreme cases, the polyester fibers contract to a coiled and entangled configuration. When such occurs, the fabric shrinks appreciably and becomes very stretchy or even rubbery.

Hot oil (thermal oil) ironers are sometimes operated at oil temperatures in excess of 400^{o} Fahrenheit. A rationale for the use of such high oil temperatures is to provide a large temperature differential above the boiling point of water, 212^{o} Fahrenheit, and thereby increase the rate of drying and ironer production. It works thermodynamically and in practice. The danger is that the temperature of the sheet rises rapidly when completely dried. The specific heat, or energy required for heating of polyester fiber is very low. Therefore, the temperature of the polyester in a blend sheet virtually jumps to the temperature of the ironer chest surface when the fabric is dried. Excessive chest temperatures lead to excessive fabric temperatures.

The solution to thermal shrinkage in blend sheets on hot oil ironers is apparent:

1. Don't over-dry;

2. Reduce oil temperature.

Actually, of course, the two go hand in hand. One ready check of fabric temperatures in ironing is provided with the use of **temperature indicator papers** from: **The Paper Thermometer Company, Greenfield, New Hampshire, 03047**. A way to monitor moisture content in ironed sheets is with a **fabric moisture monitor** as supplied by **Strandberg Engineering Laboratories, Greensboro, North Carolina, 27406**. Such controls do not necessarily imply loss of production or reduced ironer throughput.

Controlled ironing temperature and conditions may also provide such ancillary benefits as reduced static generation, lower ambient working temperature, increased life of sheets and lower fuel costs.

NO-IRON PROCEDURE FOR PROCESSING TEXTILES

I. DEFINITION

A. No-Iron

Refers to a processing method (without ironing) of an appropriate fabric such as polyester-cotton. Polyester-cotton is not a no-iron fabric but can be processed using the no-iron technique.

B. Detergent System

The detergent should always include a nonionic surfactant either alone or in combination with an anionic surfactant to ensure cleaning of polyester fiber. Use sufficient detergent for good soil suspension.

II. WASHING

1. Start washer.
2. Aid sorter in preparing future loads.
3. Unload washers.
4. Reload washers and start them.
5. Start dryers.
6. Repeat steps 2-4 if large laundry or steps 2-5 if small laundry.
7. Stop washing non-irons 1 1/2 to 2 hours before production crew finishes its shift.
8. During the final 1 1/2 to 2 hours concentrate on producing rags, full dry (terry), and other items which will not be harmed by standing dry and unfolded overnight. No-iron textiles **must not** be left unfolded overnight. This is discussed further in the dryer section.
9. Load washers for next morning.
10. Prepare second washer round for the next morning in soil sort area.
11. Turn in production sheet for each washer to supervisor.

NOTE: Normally uniforms should be the first and last completely processed loads of the day. The last load is the last load to be **fully** processed and folded. The final **wash** load through the washers should be rags accumulated during the day, provided there is sufficient time to completely dry them, followed by a 15 minute cool down cycle. This process has to be carried out under supervision. If this can not be assured, rags should be washed during the day while proper supervision is available.

III. SPECIFICS FOR DRYING NO-IRON TEXTILES (includes terry textiles)

The chart on the front of the dryer should appear as follows:

DRYER SETTINGS
(Optimum and Test Starting Points)

	Terry Mats	Terry Other	No-Iron Napery	No-Iron Sheets and Pillowcases	Other
Time	32 minutes	22 minutes	10 minutes	15 minutes	
Temperature	200° Fahrenheit	200° Fahrenheit	180° Fahrenheit	180° Fahrenheit	
Cool Down	3 minutes	3 minutes	3 minutes	3 minutes	
Quantity	80 %	80 % +	20 to 30 pieces or 30 to 40 lbs.	20 to 30 ea./ or 30 to 40 lbs.	
Comments:					

A. Time Settings

Once a dryer has been loaded and the thermostat has been set up properly, the time required to dry that particular load should be determined. With a well-installed high energy dryer, terrycloth mats should dry in 32 minutes, other terrycloth toweling in 22 minutes, no-iron napery in 10 minutes, no-iron sheets and pillowcases in 12 minutes. The procedure for determining these times for sheets and pillowcases is as follows: load a dryer with 20 sheets, set the dryer thermostat at 180° Fahrenheit, and set the timer for 12 minutes with 3 minutes cool-down. If at the end of the cycle the load is dry, reduce the time to 10 minutes heat and three minutes cool-down, re-load and repeat until the minimum drying time has been determined. Once the time for sheets and pillowcases in one dryer is set, load each of the dryers in your laundry with sheets and pillowcases and start them at the same time using the same procedure to insure that a poor exhaust system is not interfering with a dryer's efficiency. Then record the settings on the front panel of the dryer by the timer.

Repeat this procedure for each of the items; terry mats, other terry items and shower curtains, blankets, etc.

If dryer capacity is marginal it is highly advantageous to separate terrycloth bath mats from other terrycloth items. Terrycloth bath mats require 50 - 75% more time to dry than other lighter weight articles. Therefore, since they are a low-volume item, it is to your advantage to dry them separately.

IV. FOLDING & STORAGE

A. Folding Area

The presentation of the final product is the goal and purpose of the laundry. The folding function is the final processing technique in the production of high quality textiles and napery. Every function in the laundry leads to this: failure to fold immediately and properly will undo all of the prior steps, regardless of the care taken.

NOTE: No-iron flatwork textiles must be folded immediately after drying. If they are allowed to sit in a cart for even a short period of time or have excessive weight or pressure placed on them in the cart, they will wrinkle.

B. Workflow Patterns

The folding area should be close to the dryers. This is to insure that no-iron textiles are taken from the dryers as soon as they are processed. The flow within the folding area should be from the dryers toward the textile storage area, whether this is in Housekeeping or in a holding area within the laundry, for accumulation prior to being taken to the floors. Next to the towel folder should be a folding table for bath mats, wash cloths, etc.

(Remember, no-iron textiles are not good cleaning rags since they are not absorbent.)

V. LINEN CONTROL CLOSETS

Each section of the Linen Control Closet holds a 24-hour textile requirement. The shelves are clearly marked with the 24-hour par requirement for each item in that closet. The Room Attendants' carts are stocked from the open section and the other section remains locked for use the following day. Any textiles remaining on a Room Attendant's cart at the end of the day is unloaded and returned to the same section of the Linen Control Closet from which it was taken. The Evening Room Attendant's cart is filled from this same side.

The Day Floor Supervisor makes certain that the Day Room Attendants' carts have been emptied and the Evening Room Attendants' carts have been filled. She then makes a physical count of the textiles that remain. The difference between the par stock and the physical count is the textile requisition. The Floor Supervisor hands in this textile requisition to the Linen Room before going off duty.

A. Benefits

1. Facilitates the maintenance of adequate textile pars.
2. Ensures correct rotation -- which is very important for no-iron textiles.
3. Reveals shortages.
4. Avoids overstocking or hoarding of textiles.
5. Frees space in the Main Linen Room.
6. Eliminates traffic on the service elevators during busy periods since restocking can be done at night.

Chapter 3
SOIL SORT CATCHMENT AREA

Most non-use damage to textiles damage caused by mildew, tears, concrete stains, set stains, and insects occur in this area. Non-guest damage causes more textiles to be discarded than guest-caused damage. While some other damage is to be expected, this kind of damage is absolutely unnecessary and can be avoided by proper construction of the area and by implementation of some simple procedures. Practically all soils introduced by guests can be removed by good laundry practices.

PHYSICAL REQUIREMENTS

I. THE CHUTE

Proper construction and installation of the linen chute is the first step toward eliminating maintenance and textile damage in the soil-sort catchment area.

A. Construction

The chute must be constructed with no screws, rivets or other projections on the interior surface. It must be straight and plumb with offsets, and have expansion joints between support levels.

B. Material

The portion of a gravity linen chute located not more than six stories below the roof of a building shall be made of steel (stainless, galvanized or aluminum coated steel) not lighter than 18 U.S. gauge and any other portion shall be made of steel not lighter than 16 U.S. gauge.

C. Vent

All gravity linen chutes shall be vented to atmosphere at roof. Although not per N.F.P.A. standard #82, a satisfactory alternate is a 3" diameter vent as shown:

D. Size

Standard sizes are from 24" to 30” diameter, if in sensitive area, chute can be sound-insulated with fiberglass blanket during installation.

E. Intake Doors

Preferred are side hinged 21" X 18" doors with full 180^{o} swing with locks. Doors should have U.S. fire rating: "1/2 hour 'B' temperature, rise 30 minutes, 650^{o} Fahrenheit maximum."

F. The Bottom Curve

This is the critical point of the chute. If the angle of the chute is too sharp, vibrations will be sent up the chute, cracking the wall where the linen chute door protrudes into the back landing. To remedy this:

- install the bottom angle at no more than 30^{o}
- make the bottom angle or curve of the chute independent from the rest of the chute;
- make the bottom of the chute opening at least 6' - 8' from the floor.

G. Fire Door (Automatic for damper):

All chutes should be equipped with a self-closing fire door that is held open by a heat sensitive fuse having a fire containment rating of not less than 1 hour. This is to prevent the chute from becoming a chimney in the event of a fire.

H. Sprinklers

All linen chutes should be equipped with a sprinkler system for fire protection. This is normally done by installing sprinkler heads on alternate floors. The heads are to be located in the top corner of the intake door throats and guarded from falling textiles.

I. Inspection

There can be no sharp edges in the chute which could snag or catch textiles as they are dropped down the chute. Sheet metal joints have a tendency to separate over a period of use. Therefore, monthly drop inspections are essential.

- Drop Inspection: Fill a lightweight paper bag, of sufficient size to fill the circumference of the chute, with a relatively light fabric or pillows, etc. The bag should be perforated with a substantial number of holes before it is dropped in order to limit the ruptures at the bottom of the chute. Drop this bag from the top floor and inspect the sides of the bag. If there are scratches or cuts, the tests should be repeated, starting with the bottom chute opening and working up, until the area where the damage is identified.

- Visual Inspection: Annual visual inspections are necessary to identify potential problem areas. An engineer should either be lowered through the interior of the chute or be given a tool which he can use to identify chute damage between floors.

J. The Bottom of the Chute

Where it enters into the soil catchment area, should be six, to eight feet from the floor.

1. Slide: A slide should be provided to divert the work, preventing textiles to pile and clog the chute.

2. Sorting Platform: It is highly efficient to provide a sorting platform on which textiles will be stored until sorted. This platform can be constructed of wood coated formica or stainless steel. It must slope sufficiently downward from back to front away from the mouth of the linen chute to prevent blockages, and toward employee to facilitate ease of sorting. The sorting area of the platform should be 24" - 30" higher than the floor to reduce the bending required of the sorter and reducing the possibility of injury. Use of the platform insures that the first work down the chute is the first work processed, and so reduces the likelihood of mildew, bacterial and insect damage. The sorting platform keeps the textiles off the floor and reduces stains from concrete and other inert soils.

3. Conveyor: A large hotel may want to install a sorting conveyer under the chute. This conveyor serves both as a slide and sorting platform.

When a conveyor is used, it is essential that a textile-restricting door be placed on the chute so that work can be metered onto the conveyor.

4. **Floors**: All exposed concrete must be tiled with vinyl type product in order to prevent staining to textiles. No exposed iron pipes or rods can be allowed to come in contact with textiles. Tile must be of a type which can be affixed with an adhesive and can be cleaned with water.

5. **Walls**: Walls should be painted with a high gloss soft paint of a light shade. The high gloss is for washability and the light shade for better identification of stains.

6. **Lighting**: The soil sort room requires lighting of 70 foot-candles.

7. **Air Changes**: Heat is generally not a problem, but soil catchment areas should be ventilated to reduce odor and humidity (moisture). Twenty to forty (20-40) air changes per hour (one change every 1 1/2 -3 minutes) are necessary to minimize mildew, odor and lint accumulations. Incoming air can be from almost any odorless source. Exhaust air, however, must be vented directly outside; attempts to re-circulate this air may introduce odors and/or bacteria into the air receiving it. The soil sort area is seldom air conditioned since air from this area should be discharged immediately.

8. **Size**: The size of the soil-catchment area depends upon the size of the property and on the work schedule of the laundry. Normally, if the soil sort room contains the linen chute and the laundry operates on a 48-hour work week, approximately .5 square feet per room is required. The following dimensions are suggested:

0-125 rooms	8 x 8	64 sq. ft.
175 rooms	9 x 10	90 sq. ft.
250 rooms	10 x 12	120
300 rooms	12 x 12	144
400 rooms	12 x 16	192
500 rooms	14 x 18	252
750 rooms	14 x 26	375
1000 rooms	20 x 20	400

Note: If the chute room is separate from the soil-sort room, the chute room must be considered auxiliary space; do not, however, deduct this space from the total space required of the sorting room, unless the sorting is done in the chute room.

9. **Ceiling**: The ceiling in the soil catchment area must be flat and smooth in order to keep lint and bacteria from accumulating. All surfaces -- floors, ceilings, and walls -- must be constructed so that they can be cleaned weekly. The area must have a fire-containment rating of 2 hours.

10. **Layout**: Some soiled textiles are sent to the laundry in carts and some through the chute; therefore the soil-catchment room should have two doors, one for receiving soiled textiles, and one through which sorted bundles can be taken to be processed. Two doors are preferred in order to facilitate the use of the FIFO sorting techniques.

11. **Scale**: 4' x 4' scale platform. Scale to be lo-profile or inset flush to finished floor.

ROOM TEXTILES

Operation Productivity:

1. Chutes onto 24" - 30" high table. One (1) employee.
2. Empty soil chutes onto 24" -30" high table, 48" wide by 78" long depending on hotel size.
3. Sort into carts -NO COUNTING, should be weighed into loads on scale.
4. Rooms textiles, one (1) employee for 60 minute hour = 1323.7 lbs per eight hour day; 10,509.6 lbs. per day.
5. All labor is manual. No conveyor, no slings and nothing other than a chute.

FOOD AND BEVERAGE LINEN (Linen refers to F&B textiles regardless of fabric).

Operation Productivity:

An operator performs at 2.92 minutes per 100 pieces. He, therefore, gives us 2,000 pieces per hour, and 16,000 pieces per day in an 8-hour day, with two (2) 10-minute rest periods. No counting is involved.

Chapter 4
FUNCTION OF THE WASH ROOM

The washroom is the area between the soiled textile storage area and the storage area for the dryer/ironers.

The wash department launders textiles to make them hygienically clean. The department uses different wash formulas depending upon the degree and type of soils encountered, and fabric type and color.

The wash room is the heart of the laundry operation. It is that area required for washing and/or extract equipment, for in-use supply containers, for holding soiled textile modules preparatory to their being loaded into the washer. It does not include the soil sorting and storage areas or the drying areas. This department of a laundry allows the laundry manager to evaluate utilities, textile abuse, and the quantity of textile inventory in circulation. By the proper use of washer production sheets the laundry manager can take the pulse of the laundry portion of the entire hotel operation. In order for the laundry manager to provide this information to management, however, it is essential to adhere to the following standards and concepts.

The type of washers used and loading and unloading methods determine the processing methods used in the wash department.

The washing process is controlled by the following 4 components:

- mechanical action
- time
- temperature
- chemicals

Balance each of these components to obtain a quality product at a reasonable cost. Increasing one of the components might allow a decrease in another. The art is to increase the least costly of the components to the maximum level and adjusting the others accordingly. This action will produce the lowest operational costs.

EQUIPMENT

I. WASHER/EXTRACTORS

This machine washes and extracts textiles in the same operation and eliminating the need for a separate extraction operation. Washer/Extractors may have either open or partitioned pockets. These machines may be loaded manually or through use of slings, gravity chutes or air tubes. Washer/Extractors are manually unloaded, except with some "tilt" models.

Washer/extractor capacity may range from 25 to 1200 pounds. Capacity rating in pounds can be misleading due to the differences of textile size (bulkiness) and weight, degree of soil, etc.

Wash cylinder dimensions are sometimes used as a measure of washer capacity as is cubic feet of load space.

II. TUNNEL WASHERS

The continuous batch washer or **tunnel washer** is increasingly popular. It consists of a series of modules which are connected.

A conveyer belt, sling, or other device, feeds the textiles into the machine. An archemedic screw, lift, scoop or other transfer method moves the load from module to module. Each module represents a different washing process. Chemicals are injected into each specific module, as required.

Use recycled water between certain modules. This reduces water use to about one third of that of a conventional washer.

There have been improvements in the mechanical action of most tunnel washers has improved to match the action of conventional washers. For the most part, they can now process napery and heavy soiled textiles effectively. These soil classifications require more time and may result in a disproportionate reduction of the tunnel‘s hourly output due to increased formula time.

Most tunnels do not have centrifugal extractors connected to them. Most tunnels expel the textiles which are then transported to a press where the goods are pressed into a cake. This cake then moves on a conveyor and is placed either in a dryer or goes to a designated area from where it will be picked up to go for further processing.

III. THE WASHING PROCESS

The most common way of expressing standards of the washroom is soiled pounds per operator hour. Other standards of measurement are soiled pounds per hour and soiled pounds per day. Use soiled pounds because textiles should be weighed into loads before washing.

It is difficult to generalized standards because of many variables in the wash process. Consider length of formula time, degree of soil in the load, availability of work and type of containers.

Established standards for each laundry operation are needed to evaluate the efficiency of an operation.

PHYSICAL REQUIREMENTS

I. WASHER CAPACITY

Balance all equipment within the laundry. A surplus or shortage of any component will lead to inefficiencies. For this reason, an accurate calculation of capacities is essential. Washer capacity must be based on the total pounds of soiled textiles generated per occupied guest room; this includes Rooms, F&B, Uniforms and other laundered textiles.

A. Capacity

The capacity of the wash room equipment (washer-extractors) is determined by the following formula: (*) where 15 lbs/guest room must be processed

$$\frac{\text{Rooms x 15 lbs.(*) x 7 days}}{\text{Number of working hours}} \div 1.2 = \text{(loads per W-X/hour)}$$

Tunnel washers capacity will be provided by manufacturers guarantees.

B. Space

The type and size of equipment selected will determine the allocation of space. In addition, the configuration of space may dictate the size and number of units (washer-extractors) selected.

Given normal layout configurations the space required for the wash room only is approximately .5 sq. ft. per guest room. This figure will vary with the type of equipment selected but the laundry's total space will not be altered.

Access (6 ft. high clearance) must be allowed on all sides of all washer-extractors for repair, service, and operation.

C. Workflow Patterns

It is acceptable to design any workflow pattern which allows a direct path from soil-sort to washer and dryers without crossing the room. These are normally the straight line, L-shape or U-shape patterns. There is no functional preference as long as the pattern chosen fits the space allocated.

There is substantial legal pressure in many locales to **isolate the soil-sort area from the washroom** (clean from soiled). This should be done in all laundries with special attention to air flow.

D. Flooring

Cover the washroom floor with tile or other suitable floor finish. There is to be no bare concrete floor in areas where textiles could contact the floor. This is to prevent staining

of clean or soiled wet textiles. It is almost impossible to remove concrete stains from textiles.

Provide floor covering which can withstand heavy traffic and water, and be able clean the floor by water and/or steam. Use antistatic material.

E. Lighting

Light should be provided to the washroom at 80 - 100 foot candles. Walls, floor coverings, and ceilings should reflect without glare as much light as possible, to allow close inspection and identification of problems with equipment, textiles, and washing liqueurs.

Light fixtures can be mounted flush or recessed in the ceiling slats.

F. Ceiling

Lint, sound, and heat are generated in all areas of the laundry. It is therefore best not to lower ceiling height in the laundry areas with a **solid** false ceiling, because they hold heat at employee level.

If a laundry ceiling is to be constructed of vertical slats or of other easily removable material, these slats should be widely spaced so that they do not create a barrier to rising heat. All slats should be water resistant and easily removable for cleaning and for access to piping above the false ceiling.

Laundry ceiling height is a critical factor. A high ceiling (up to 25 feet) reduces ambient temperatures for employees. Heat rises and stratifies; the higher the ceiling, the cooler the lower areas. If air conditioners are to be used, however, a low ceiling will reduce the space which must be cooled, and should be considered.

G. Paint and Walls

Lint will adhere to any rough surface, so wall surfaces should be smooth and cleanable. The ideal wall surface for laundries is glazed tile, which can be hosed clean with water or vacuumed. If walls are to be painted, washable paint should be used. Color selection shall be made by Decorator.

Walls should be vacuum cleaned with annual washings. Do not blow walls down with compressed air. Blown lint becomes airborne; it causes cleaning problems and can create fire hazards in areas difficult to reach.

H. Ventilation

Ventilation is of major importance in providing consistently high quality textiles. After adequate equipment and inventory, no other factor will so continuously effect the production from, and the staff's attitude toward, the laundry. Major considerations in providing ventilation for the washroom are:

1. Its proximity to heat generating equipment such as ironers and presses. The only heat generated by the washroom is that radiated from hotel water and injected steam.

2. The average temperatures of outside air and/or makeup air supply to the laundry. Obviously, the lower the temperature of the outside air, the fewer the air changes (in most areas) will be required.

3. In a conventional laundry washroom, not air conditioned, up to 60 air changes per hour (one per minute) may be necessary in the summertime to make the work area acceptable.

4. In an air conditioned washroom, maintenance of desired temperatures is adequate since odor problems are minimal.

II. UTILITY USAGES

The washroom's consumption of utilities is directly proportional to the amount of equipment and the efficiency of that equipment. It is as costly to have too much equipment as it is to have too little.

A. Excess Equipment

Leads to the washing of partial loads; this causes extended formula, over-use of chemicals, inefficient use of machines, higher use of utilities, and lax staffing.

For example, all washing machines automatically fill with water to specific level. The number of gallons in a given load is therefore the inverse to the pounds of textiles in that load. More water is therefore required to process a partial load than a full load: if three gallons of water are necessary to wash a pound of textiles in a machine loaded to capacity, then a washer loaded to only one half its capacity could use approximately 6.2 gallons to wash that same textile pound. Other increased costs include:

1. Water softening
2. Steam makeup water
3. Electric expense doubles
4. Labor doubles
5. Supply cost doubles
6. Steam used from the boiler more than doubles
7. Textile life decreases due to abrasion
8. Sewer cost doubles

Since the amount of water increases and supplies remain the same, the chemical concentration decreases. So, the wash quality decreases as the size of the load decreases.

B. Hot Water

The temperature of the hot water supply into the laundry should be 140° Fahrenheit, with live steam injection provided to each piece of washing equipment. 140° Fahrenheit is the temperature at which most body soils and heavy grease saponify (convert fats to soap). Until there are detergents which will guarantee extended life to textiles without discoloration, odor, or harshness, good laundering practices require that light soils such as sheets and pillowcases, be laundered at 140° Fahrenheit. Live steam injection is required for extremely heavy soils because for stain removal temperatures up to 160° to 180° Fahrenheit are necessary.

It is more economical to maintain the hot water supply for the 90% of the work considered light soil and to inject live steam into the 10% heavy soil than to keep that laundry hot water at 160° Fahrenheit and temper it with cold water.

RECOMMENDATION: All hot water going to the laundry should be maintained at 140° Fahrenheit if live steam is available to the washers. 160° Fahrenheit is required if live steam is unavailable to the washers.

C. Steam Leaks

Can be measured directly in terms of dollar loss to the hotel. A 1/32" hole will waste up to 425 gallons of fuel oil annually. You may be assured that a steam leak will never get smaller or correct itself. If a steam leak is not repaired as soon as it develops, it will continue to enlarge and waste energy.

RECOMMENDATION: All steam leaks must be repaired immediately upon discovery or at the end of that days work shift. The Laundry Manager must report each steam leak in writing to the Chief Engineer as soon as it occurs.

D. Master Laundry Steam Valve

There should be a master steam shutoff valve on the steam supply line. Money and energy are wasted if presses and other steam heated equipment are left hot until the boiler is shut down. Normally, the maintenance department or the laundry engineer should be made responsible for turning the steam on one hour prior to the laundry start-up and for shutting the valve off immediately after or slightly before the end of the work day. Failure to install this valve and/or perform this task will result in a substantial waste of fuel.

If steam is not turned on until the laundry crew has arrived, a reverse effect occurs. The laundry's hours of operation will be extended since dryers, presses, ironers, and washers will not operate properly without adequate preheating.

RECOMMENDATION: A master steam valve must be provided to the laundry so that steam can be turned on one hour prior to the laundry operation and turned off at or slightly before the close of the laundry work day.

E. Insulating Pipes

All hot pipes and ducts in the laundry must be insulated for 3 reasons:

1. The comfort of the staff
2. The minimization of exhaust equipment required, and
3. Energy savings.

RECOMMENDATION: All hot pipes and ducts should be insulated in order to reduce fuel consumption due to heat loss through radiation.

F. Water Softening System

1. **Hard Water** extends washing time and inhibits the activity of all tallow-base soaps. It also inhibits the saponification of body soils, grease and other oily substances. It takes 1/2 pound of soap to neutralize 1,000 grains of hardness. If your local water has 25 grains per gallon of hardness and the washer requires 200 gallons of water during the suds cycles, there are 5,000 grains of hardness to be neutralized by detergent. 2 1/2 pounds of additional detergent are required just to soften the water in the washer wheel before any cleaning occurs. Higher temperatures, longer suds times, and additional rinses will be necessary to remove the extra detergent.

RECOMMENDATION: All hotels should be equipped with a water softening system to ensure hot and cold consistent water quality, if over 4 grains (75 ppm) of hardness are found in the water supply.

G. Water Re-Use Systems

Water re-use systems use the last two or three rinses from the previous formula for the flush and wash cycles of subsequent formulas. Benefits are directly related to the quantity of water **re-used**; normally 25 to 30% can be re-used without impairing the finished quality of the textiles. Factors which must be considered are:

1. Price and pricing method for water and sewer
2. Availability of water
3. Existing installation
4. Method of heating of re-use water
5. New installations
6. Type of equipment
7. Hotel size
8. Installation and equipment cost

Availability of Water: Some hotels are in locations that impose sewer-water availability limitations, which can be so severe that a water re-use system must be used just to continue the operation.

SUMMARY: It is impossible to estimate general installation costs for water re-use systems, since layouts and equipment vary dramatically from locale to locale. Existing hotels should seriously consider water re-use systems for their operations, however, all new installations should be investigated to see if such a system is feasible. These systems are not sold by laundry equipment manufacturers; they are provided and installed by specialized equipment distributors.

Note: Split trenches and waste water pit should be provided in most new installation for future use.

H. Waste-Water Heat Recovery Systems

Commercial and linen supply laundry operations have used waste water heat recovery systems for many years. No commercial laundry would consider operating without such a system. Hotels and hospitals, however, are sometimes in a location or of a size which greatly reduce the benefit of the system. Rising fuel costs and improved, less expensive recovery units have in recent years drastically reduced the size of the system which can be economically installed. Fluctuations in energy availability and cost make it prudent to review individual systems periodically.

Hot waste-water which is normally discharged to the sewer may be used to preheat incoming cold water without contamination and thereby reduce the amount of energy BTU's required to achieve the desired temperature of the incoming water.

The primary considerations are:

- Average temperature of cold water
- Cost of water
- Temperature of hot water used
- Size of operation
- Cost of energy

Summary and Comments (Waste Water Heat Reclamation)

1. Properties in warm locales do not need to consider reclamation if

   a) Fuel prices are below $2/1000 cu. ft. of natural gas or $2/2000 pounds of steam, and
   b) Incoming water is 80^{o} Fahrenheit average.

While there could be exceptions, these conditions virtually exclude the need to even consider reclamation.

2. Hotels in locations where the incoming water temperature averages approximately 50° Fahrenheit or less should consider heat reclamation from waste water.

3. The size of the heat recovery unit must be determined by the hotel needs at 100% occupancy. The volume of water needed will remain about the same down to 80% occupancy since partial loads will definitely be run during periods of lower occupancy.

4. When inventories are low, water usage increases dramatically. This condition (low inventories) necessitates partial loads, excessively strong formulas and extra stain treatments. Some hotels double the water needs by running 16-20 hours on equipment sized for 8-hour operation.

5. Underloading is wasteful because it required more hot water due to machine volume and extra load.

6. Poor wash formula, requiring extra fills and drains as well as long run times (extra live steam) also waste water.

7. The conservative nature of this report projects the savings with a 10° Fahrenheit approach. **Approach** is the temperature difference between the waste water and tempered incoming cold water in a balance system. In actual practice it may well be found that a 5° Fahrenheit approach will cost very little extra and provide significantly increased savings.

I. **Washer/Extractors Options**: The following options are required for all washing equipment:

- Live steam-injection controlled automatically;
- A timer which can be stopped by switch, while steaming automatically:
- Automatic supply injection capabilities
- Preference to be given to equipment which has two drains for water re-use And re-use water inlet valves.

J. Sinks

Every washroom must have a sink for emergency treatment of chemical, accidents, stains, soaking of problem items, and employee sanitation. For hotels of over 200 rooms a two-compartment sink is essential; for smaller hotels a one-compartment sink may be sufficient. Sinks should be stainless steel, granite or rust-proof galvanized steel with stainless steel or monel metal molded raised rim. Each sink compartment should be at least 16" deep X 24" wide.

K. Carts

Carts used to transport wet or damp work to the next process should be made of a smooth, non-absorbent, cleanable material. Carts should be a heavy duty polyethylene removable liner fitting

into a non-rust steel frame which has four non-marking swivel casters of sufficient size to roll easily on the laundry's floor (carpet, tile). Many laundries prefer the 10-bushel size (36"L X 24"W X 25"D). Automatic lifts for the bottom of carts serve no purpose and should not be purchased for transporting wet textiles to the next production process.

J. Eye Wash Sink

Must be provided where chemicals are handled.

I. OPERATING PROCEDURE

The washroom is the area between the sorted soiled textile storage area and the storage area for the dryers/ironers.

The quality and quantity of textiles produced depends upon correct practices and procedures outlined here. Problems caused by the failure to follow these procedures cannot be corrected by additional staff, by shortened wash formulas, or in subsequent production operations. **Quality** depends upon wash formulas, utilities, and maintenance of equipment. **Quantity** depends upon the number of loads received per hour from each machine.

Quantity and quality are quantifiable and problems in production of both can be pinpointed with a high degree of accuracy. Correction of the problem may depend upon one of three persons even though the direct responsibility for correction lies with the laundry manager:

- The **engineer** is responsible for the repair of the equipment, either personally or through a manufacturer's service man.
- The **supplier** should be held responsible for the quality of his supplies and for servicing the formulas.
- The **laundry manager** is responsible for production procedures, and for overseeing maintenance and supply decisions.

The laundry manager must document problems in writing, **as they occur**, with follow-up memos at frequent intervals until they are corrected or a date set for their correction.

A. Production Sheets

For management purposes the **washroom production sheet** is the **MOST IMPORTANT** single piece of information generated from the laundry.

This record should be retrieved from each machine (one sheet per machine) daily and placed in a separate notebook for each washer which can be reviewed weekly for problems analysis. Laundries also use this sheet to note all breakdowns and repairs made on individual washers. This provides a continuous ongoing record of down time and the necessary information for equipment replacement.

B. Quantity

This production record provides the laundry manager with information essential to the efficient operation of the laundry. This information includes:

1. Down time or lag time between loads;
2. Number of loads per operating hour;
3. Correct operation and formula selection;
4. Identification and recording of machine problems for each machine;
5. Identification of work flow problems which develop. Typical work flow problems could be caused by lack of textile inventory, carts, utilities, insufficient dryer capacity, etc.

Proper use of the production record will also identify utility problems such as low steam pressure or insufficient hot water, since modern washing machines will not continue through their cycles until the proper temperature and pressure have been achieved.

The hourly production rate of each machine can readily be reviewed by the use of the Washer Daily Production Sheet.

Each washer/extractor must average 1.2 full loads per hour throughout the work week. Failure to achieve this level of productivity will result in either extended work hours or the purchase of excess equipment; and both alternatives are extremely expensive.

NOTE: All calculations for determining washer-extractor capacity requirements for properties are based upon 1.2 loads per hour for an eight hour day. The staggering of two employees, one starting an hour before the full crew begins work and the second an hour after the full crew leaves provides two additional hours of washer-extractor operation without overtime. This is a 25% increase in the productive capacity of the laundry (that is, it allows a safety factor which in turn allows a margin for production problems).

C. Textile Quality

The quality of the textiles received from the washroom is nearly impossible to evaluate visually. Conditions leading to good quality, however, should be constantly monitored to allow rapid identification of situations which are detrimental to quality. The **Washer Production Sheet** enables management to analyze each step of the washroom process exactly and determine whether potential problems exist. The Production Sheet of each washer will provide a continuous record of:

- What is being processed,
- Whether items processed are being laundered with the proper formulas,
- Whether washer hang-up is due to mechanical, electrical, or utility problems, and
- Whether the washperson is attending to his job.

II. LOADING FACTORS

Manufacturers determine the size of the washer/extractor by dividing its cylinder volume (in square feet) into the manufacturers rated capacity (in lbs.) for that machine. For example:

$$\frac{\text{75 lb. Capacity}}{\text{13.4 cu. ft. Cylinder vol.}} = \text{5.6 lbs./cu. ft.}$$

Normally the capacity of the washer-extractor should be approximately 5.6 pounds or less of dry weight textiles per cubic foot of cylinder capacity. The higher this number, the less room textiles have for mechanical action; the smaller this number, the more room. It is essential for comparative purposes to establish an acceptable standard.

The standard is 5.6 pounds of textiles per cubic foot of cylinder volume or less.

This applies to those items which can be loaded at 100% of the machine's rated capacity. There are, however, some items which should be loaded at a rate of only 75-80% of rated capacity: permanent press textiles which are not to be ironed, heavily soiled textiles, and stained loads.

Work in these categories should be loaded at a rate of 4.2 to 4.5 pounds of dry textiles per cubic foot of cylinder capacity. This reduces the likelihood of wrinkles caused by the weight of the textiles themselves.

LOADING FACTORS:

Degree of soil	**All Cotton** lbs/cu. ft.	**Polyester/Blend** lbs/cu.ft.
Light	5.6 - 5.5	4.5 - 4.2
Medium-Heavy	4.5 - 4.2	same
Stain removal	4.0 - 3.7	same

The reasons for underloading heavily soiled and stained loads is to increase the mechanical action, provide more washing liqueur, decrease the concentration of soil and reduce the likelihood of soil redeposition. When underloading the washer-extractor, it is best to limit the size of one pocket to 70 % or less in the washer. In other words, a two-pocket 200 lb. washer/extractor should have no more than 70 lbs of textiles in each pocket.

Some inexperienced laundry managers believe that underloading normally soiled textiles will improve the quality of the wash. It will not. The only result of such underloading is to increase the use of water, labor and production time. The prescribed wash formula will wash normally soiled loads as clean as possible when loaded to a ratio of 5.6 lbs. per cubic foot. Loads below this ration except as indicated, gain nothing whatever and waste time, chemicals and labor.

III. WASH FORMULAS

A wash formula consists of a series of chemical solutions used at different water temperatures which allow maximum benefit from the chemicals placed into the wash wheel. A formula surplus or deficit at any point of the cycle will have a disproportionately negative effect on the quality of the product. The wash formula controls three of the four conditions which are required for good results. These conditions are:

1. Mechanical action
2. Water levels
3. Time
4. Temperature, Chemical action

A. **Mechanical action** is determined by the amount of textiles placed in the wash wheel. Time, temperature, and chemical injections are controlled by the formula, which is developed for each type of wash load. In some hotels chemicals are hand-added, but even then the water level set in each formula determines the chemical concentration and mechanical action. Therefore, the wash formula is a major responsibility of the laundry manager; once it is set it should not be changed unless there are clearly defined problems with the formula.

If a wash formula which has produced good quality work for an extended period of time suddenly shows deterioration in quality, the problem is not with the formula, but with one of the other functions such as utilities, chemicals, or machine operation. When wash formulas have been developed which meet all of the criteria, they should not be altered.

B. **Water Levels**
Water level in a wash formula should be measured from the bottom of the wash cylinder to its height on the door while the machine is in motion with a full load. Wash levels should never be set when the wash cylinder is stationary or unloaded. In side loading machines, a water level gauge or standpipe will be necessary to ascertain the water level. No chemicals should ever be added to a wash wheel until the proper water level has been attained. Three water levels are required on each washer/extractor.

1. Low level - 2 to 3 inches for starching
2. Medium level - 6 to 8 inches for washing
3. High level - 10 to 14 inches for rinsing

Actual inches may vary by machine -- see manufacturer's recommendation.

Machines which have only one water level force a compromise on each step within the wash formula. In most cases, these washer/extractors are of a light weight and do not meet the criteria for extraction G force and/or the ratio of capacity to net machine weight.

C. **Formula Times** - Several factors bear directly on the total run time of a wash formula for a given classification of work: availability of water, the method of heating water, the condition of the water, and the availability of steam. The acceptable range of washing time can be set as follows:

	Washers Extractors
Uniforms - non-iron	25 - 33 min.
Iron type Flatwork	30 - 35 min.
Iron type Napery	35 - 40 min.
Iron type Uniforms	35 - 40 min.
Terry Toweling	31 - 37 min.
Rags	31 - 40 min.
Rewash and Stain	35 - 43 min.

4.4.6

If the formula require more time than indicated by this chart, there are two likely causes:

1. The chemicals being used are of poor quality or improper quantities are being injected.
2. Utilities, including steam, water and/or hot water, may be insufficient to provide adequate cleaning.

The times on the chart are the actual times the timer is moving; they do not include time required for filling or for internal water heating while the timer is stopped. Therefore, when your formula card is examined the total of the minutes column on the program card should fall within this range. Extraction time is included.

If your wash formulas fall below the standards given in this chart, quality may eventually suffer. If they exceed the range, they could **significantly reduce textile life**. It is essential to know formula times in order to determine the number of loads which each washing machine can handle. Failure to fall within this formula range will result in excess equipment, overtime, or quality problems.

All full dry items such as terrycloth toweling and rags should be extracted for a minimum of 6 - 8 minutes. This should reduce the moisture level to approximately 50% of dry weight. Approximately 2,500 BTU's (or 2,637,000 Joules) of heat energy are required to evaporate one pound of water in a dryer or through an ironer. Failure to remove moisture in the washer/extractor during the extraction cycle causes extreme waste of energy when the item is dried or ironed. Heavily soiled items will require some additional time but soil removal will depend upon the chemical concentration and the temperature during the wash cycle.

For your guidance our standard formulas are attached. If your current formulas vary considerably - please discuss this with your chemical vendor and have him make the required adjustments.

NOTE:

The following wash formula has been developed by our hotel. Our current supplier of Wash Room chemicals, Diversey Fabrilief, is guaranteeing us a fixed price based on these formulae.

Since we might decide at a later date to change suppliers, the amount and chemicals supplied at each of the stages could change, since a different supplier might use different concentrations of the product.

In order to interpret the chemicals on a more generic level, please remember the following kep and keep in mind that the amounts used are based on the current concentration of products used:

LIQUID

EDGE	=	DETERGENT
CONCLUDE PLUS	=	SOUR
VALID	=	SOFT
KLORGON	=	ANTICHLORE
EMPHASIZE	=	STARCH, SYNTHETIC
ASSIST	=	ALKALI

Please insert Wash formulas here.

D. Temperature

Factors which determine the wash formula are: temperature, water levels, and time. Over 85% of textiles can be processed at 140° Fahrenheit or less. This is why all hot water supplied to the laundry should be 140° Fahrenheit and all washers should be provided with automatically controlled live steam injection. Soiled textile classifications which require temperatures above 140° Fahrenheit (in the range of 160° Fahrenheit - 180° Fahrenheit) are:

1. Heavy soil
2. Grease in kitchen rags
3. Kitchen Uniforms
4. Stained textiles

Classifications which require temperatures below 140° Fahrenheit are:

5. Non-color fast dyed items
6. Plastic products
7. Shower curtains
8. Some guest work

The following recommendations should be followed closely:

- Table napery should be given a lukewarm, 120° Fahrenheit to 130° Fahrenheit, suds or flush in the initial operation to facilitate removal of fruit stains, blood and albumen deposits. In the subsequent operation, the temperature should be increased to the appropriate temperature for the work classification.

- **Never** introduce chlorine bleach into the wash wheel when the temperature of the bath is over 160° Fahrenheit or when live steam is being injected into the wash wheel. Chlorine Bleach injected in these situations will cause pinholing and excessive tensile strength loss.

- A split of hot and cold water may be used for the final rinse on bath towels. This may improve the extraction and decrease the drying time in the tumblers.

COMMENT: Equipment specifications should require that all washer-extractors be able to inject live steam into the washer-extractor. Even with live steam injection, hot water (140° Fahrenheit) is must be supplied to the washer-extractor.

If only cold water is supplied; excessive use of steam, extended wash formulas and inefficient use of chemicals will result. Cold water washing will (could) cause textile greying and other quality problems. COLD WATER WASHING IS NOT RECOMMENDED UNLESS REQUIRED BY TYPE OF FABRIC.

IV. WASHROOM FUNCTION SEQUENCE

It is important to emphasize the sequence to be followed if consistent production is to be achieved. Practically all laundry operations which do not achieve the very conservative requirement of 1.2 loads per machine per hour fail to follow the procedures outlined here and to use a production sheet.

At the end of the day the washman, who stays one hour after the production crew leaves, should unload work-in-progress and reload all washers for the next day. He should then arrange a second sorted load for each washer in carts in the soil sort room.

No-iron textiles **must not** be left unfolded overnight. This is discussed further in the dryer section.

CHRONOLOGICAL SEQUENCE:

1. Start washer.
2. Aid sorter in preparing future loads.
3. Unload washers.
4. Reload washers and start them.
5. Start dryers.
6. Repeat steps 2-4 if large laundry or steps 2-5 if small laundry.
7. Stop washing non-irons 1 1/2 to 2 hours before production crew finishes its shift.
8. During the final 1 1/2 to 2 hours concentrate on producing rags, full dry (terry), and other items which will not be harmed by standing dry and unfolded overnight.
9. Load washers for next morning.
10. Prepare second washer round for the next morning in soil sort area.

11. Turn in production sheet for each washer to supervisor.

NOTE: Normally uniforms should be the first and last completely processed loads of the day. The last load is the last load to be **fully** processed and folded. The final **wash** load through the washers should be rags accumulated during the day, provided there is sufficient time to completely dry them, followed by a 15 minute cool down cycle. This process has to be carried out under supervision. If this can not be assured, rags should be washed during the day while proper supervision is available.

Chapter 5
IRONING

INTRODUCTION

Many variable factors, aside from the ironer's rated capacity, affect the machine's production capacity.

Variable Factors:

- the type of articles,
- thickness of the fabric,
- water retention,
- Method of feeding the material into the ironer.

Physical Factors:

- The human factor is the variable.

Looking at the initial cost, the utility usage and the upkeep, the ironer is one of the most expensive pieces of laundry equipment in a conventional laundry. It is designed to function for many years if proper maintenance is provided.

Most hotel laundries use a single ironer. This section addresses those operations. Multiple iron plants can utilize most of the data, but division of work will vary. Single ironer plants must use the ironer for small pieces and large piece items. It is necessary therefore, to provide a system with the flexibility to produce all items which require ironing.

Note: The ironer capacity is a restricting factor in an iron-type laundry. Efficient use of the ironer will determine the efficiency of the conventional laundry.

FLAT TEXTILE IRONING, FOLDING AND STACKING

The purpose of ironing is to completely dry and give a smooth wrinkle-free finish to flat textiles. Items are then folded and stacked in a designated manner for uniform appearance, easier handling and easier storage.

Ironers are usually 120" in width and have one, two and up to twelve rolls. As more executive types of linens are being used throughout the hotels with lengths exceeding 120" ironers to be purchased must have 130" working width. These ironers may also be used to process all cotton or cotton blend fabrics. The feed speeds commonly are as high as 150 ft. per minute. Ironers accommodate many sizes of textiles at various speeds, consistent with proper drying.

It is possible to equip ironers with a variety of feeding aids for increasing production and improving quality. For large pieces, there are spreaders and feeders to open up the pieces. Air suction or mechanical devices assist the feeders in smoothing the piece. Air suction devices can also help straighten small pieces by holding them taut as they are drawn into the ironer rolls.

It is possible to attach folders and crossfolders to ironers for improved quality and productivity. Use mechanical folders and stackers to handle small pieces.

The speed through which textiles can pass through an ironer and still be properly finished governs ironing capacity. There are two limiting factors: 1) the rate at which operators can feed the textile into the ironer; and 2) the capacity of the ironer to completely dry the textile. Since the ironer must completely dry each item passing through it, the moisture content of input, ironer speed, roll pressure and chest temperature have important bearings on ironer output. Usually, the ironer speed is set to completely dry the item, yet taken away fast enough to permit the operations to feed another piece with no waiting time.

A feeder places small pieces one at a time through the ironer from a feed trough or cart. Most ironer feed troughs maintain the work at a convenient feeding level through the use of a spring bottom or an inner liner roll up device. Typically, feed troughs are manually loaded from carts. Some laundries use slings which dump onto a belt conveyer which carries the work to the feeders. Items coming out of the ironer are folded and stacked, either manually or automatically by machine. A stacker operator verifies the counts, and prepares the textiles for distribution.

It is necessary to include and account for times for intermittent productive operations such as replacing or refilling the feed troughs in measuring the ironers output.

PHYSICAL REQUIREMENTS

I. CALCULATION IRONER PRODUCTION CAPACITY

Before determining ironer capacity, three factors must be known: steam pressure, steam quantity, and the moisture retention of the sheets to be ironed.

A. Steam Pressure and Quantity

Each ironer requires a specific volume of steam at a given pressure to operate at full efficiency. Practically without exception ironers should be supplied with the maximum volume of steam requirements at 150 pounds per square inch (under no circumstances less than 100 pounds per square inch). All power plants must be designed to supply these needs. Failure to meet these standards will directly and proportionately decrease the ironer's capacity. Since the ironer is an expensive piece of equipment which uses a lot of labor it is essential that it be capable of operating to its maximum capacity.

B. Fabric Moisture Retention

The amount of moisture left in the fabric to be ironed will determine the speed with which that fabric can be processed. Unconditioned sheets should have retained moisture of 55% to 45%; conditioned sheets can be dried to 30% moisture retention. Moisture retention is determined as follows:

$$R\% = \frac{\text{Extracted Weight - Dry Weight}}{\text{Dry Weight}} \times 100$$

Moisture retention is affected by three factors.

1. **Type of fabric:** Polyester/cotton sheeting fabric will have lower moisture retention than all-cotton sheeting fabric at the same extraction "g" force. Therefore it should be used whenever possible because in addition to the other benefits received from polyester/cotton sheeting fabric, it can be ironed significantly faster given the same circumstances than all cotton fabrics.

2. **Extraction:** If the extraction force of 220 G's is available, extraction will not be a major problem. Laundries whose washer/extractors have a very low extraction "G" force must have a larger ironer or must condition the items. This will take extra time, personnel and drying equipment.

3. **Conditioning:** If items to be ironed are also to be preconditioned in a dryer (to reduce moisture retention to 30%), the ironer operating speed can be increased, increasing the ironer's capacity.

NOTE: It is not normal practice in most hotel laundries to condition flatwork except for (sometimes) pillow cases and napery.

II. SPACE

The space required for the ironer operation depends upon the size of the ironer selected, volume of work, and work flow. At least 2.85 to 3.5 square feet per pound of textiles processed per hour will be

required for a single ironer plant. If a larger ironer is installed in a relatively small hotel this space requirement could increase to as much as 4.0 square feet per pound per hour.

Normally, a single ironer laundry for a business hotel requires 3.5 square feet per pound of textiles required per hour of laundry operating space.

III. VENTILATION

There must be 30 to 60 air changes per hour in the ironer area. This can be achieved by the use of a canopy over the ironer and supplemental exhaust in-takes in close proximity to the operator areas.

IV. LIGHTING

100 foot candles of illumination should be provided over both the feed and receiving ends of the ironer. It should be arranged to eliminate shadows so that operators can inspect the material as it is handled.

V. CEILING

If a canopy is not used over the ironer the ceiling covering will be subjected to steam vapors. It will be, therefore, necessary to use a ceiling covering which will withstand moisture without warping.

If a canopy is used over the ironer, any type of ceiling covering which will prevent lint from accumulating and which will withstand temperatures of up to 180° Fahrenheit can be utilized; moisture should not be a major factor.

VI. FLOORING

When sheets are fed into an ironer they will drag on the floor. It is therefore essential that the floor at both the feeding and receiving ends of the ironer be tiled. The tile should withstand moisture, heat and heavy traffic. Under the ironer tiling is not necessary since grease, oil, water and wax build-ups will occur. This area should be concrete and sealed with a hard concrete floor sealer.

VII. UTILITY USAGE

Four types of energy are used to heat ironers. They are, in order of frequency of use: steam, gas, oil, and electricity.

A. Steam

Most ironers are heated by steam. Calculations for piping and boiler sizing should be based upon the manufacturer's recommendation furnished with individual ironers at the time of purchase. To insure that proper pipes and fittings are installed, all traps and steam piping to the main connection should be supplied by the manufacturer when the steam iron is purchased.

It takes approximately 1,842 BTUs to evaporate one pound of water in a properly covered ironer; a poorly covered ironer may require as much as 2,672 BTUs to do the same. Actual steam

usage depends upon the steam pressure and volume provided the condition and type of padding on the ironer, moisture retention of the material, type of material being fed, and efficient use by the operator.

B. Gas

Gas ironers are mainly used in cylinder type ironers. A flame inside the rotating cylinder heats the fabric to evaporate the moisture. Cylinder type ironers are most advantageous for hotels under 300 rooms. The type of gas to be used must be determined when selecting an ironer. This selection will bear directly upon its capacity unless the ironer is adjusted for the specific type of gas.

C. Oil

Under normal circumstances oil is more efficient and less expensive than any of the three preceding fuels. Oil heated ironers are widely used because of the energy efficiency. Oil heated ironers should be considered where steam is unavailable or insufficient and where fuel used for generating steam is extremely expensive.

D. Electricity

Electrically heated ironers are mainly the cylinder type. These ironers are expensive to operate and less efficient than either steam or gas.

EQUIPMENT SPECIFICATIONS

I. IRONER SELECTION

A. Ironer Selection by Hotel Size

0 - 300 rooms	-	32" x 130" cylinder (gas) or one 32" roll chest ironer, steam, or oil heated. 30 - 125 fpm range. A gas heated, single roll ironer with a 32" or larger roll is sometimes used where unique circumstances are encountered.
300 - 400 rooms	-	36" x 130" cylinder (gas) or two 32" roll chest ironer, steam or oil heated. A gas ironer is not normally used for this size hotel, unless the laundry operates at least two shifts.
400 - 700 rooms	-	36” x 130” cylinder 3 roll 4 steam or 2 roll oil heated chest ironer with 30 fpm to 150 fpm range.
600 - 900 rooms	-	36” x 130” cylinder 3 roll to 4 roll steam or 3 roll oil heated chest ironer with 30 fpm to 150 fpm range.

B. Ironer Selection by Fuel Type

Steam is the most widely used heat source for ironers. It is efficient, economical, and its operation is widely understood. For hotels over 300 rooms and with all other factors being equal:

> A 120" roll steam ironer is normally selected over all other types of ironer. The number of ironer rolls depends on the hotel size (work load).

Thermal Oil is the alternate to steam for larger laundry operations. It requires less production equipment, is purported to be more efficient and operates at a higher temperature than normal steam ironers.

If steam is not convenient in a hotel, thermal oil is the next preferred fuel source for larger hotels (300 beds or larger). Some properties have situations which make installing steam boilers and their trim too expensive, then:

Thermal Oil Systems are the next choice. They are less understood than steam, parts for maintaining the system are not as accessible, and there is a possibility of damaging textiles due to excessive heat. However, when operated properly, they are very efficient and productive units.

Gas Ironers are very popular for the smaller hotels. For business hotels under 300 rooms they have filled a need. They are normally used when:

- For business hotels under 300 rooms
- There is minimal flue access to the atmosphere
- Space is extremely limited
- A stationary (steam) engineer must be avoided
- Capitol investment must be limited
- Natural gas is not available.

Electric Ironers should never be used for a hotel laundry over 50 rooms except in extreme and unique circumstances.

II. SHEET FOLDERS

Many types of folders are on the market today, one appropriate for every size laundry. The degree of automation required is dictated by labor costs and technical services available in a particular locale. Sheet folders also fold most table cloths.

A. No Sheet Folder

Properties smaller than 167 rooms (using 12 lbs/room) operating on a 40 hour laundry work week will process a maximum of 350 pounds per hour, approximately half of which will be sheets and pillowcases. As a result, not more than 150 sheets will need to be folded in any one hour of operation. Two employees can comfortably fold these sheets in one hour. The only purpose of a folding device in this size operation is to allow one employee to work

independently while the other operator is occupied with another task. The second operator and sheet folding device will still be required to work on sheets during this hour, but it will be unnecessary for the operator to coordinate sheet-folding time with the other employees.

B. Automatic Sheet Folders
Weigh in excess of 2,000 pounds and are designed for extended heavy-duty use. They range in sophistication from a simple primary folder to a folder-cross-folder stacker with a grading device. Plug-in modular solid state circuitry is advantageous in remote locations.

The following types are available:

1. The primary folder folds the length or warp of the sheet in half twice. An operator then must make the desired number of cross folds.

2. The primary folder with lanes folds both sheets and little pieces.

   a) Two lane folders allow two lanes of tablecloths (up to 54" wide) to be fed at one time. They also allow four lanes of little pieces (pillowcases, etc.) to be fed if the two operators on a single lane feed their pillowcases at exactly the same time. This slows production somewhat but is more effective than hand-folding.

   b) Four lane folders can also be used as primary, two lane or four lane units. The only advantage of the four lane over the two lane is that operators feeding napkins or pillowcases, etc. need not feed their lanes in unison.

3. The folder-cross-folder is a sheet folder that will make two or three primary folds and two or three cross folds automatically, ejecting a folded sheet to an operator. This unit is recommended where labor is scarce or expensive since it reduces the folder crew for sheets and napery from 4 to 3, excluding preparers in large operations. This type of equipment is in use in most of our hotels.

III. STACKERS

A. Sheet Stacker
This is an optional piece of equipment which can be attached to a folder-cross-folder. It was designed primarily for larger operations. It allows the folder operator to perform added operations and/or perform closer inspection. While smaller operations can operate without it, operations over 300 rooms will benefit from its use.

B. Small Piece Stacker
The small piece stacker attaches to the back or the top of a sheet folder. It is designed for medium to large laundries so that small pieces (napkins, pillowcases, etc.) can be stacked for manual folding or automatic folding on a towel folder. This unit is very beneficial for large hotels, since one operator can receive four to five lanes of little pieces with ease; this reduces staff requirements.

Normally, a hotel would not purchase a little piece stacker unless it had at least 500 rooms or a high room occupancy/or very heavy F&B usage.

C. Static Eliminators
All sheet folders should have static eliminators. This prevents the items from "flying" or adhering to the belts and causing the folder to jam. Recently, folder anti-static belts have become available and should be used whenever possible.

D. Quality Controls
A desirable option for most industrial folders is a quality-control device which automatically separates stained and torn items from good textiles. If the folder is attached to a large ironer, this device is very helpful, since distance and noise shut off communications between operators.

NOTE: Whenever the folder is used to process sheets, a clipper lacing machine, resin, and gut laces must be kept on hand for repair. These items are inexpensive and can be purchased from your equipment supplier.

All new ironers should be purchased as follows:

- Padded and with spare aprons (if necessary)
- Traps and piping
- Vacuum exhaust if available
- Sized to work load (and expansion)
- Extra ironer tapes and feed ribbon
- Ironer wax (if not available locally)
- It is also advisable to order a clipper lacer, lacings, dope and pins
- Should have counters on each lane and a counter for sheet (primary) folder
- Cleaner cloth and cleaner
- Fully installed by supplier and checked out by same
- One year repair and parts guarantee.

IV. FEED ASSIST DEVICES

A. **Vacuum**
A vacuum unit may be installed on the front of some ironers to help spread the sheet as it is fed into the ironer. This device is a feeding aid and will not add to the productive capability of the ironer. Its main advantages are that it will somewhat reduce the likelihood of the sheets touching the floor as they are fed into the ironer.

V. FEEDERS

Feeders are the pieces of equipment which will, after the sheet is placed in clamps, deliver the sheet to the ironer and feed it directly into the ironer without operator assistance. These units come in various styles. It is recommended for hotels with 500 rooms or more.

VI. CANOPIES

Canopies are included as an integral part of most cylinder type ironers. On steam ironers canopies are essential to remove the steam emitted from the work area. Care must be taken to check the available height above the ironer to be sure that standard canopy will fit. If it won't a homemade type canopy can be installed. Oil heated ironers always require canopies.

VII. IRONER TRUCKS

The decision whether to purchase special trucks for the ironer depends upon the system of feeding used in a particular laundry. Special trucks are needed only if operators are required to feed directly from the trucks into the ironer. Thus, if a spreader is used for sheets and little pieces are shake-fed from the trough, special trucks are not required.

PROCEDURES

I. SEQUENCE

A. Sorting

Work should be sorted according to the techniques to be used in their processing. Sheets, pillowcases and other small items should be sorted, washed, and conditioned (if necessary) separately so that work received at the ironer will be in groupings while corresponding to ironing requirements.

B. Washing

Care in washing to control sour and extraction is necessary to allow efficient ironing. A pH level of under 6 may lead to rolling, jamming the ironer and possibly damaging inner padding. Insufficient extraction will leave too much water in the textiles (too high moisture retention). This will also cause rolling; damp textiles after ironing (double passing) or poor finish quality.

Other causes of rolling of textiles in an ironer can be identified by checking the tightness of the roll. A very tight "rope" will probably be caused by the use of too much sour. A loose roll is probably caused by too much moisture left in the sheets.

Too much sour or improper rinsing will cause "browning" of the goods.

To cure these conditions, rewash and extract while checking sour quantity used and extracting to approximately 35%-45% moisture retention. Then re-iron.

Another cause of textile rolling could be the failure to wax the ironer.

C. **Conditioning**

Conditioning of work to be ironed is accomplished by removing moisture in a drying tumbler (dryer). The reasons for conditioning are:

- Poor extraction - a washer may not meet the 220 G force minimum requirement for extraction equipment.
- Too short an extraction cycle for the items ironed.
- The need for higher production rate (speed) of ironer.
- To eliminate multiple passes of work through an insufficient or inefficient ironer.
- To compensate for low ironing temperatures (low steam pressure) a steam pressure of 114 psi to 125 psi is standard.

Normally pillowcases and napery should be conditioned for 4 to 8 minutes to allow efficient ironing speeds.

D. **Shaking Out**

Shaking Out is the preparation of work to be ironed by laying it out to facilitate ironer production.

1. **Sheets:** Cotton sheets almost always require shake out preparation, because the lubricity of wet all cotton sheets is quite low and they will tend to "knot". While polyester/cotton blend sheets, for hotels under 200 rooms seldom need shaking out, they can be picked out of the cart by the feeders and fed.

2. **Small Pieces:** Napkins, pillow cases, etc., should never be pre-shaken. The feeders should feed directly from the ironer feed carts or from the feed trough. Aprons are exceptions to this rule. Because of the strings or ties, aprons should be shaken out (laid out) for feeding.

E. **Feeding**

Feeding is the act of placing the item into the ironer.

Sheets

- 2 feeders grasp the sheet in one hand and place one corner onto the feed ribbon;
- with the other hand, they feed and pull the other end of the sheet toward the ironer;
- feeders pick up trailing edge with same hand used to feed and drape sheet in front of the ironer smoothing with feed hand;
- the other hand then reaches for the next sheet.

Small Pieces Feed small pieces from feed trough without pre-shaking.

- Normally, on a 120" ironer 4 feeders and 2 receivers are used.

- Always use entire ironer capacity.
- If a little piece accumulating stacker is used, there can be 4 or 5 feeders and 1 receiver, depending on the size of the machine.

Aprons should be shaken out so that they can be placed (in stacks) across the feed trough bar. This is necessary so that ties can be laid across the body of the fabric to avoid tangles in the folder.

II. HANDLING POLYESTER BLEND SHEETS

A. Ironing

After extraction, the water content of polyester and cotton blend sheets will be, perhaps, about 30% to 35% of the dry weight of the sheets. Actual water content depends upon several factors but primarily upon extraction efficiency. This implies that about 4 gallons of water 33 lbs. is removed per 100 pounds of dry sheets during ironing. By way of contrast, all cotton sheets may retain about 6.5 gallons of water per 100 pounds dry weight. Obviously, blend sheets will iron faster than all cotton sheets. Unfortunately, the rapid drying of blend sheets also leads to overheating and consequent damage to the sheets in some cases.

The principal damage to blend sheets in overheating occurs through thermal contraction and even fusion of polyester fibers. Polyester fibers begin to contract significantly when heated above 360° Fahrenheit in a relaxed state. Contraction increases rapidly as fiber temperature increases and appears to occur almost instantaneously to a casual observer at an ironer. Actually, some small amount of time is required for contraction and, as a result, progressive contraction will occur with repetitive excessive heating. The result is high shrinkage which progresses as the number of times of excessive heating in ironing increases.

Normally sheets are fed into ironers with a selvage leading. Tension is applied only across the width of the sheet. There is no tension along the length of the sheet and it is free to relax and contract. Highest shrinkage, therefore, generally occurs in the length of the sheet. In extreme cases, the polyester fibers contract to a coiled and entangled configuration. When such occurs, the fabric shrinks appreciably and becomes very stretchy or even rubbery.

Hot oil (thermal oil) ironers are sometimes operated at oil temperatures in excess of 400° Fahrenheit. A rationale for the use of such high oil temperatures is to provide a large temperature differential above the boiling point of water, 212° Fahrenheit, and thereby increase the rate of drying and ironer production. It works thermodynamically and in practice.

The danger is that the temperature of the sheet rises rapidly when completely dried. The specific heat, or energy required for heating of polyester fiber is very low. Therefore, the temperature of the polyester in a blend sheet virtually jumps to the temperature of the ironer chest surface when the fabric is dried. Excessive chest temperatures lead to excessive fabric temperatures.

The solution to thermal shrinkage in blend sheets on hot oil ironers is apparent:

1) Don't over-dry;

2) Reduce oil temperature.

Actually, of course, the two go hand in hand. One ready check of fabric temperatures in ironing is provided with the use of **temperature indicator papers** from: **The Paper Thermometer Company,** http://www.mv.com/ipusers/paperthermometer/pages/intro.html A way to monitor moisture content in ironed sheets is with a **fabric moisture monitor** as supplied by **Strandberg Engineering Laboratories,**. http://www.strandberg.com/ Such controls do not necessarily imply loss of production or reduced ironer throughput.

Controlled ironing temperature and conditions may also provide such ancillary benefits as reduced static generation, lower ambient working temperature, increased life of sheets and lower fuel costs.

I. STATIC ELECTRICITY

Fabrics create most static electricity, but polyester/cotton sheets are especially prone to this problem under conditions of low relative humidity. There are several methods of overcoming static electricity.

It is first necessary, determine that static actually cause by static. There are some other conditions, appearing to be static, which would cause polyester/cottons to fail in the folding process either by misfolding or jamming. These include:

- **Air movement:** A large volume of air introduced into and/or extracted from the laundry area could cause light, delicate polyester/cotton fabrics to fly off the ironer chest or folder ribbons and appear to be "static". There is no way to distinguish between these two phenomena visually, it will be necessary to run some of these sheets through the ironer with the ventilation system turned off so that the exact cause can be pinpointed. If it is found that the air movement, either input or exhaust is the cause of the problem, shielding the area around the folder and possibly changing the direction of some vents and intakes could resolve this situation with a minimum of expense.

- **Worn-out sheets:** If the only sheets which are flying off the ironer (before they reach the folder) are polyester/cotton sheets which have lost their cotton content, static could well combine with the light weight of the fabric to cause this problem. Remember, polyester/cotton sheets will not wear out by tearing but rather will lose their cotton

content and leave a 100% polyester cheesecloth fabric. Other situations which would indicate worn-out sheets are photocells on the folder failing to consistently perform (reading through the sheet) and low sheet replacement levels (Keeping worn-out sheets in service).

- **Ironer problem:** It is unlikely that static is the cause if the problem occurs in the ironer itself. Therefore, if the problem occurs in the ironer, possible causes might be:

  - A dirty ironer chest
  - Poor chest lubrication
  - Excessive moisture in the sheets when they are ironed
  - Excessive souring in the last rinse
  - Too few ironer tapes being used
  - Faulty steam traps
  - Too low steam pressure

If static is the problem there are several steps which can be taken:

- check to determine if the static eliminator on the sheet folder is operating properly.
- The folder may be running at a higher rate of speed than the ironer. The folder should be set to operate 25 fpm faster than the maximum fpm of the ironer. If 100 fpm is the ironer's maximum speed, the folder should be set at 125 fpm. There are currently folders which monitor the ironers speed and adjust the folders speed accordingly. These should be used whenever possible.
- Some ironer waxes will reduce the static effect of the ironer. This wax should be used on the ironer regardless of the fabric.
- Use fabric softener in the final rinse water when processing sheets and pillowcases. Fabric softeners are by their very nature anti-static since they lubricate the yarn, and so reduce friction.
- Folder belting with anti-static capacity built in is now available and should be used whenever possible.

If static is the problem the following recommendations are listed in order or priority:

1. Remove the exhausted polyester/cotton sheets from service.
2. Make sure anti-static fabric softener is introduced into the final rinse water for sheets and pillowcases.
3. Make sure that the folder has a properly functioning static eliminator.
4. Run the ironer for 15 minutes (processing sheets) without introducing any laundry exhaust or make-up air into the area. This does not include the ironer canopy.

5. Make sure your ironer wax is an anti-static type and that the ironer is waxed at least four times during the day: first thing in the morning, morning break, lunch and afternoon break.

6. Install antistatic folder belts on your sheet folder.

Abnormal Work Signals	Probable Cause	Cure
Partial rolling of leading flatwork on chest causing poor quality and possible damage to covers and padding.	Improper alignment of chest.	Check delivery edge and make certain edge of chest is slightly above receiving edge of the next chest.
Flatwork not drying properly, causing wet work which reduces production since operator is forced to slow down the ironer.	Vacuum system not working properly.	Check vent pipes of system. Cold pipe indicates which vacuum fan is not working. Clean pipes and repair fan if necessary.
Flatwork not drying properly at high speeds. Operator is forced to slow speed and reduce production.	Roll diameter is below requirement, reducing ironing surface of ironer loads.	Replace ironer padding or use booster pads.
Improper travel of flatwork due to friction caused by excess deposit of residue on chest. Chest can actually be soured by too much sour, as sour is composed of fluoric acid which is used to cut glass. Leading edge of work will roll in chest causing very poor quality.	Flatwork is over soured or sour in wash load is not distributed properly or rinsed properly.	Clean ironer with steel wool cleaning cloth. Check the sour of each load in washroom before load is pulled. Sour batch should run at least 5 min. to get proper distribution.
Buildup of wax on chest, thus causing improper ironer travel which affects quality.	Over-waxing of ironer chest.	Use wax sparingly. Set up daily chest cleaning program in writing for all ironers. Wax in a.m. when starting, wax at lunch time, and follow with cleaning cloth each time.

Abnormal Work Signals	Probable Cause	Cure
Work may turn brown (due to reaction of residual alkali in merchandise to the heat of ironer chest).	Flatwork undersoured.	Check content of final rinse, and add more sour if needed, being careful not to over sour. See that all work is rinsed properly and all the way through. Quite often no sour is used on sheets, but proper rinsing must be maintained throughout.
Residue of starch buildup on iron chest and rolls causing poor travel of flatwork and poor quality.	Improper starch penetration of merchandise in wash wheel.	Use as little as possible. When starch is used, make sure the starch is thoroughly distributed. Use a lubricant with the starch.
Malfunction of folders, causing poor quality fold and/or jammed folders.	Flatwork folder is dirty and clogged with lint.	Set up program for each folder to be blown out and cleaned twice each shift. Treat each folder ribbon to eliminate lint felting, causing ribbon to slip.
Soft ripples or wrinkles in flatwork merchandise, and improper folding due to static electricity.	Aprons not running at same speed, causing friction and static electricity.	Check all bearings in apron drive and guide rolls. Paint drive rolls to eliminate slipping. Ground ironer to water or drain pipe.
Reduction of life of ironer padding, and possible rolling of flatwork.	Too much pressure on ironer.	Only qualified personnel, such as manager or assistant manager, should set ironer to pressure each day.

Abnormal Work Signals	Probable Cause	Cure
Scalloping of turning edge of flatwork causing poor quality.	Ironer tapes installed too tightly.	Check for proper adjustment of ironer tapes. Move tape spools on ironer regularly to prevent wearing of chest in one place. Dacron tapes should be put on so they drape over chest, as heat will take them up.
Uneven result of large pieces of flatwork merchandising to first chest, causing poor quality leading edge of merchandise.	Ironer feed ribbons worn and slipping.	Replace feed ribbon or tighten tension.
Improper travel of flatwork and improper drying since only 50% of the roll is touching chest, plus slowing down production.	Misalignment of ironer rolls on chain-drive ironers, indicating bearing trouble.	Replace and/or realign bearings. (We have no chain-driven ironers in our plants).
Uneven delivery of large piece flatwork merchandise on first chest, causing poor quality leading edge of merchandise.	Warped feedboard.	Replace feedboard.

Abnormal Work Signals	Probable Cause	Cure
Poor quality of fold on jammed folder.	Static electricity to folder.	a) Over-soured flatwork merchandise. b) Work may be too dry. c) Check speed of aprons to be sure they are running at same speed. d) Install static eliminator bar if necessary. Please be sure folder is grounded to water or drain pipe (and that should be the first consideration).
Improper travel of merchandise causing poor quality of wet work. Operator must slow ironer speed, reducing production.	Flatwork merchandise is too wet.	Check extraction percent and conditioning of merchandise, and see that it comes up dry enough to iron.
Flatwork is rolling, improper drying or improper travel which all cause very poor quality and production.	Steam Ironer chest below 310° Fahrenheit. MUST BE 300° to 360° Fahrenheit. While Steam at 125 psi has a temperature of over 340°F. the ironer chest will be 20° to 40° cooler if measured with a pyrometer.	Check that operation of boiler is 125 psi. Check steam traps to insure all are working properly. Make sure all steam pipes from boiler to ironer are insulated. Check back pressure on traps. Check size of steam lines from boiler to ironer. Correct any of above, or all if necessary

Abnormal Work Signals	Probable Cause	Cure
Deposit or residue of residual alkali on ironer chest, increasing friction and causing improper travel.	Improper rinsing of flatwork.	Check washers and increase rinsing time of wash formulas if necessary. Clean ironer chest to remove residue.
Wet work and improper flatwork travel, causing poor quality.	Warm-up time for ironer is too short at start up in the morning.	Every ironer should be warmed up for a minimum of 45 minutes before use. Rolls should be turning to warm up all surfaces, but make sure pressure is not fully applied to eliminate covered padding wear. A good way for warm up is to have a bypass line to turn on so ironer can warm up gradually.
Uneven delivery of large piece flatwork to first chest, causing poor quality.	Uneven pull on finger roll.	Replace covering on finger rolls so that it is even across the entire width of finger roll.
Poor quality due to uneven hem edges; the edges are folded and pressed down.	Feeding operator is not stripping edges of large piece flatwork.	Proper training and supervision of ironing personnel. Strip feeder edges at least halfway.

It is mandatory to have proper training and supervision of ironer personnel.

- Hotels with only one ironer should select a unit which has at least a 32" diameter roll. Use a four lane feeder.
- Hotels with 650 rooms or more are well served with a second ironer.
- At 800 rooms, the second ironer is mandatory.

Use the number of rooms per hotel as a general guide. It is not absolute since the number of hours that a hotel laundry operates may vary dramatically and the type of hotel/F&B service will impact on the number of ironers required. The safest guide is:

If the lbs./hr. at 100% occupancy exceed 1,600, (960 lbs. flatwork = 60%), the hotel requires two ironers.

Chapter 6
FUNCTION OF THE DRYING AREA

The purposes of drying are to remove additional moisture after extracting, and to separate tangled textiles for easier handling.

Basically a dryer or tumbler consists of a heavy perforated cage or drum that revolves within an enclosure. Moisture is removed by blowing heated air through the perforating and then through and around the textiles. The circulating air in tumblers is heated by oil or gas-fired burners or by steam coils. Tumbler equipment comes in sizes ranging from under 50 lbs. capacity to 400 lbs. or greater. Pounds of textiles, while convenient, are not too accurate a measure of tumbler capacity. More accurate is the amount of inner space expressed in cubic feet, or the moisture removal capacity expressed as pounds of water per minute.

Tumblers can be loaded manually or with the aid of slings, roller tables or conveyors. They are unloaded manually or tilting the unit and dumping the contents into carts, slings or conveyors. Some tumblers allow textiles to be loaded on one side and unloaded on the other side. This may improve work flow, depending on space configuration.

A number of different dryers are available today, from 600 pound gas dryers used by large industrial plants to 8 pound home dryers used for very specific purposes (Laundromats, etc.) Most hotel laundries use dryers with capacities of from 35 to 400 pounds. These pieces of equipment have the capacity and flexibility to meet the needs of most properties.

The essential elements in the satisfactory operation of dryers are proper design of the installation and optimum dryer capacity. As with washer/extractors, successful use of dryers depends upon receiving a standard number of pounds per hour from each drying unit. It is essential that the laundry manager install dryer production sheets so that he can regularly evaluate the volume actually being processed through each dryer.

Most hotels of over 150 rooms should use 110-pound or 150-pound dryers (i.e., 44" x 42" or 50" x 42" dryers). This equipment will allow the flexibility to process the smallest loads while still having the capacity to handle those bulk items which should be dried at machine capacity.

Rule of Thumb: Each drying unit, should process at least 2 loads per hour.

PHYSICAL REQUIREMENTS

I. SIZING

The price difference between a 50-lb. reversing dryer and a 110-lb. reversing dryer is relatively small, and the larger dryer is well worth the extra cost. The larger the volume of the dryer cylinder the more room textiles will have to circulate and thus dry more quickly.

II. UTILITIES

The selection of the type fuel to be used -- electricity, steam, or gas -- must obviously first be made on the basis of availability. Economic considerations, however, are important. Using one therm (100,000 BTU's) as a base, we may calculate the equivalency of fuels as:

1 THERM = 100 cu. ft. of gas at 1,000 BTU's/cu. ft.
= 29.41 kilowatt hours at 3,400 BTU/KWH
= 1.087 gallons of propane (92,000 BTU's/gallon)
= .725 gallons of #2 oil (138,000 BTU's/gallon)
= 115.1 lbs. of steam at 869 BTU's/lb. (at 125 psi steam)

Check the rates of your local utilities to determine which will be most advantageous for your hotel.

Heat recirculation systems are another consideration. They are however only useful if they can be set to only spring into action if the condition of the air is right (temperature - humidity) if the system is not fully automated and requires manual control such a system causes more problems than it does good.

Please note that heat recirculation systems also extend the required drying time.

The operation of dryers can be calculated as follows:

RULE: It takes 2,500 BTU's to evaporate one pound of water in a dryer. So for each pound of water removed by extraction, 2,500 BTU's are saved.

If 100 lbs. of clothes contain 65% moisture, it will take 162,500 BTU's to dry them.

Then: a dryer with

80 KW (273,120 BTU/hr)	will dry	1.68 loads per hour
Natural gas (300,000 BTU/hr)	will dry	1.85 loads per hour
Steam (263,480 BTU/hr)	will dry	1.62 loads per hour

It can easily be seen that it is essential to purchase dryers with maximum fuel input and to extract as much moisture as practical in order to reduce the number of dryers to a minimum.

In Electricity, 80 KW are required (minimum).
In Gas, 250,000 BTU's per hour are required (minimum).
In Steam, 6 coils with 125 PSI are required (minimum).

This is absolutely essential to comfortably meet the standard of two loads per hour.

It must be understood, however, that even when these criteria are met, if the exhaust is restricted because of undersized ducts, clogged lint filers, or too long a run, air flow is reduced and drying times are increased. In addition, if the makeup air is cold because of air conditioning or outside temperatures, drying times will also increase.

Important Note: Electric dryers are not recommended in sizes above 20 lb. capacity due to cost of operation and maintenance.

III. PLACEMENT OF DRYERS AND INSTALLATION

It is more difficult than most designers think to locate dryers in the laundry. The ease of installation and minimum utility requirements has lead many designers to concentrate solely on work flow to dictate dryer location. However, doing so can create problems which will chronically haunt the operators.

Except for a large ironer in a conventional laundry, dryers are the greatest generators of heat in the laundry. Poor location will force radiated heat over the employees. Oversized cooling or ventilation systems must therefore be installed. Dryers must be thought of as heat radiators. Steps must be taken to keep this heat away from work areas, but it should not be wasted. It can be used to reduce energy requirements elsewhere. It should, for example, be contained in the dryer area for make-up air or exhausted to another area for heating purposes.

A. In the placement of dryers, the following should be considered:

- An outside wall is the preferable location.
- Dryers should be located close to where the exhaust exits the laundry.
- Air conditioner registers should be as far as possible from dryers and other heat-generating equipment.
- The exhaust flow, ideally, should exit the laundry near the dryers.
- Storage space must be left between the washers and dryers.

NOTE: GAS DRYERS MUST ABSOLUTELY NEVER BE LOCATED IN CLOSE PROXIMITY TO PERCHLOROETHYLENE DRYCLEANING MACHINES OR SOLVENT STORAGE AREAS. THE FUMES WHEN EXPOSED TO DIRECT HEAT PRODUCE AN EXTREMELY CORROSIVE GAS WHICH DESTROYS FABRIC.

B. Installation

- Dryers must be facaded to contain the heat and to supply tempered make-up air
- Proper duct size is essential
- Some exhaust behind the facade is necessary for electrical protection from high ambient heat.
- All ducts should be insulated.
- Dryers should be butted tightly to each other to minimize space requirements and facilitate facading.

- At least 12 inches behind the exhaust duct should be left for servicing.
- Steam cool down dryers must be properly trapped.
- The dryer duct should be held as close to the dryer as possible.
- install so that bottom of dryer door clears top of carts. This may require mounting on a concrete pad of 4" to 10" high.

C. Dryer Ducting

Many dryer installations suffer from poor exhaust duct installation. There are some rules which must be adhered to if efficient operation is to be achieved. While it is best to have each dryer on a separate short exhaust duct without bends, this is not usually feasible. It is, therefore, essential that the following rules be strictly adhered to.

1. The diameter of the duct for a single dryer must not be smaller than the dryer connection.

2. The area of the duct for multiple dryers must equal the total dryer duct area for the number of dryer connections. The chart below is applicable for U.S. made 100 to 150 lb. dryers.

_ of Dryers	Diameter	Primary Duct Area*	Diameter	Primary Duct Area*
1	12" duct =	113.1 sq. in.	10" =	74 sq. in.
2	17" duct =	227 sq. in.	14" =	154 sq. in.
3	21" duct =	346 sq. in.	18" =	254 sq. in.
4	24" duct =	452 sq. in.	22" =	380 sq. in.
5	27" duct =	572 sq. in.	24" =	452 sq. in.
6	30" duct =	707 sq. in.	26" =	531 sq. in.
7	32" duct =	804 sq. in.	28" =	616 sq. in.
8	34" duct =	910 sq. in.	30" =	707 sq. in.
9	36" duct =	1018 sq. in.	32" =	804 sq. in.
10	38" duct =	1134 sq. in.	34" =	910 sq. in.

* (see items No. 4 & 5 below)

3. INDIVIDUAL DRYER DUCTS should enter the primary duct in the direction of air flow on an angle less than 30^{o}.

4. If the primary exhaust duct is 20 ft. or has more than two bends the next larger primary duct should be used.

5. FOR EACH ADDITIONAL 20 ft., the primary exhaust duct should be increased one size.

6. The radius of all bends must be equal to or greater than the diameter of the primary duct.

7. All ducts must have at least a slight upward gradient, except from the dryer to the first bend, which should have a slight downward gradient.

8. If the primary duct outlet must be protected from the weather, a weather cap can be constructed as follows:

Outlet Cap diameter = 3 times duct's diameter

Distance from outlet = 3/4 of duct diameter

NOTE: No screens or bags should be attached to the outlet!

9. All connections into the primary exhaust duct must be separated by at least the diameter of the FEEDER duct.

D. Facading of Dryers

Dryers should be facaded to prevent heat from radiating over the staff. Other advantages include the use of the radiated heat by the dryers to temper make-up air, reduce noise, and improve visual effect.

When constructing a facade around dryers:

1. Care must be taken to insure that any material that comes into contact with hot areas of the dryers be non-flammable; metal channels, fire rated sheet rock or the equivalent can be used.

2. Adequate make-up air must be provided so that the dryers are not starved for air. Lower screens or openings can be used in either side walls or the back wall. If windows exist in the back wall, they are usually adequate.

3. An access or service door must be provided. The door need only be large enough to remove the motors and/or other replacement parts.

4. The facade should be lightweight and fabricated so that it can be easily removed for dryer replacement. It is essential that the facade extend to the ceiling or that an independent ceiling (roof) be placed on the facade. The sides need not extend to the floor if added make-up air is required.

EQUIPMENT SPECIFICATIONS

I. NUMBER OF DRYERS NEEDED

As a rule of thumb, we require 2/3 of the washing capacity as the drying capacity.

Hotels which have proportionately more suites, several pools as well as a health club need to have closer to 3/4 of the wash capacity as drying capacity.

Suite hotels and other limited service facilities need just about 50% of the wash capacity as drying capacity.

A. **General Specifications** (regardless of fuel) all dryers should:

1. have 28 to 31 rpms -- a faster rotation will press textiles to the side of the cylinder and hinder wrinkle free drying
2. Be reversing
3. Have cooldown
4. Have lint filter
5. Have no more than 6 lb. per cubic foot capacity
6. Have audible end cycle signals
7. Have separate thermostat and thermometer
8. Preferably have insulated front dryer panel to facilitate facading
9. Have automatic timers
10. Install dryer on a slab to insure that door clearance from the floor is 32" minimum
11. Have automated fire life and safety sprinklers.

B. **Gas Dryer Specifications** all gas dryers should:

1. Have 44" X 42" or 50" X 42" cylinders or equivalent
2. Have minimums of:

	BTU	CFM	Vent
50 x 42	370,000	2250 or more	12"
44 X 42	300,000	1900 or more	12"

3. Have a door, 33" diameter or more
4. Must have air (sail) switch to protect against overheating due to interrupted air flow.
5. Be ordered specifying the following information:

   - The altitude of your hotel's locale, so proper burner orifice can be supplied
   - The type of gas
   - Gas pressure
   - Specific gravity

6. Electronic ignition is greatly preferred!

C. **Steam Dryer Specifications** Steam dryers should:

- have automatic time and temperature controls
- have six coils preferred
- have no air filter on coils
- be ordered specifying steam supply pressure (PSI)

II. HEAT RECLAMATION DRYER

There has been a great deal of publicity concerning the re-use of the hot air from dryers to preheat the incoming air into the heating surface of the same dryer.

The principle appears reasonable, but there are a number of problems:

1. The air is moisture-laden
2. The air has lint
3. It is only being used on gas-fired dryers effectively
4. Installation is expensive
5. Some units present a possible fire hazard
6. cool-down time is extended or extra air valves (dampers) are required, and
7. Drying times are extended.

CONCLUSION: The dryer is the key to a good laundry operation. It appears very risky to go into an area where so little bona fide information is available and where such contradictory claims are being made. At the present time there are too many unknown factors in this conversion. Large dryers are built by manufacturers with a partial heat recirculation system. It is an integral part of the dryer and reuses portions of the exhaust air.

RECOMMENDATION:

A. Do not retrofit modular heat recirculating units to any dryer at this time.

B. Do not purchase heat re-use dryers of 150 lbs. or less capacity until more experience is available and viable engineering data is guaranteed.

OPERATING PROCEDURES

While the procedures used in operating dryers are very simple, they are essential to a high quality finished product. If there is a delay in the processing flow of textiles, no-iron bed textiles can be stored loosely in carts for up to one hour before drying. They can never be stored after they have been dried. They must immediately be folded: thus no-iron sheets and pillowcases should never be dried just before the lunch break or the end of the day, as they will wrinkle. The drying schedule is the only concern until an hour and a half before the end of the work day. Scheduling no-irons for the end of the day must begin prior to washing in order to prevent textiles being stored either wet or dry overnight.

I. NORMAL ADJUSTMENTS

Some adjustments will have to be made periodically to the dryers. They include:

A. Lint Filters

Lint filters should be cleaned at least once each day and preferably twice each day. Failure to clean these filters will result in obstruction to the air circulation within the dryer; this will extend drying times and cause false readings by the thermostats. If the hotel's exhaust ducting systems is designed so that a greater percentage of lint removal is required, an additional lint trap can be placed in the exhaust duct leading from each dryer. This filter consists of a sheet metal box with three or more perforated metal sheets varying from coarse to fine. If this system is installed, the metal sheets must be cleaned at least twice a day in order to avoid restricting the air flow.

NOTE: Furnace or air conditioner filtration type media should never be used: they are too fine and will restrict air flow beyond the blowers' capacity.

B. Gas Burners

On gas fire dryers it is essential that the manufacturer be given relevant data concerning the type of burner to be used for your particular fuel and location. BTU's per cubic foot of gas, type of gas, specific gravity, and the altitude of your hotel will all have a bearing upon the efficiency of the flame. Even if the gas jets were properly sized for your particular operation, the flame should be checked and the burner cleaned and adjusted annually by your gas company. Electronic ignition is preferred to a gas pilot.

C. Steam Coil

It is essential that the coils of dryers utilizing steam as an energy source be cleaned every week. Start the empty dryer and blow compressed air though the coils, letting lint accumulate in the lint basket. There should never be a filter in front of the steam coil.

D. Cylinder Adjustment

The cylinders on most dryers should be adjusted annually or more if required. This is a relatively simple adjustment which can be made by your own maintenance staff. To determine whether an adjustment is required, observe that the top space at the top, bottom, and both sides of the cylinder opening where it meets the front panel of the dryer should be of uniform distance. There should not be a wide gap at the top and a very small gap at the bottom. In normal wear, the cylinder starts to tip forward. In addition, the cylinder basket should be parallel to the front panel of the dryer.

If the dryer is allowed to run while out of adjustment, the following could occur:

- The cylinder could ride on the door, wearing it through;
- Textiles could start to tear within the dryers;
- The spider gear which supports the cylinder could require frequent replacement
- The lip (wiper) of the cylinder could wear through; and
- The drive system (chain or belt) could become loose and make noise, possibly damaging other parts of the dryer.

II. DRYER SETTINGS

Standard settings for dryer operations must be formally determined and followed. Minimum drying times for your work must be provided so that operators won't change the settings. The various makes and sizes of dryers available, and variations in the kinds of fuel they use, make it virtually impossible to set one standard group of dryer settings; it is, therefore, essential that the following procedure be used. The settings must be written onto the dryers and strictly adhered to.

A. **Load Size**

No more than 60 to 80% of terry cloth bath mats should be dried in one load. 80 to 95% of other terry cloth toweling can make one load.

B. **Temperature**

Recommended temperature settings are:

Blankets	140^{o} Fahrenheit
Terrycloth Bath Mats	200^{o} Fahrenheit
Other Terrycloth Items	200^{o} Fahrenheit
All No-Iron Items	170^{o} - 180^{o} Fahrenheit
Shower Curtains	140^{o} Fahrenheit

Important Note: Rags must be cooled down in the dryer for at least 8 minutes prior to removal from the dryers. They should then be loosely spread if they are to be stored overnight.

C. **Time Settings**

Once a dryer has been loaded and the thermostat has been set up properly, the time required to dry that particular load should be determined. With a well-installed high energy dryer, terrycloth mats should dry in 32 minutes, other terrycloth toweling in 22 minutes, no-iron napery in 10 minutes, no-iron sheets and pillowcases in 12 minutes. The procedure for determining these times for sheets and pillowcases is as follows: load a dryer with 20 sheets, set the dryer thermostat at 180° Fahrenheit, and set the timer for 12 minutes with 3 minutes cool-down. If at the end of the cycle the load is dry, reduce the time to 10 minutes heat and three minutes cool-down, re-load and repeat until the minimum drying time has been determined. Once the time for sheets and pillowcases in one dryer is set, load each of the dryers in your laundry with sheets and pillowcases and start them at the same time using the same procedure to insure that a poor exhaust system is not interfering with a dryer's efficiency. Then record the settings on the front panel of the dryer by the timer.

Repeat this procedure for each of the items; terry mats, other terry items and shower curtains, blankets, etc.

The chart on the front of the dryer should appear as follows:

DRYER SETTINGS

(Optimum and Test Starting Points)

	Terry Mats	Terry Other	No-Iron Napery	No-Iron Sheets and Pillowcases	Other
Time	32 minutes	22 minutes	10 minutes	15 minutes	
Temperature	200° Fahrenheit	200° Fahrenheit	180° Fahrenheit	180° Fahrenheit	
Cool Down	3 minutes	3 minutes	3 minutes	3 minutes	
Quantity	80 %	80 % +	20 to 30 pieces or 30 to 40 lbs.	20 to 30 ea./ or 30 to 40 lbs.	
Comments:					

If dryer capacity is marginal it is highly advantageous to separate terrycloth bath mats from other terrycloth items. Terrycloth bath mats require 50 - 75% more time to dry than other lighter weight articles. Therefore, since they are a low-volume item, it is to your advantage to dry them separately.

V. DRYER-AREA FUNCTION SEQUENCE

1) Check to see that lint filters are clean;
2) First load all no-iron textiles -- other than terry -- to the proper capacity and start dryers;
3) Check settings on the face of the dryer to make sure that they are appropriate to the load;
4) Fill in time and work sheet category loaded into that dryer onto the production sheet;
5) Repeat steps 1-4 for each dryer;
6) As soon as the dryer stops unload it and make sure that it is taken directly to the folding area;
7) Reload the dryer, repeating steps 1-4;
8) If an oversupply of dried no-iron items are building up in the folding area, load the next dryers with terrycloth or other non-temperature critical items.
9) At the end of the day if any no-irons are left unfolded, they must be washed and dried the next day, if acceptable quality is to be achieved;
10) No textiles (dry or wet) should ever be left in a gas dryer. Dried textiles can, however, be left in steam and electrical dryers;
11) Rags are never to be dried unsupervised. Their drying cycle is to be followed by a minimum of 15 minutes cool down, and rags are **always** to be removed from the dryer as soon as they are properly cooled down.
12) Clean lint filters;
13) Once each week use compressed air to blow through the steam coils while the empty dryer is running; and
14) Turn in production sheet to supervisor.

NOTE: 90% of all laundry fires are attributable to rags not being washed and dried properly.

VI. HANDLING POLYESTER BLEND SHEETS

In some cases sheets may be tumble dried completely or partially dried in a tumbler to reduce the load on ironing. Tumble dryers are usually gas fired or steam heated. Thermal damage to polyester fibers is usually confined to gas fired tumble dryers.

Drying in tumble dryers occurs through exposure of wet fabrics to hot air and gases. If the temperature of that air impinging on the fabric is high enough and the fabric is dry, fusion or melting of polyester can and does occur. Scorching and yellowing may also occur, but these effects are obvious. Contraction of polyester and high shrinkage will occur before fusion, but they may occur virtually simultaneously. Fabric with appreciable amounts of fused fiber may become harsh or even brittle. Similarly, fitted sheet bindings may lose elasticity and with the fabric shrinkage fitted sheets may become unusable and useless.

Heat damage in tumble dryers is mostly caused by excessively high flame heights at the burners. The solution is controlled flame height at the burners. Most gas dryers use an exhaust temperature indicator to signal when a load is dry. It is worth noting that this indicator normally does not regulate burner flame height or modulate burner output. Nor does it measure gas temperature or temperature within the tumbler. Thermal indicator papers and a fabric moisture monitor are also useful in regulating tumble dryers.

Chapter 7
FOLDING AREA

The presentation of the final product is the goal and purpose of the laundry. The folding function is the final processing technique in the production of high quality textiles and napery. Every function in the laundry leads to this: failure to fold immediately and properly will undo all of the prior steps, regardless of the care taken.

NOTE: No-iron flatwork textiles must be folded immediately after drying. If they are allowed to sit in a cart for even a short period of time or have excessive weight or pressure placed on them in the cart, they will wrinkle.

PHYSICAL REQUIREMENTS

The folding area of the laundry is only one of five separate departments (the others are: soil-sort, washroom, dryer room, and the valet area),

In the folding area of a laundry there may be heat-generating equipment; there are sheet folders, towel folders and the insulated front panel of the dryers. There is no reason why this area cannot be separated either by partitions or by direction of air flow to provide a good working environment, and there are several reasons why working conditions here should be pleasant: 75%-90% of all laundry employees work in the folding area. These employees are responsible for maintaining a high quality textile standard for the hotel; they are the final inspectors of all textiles to be sent to the guest floors. Employees cannot maintain high standards if they are required to work in a hot, noisy, humid, dark, dungeon-like atmosphere. These conditions invariably develop poor maintenance habits, poor housekeeping within the laundry, poor sanitation among employees and poor work attitudes.

These conditions are brought about by a lack of planning or by lack of knowledge of the laundry's operation. It is a very expensive to correct these conditions, once they occur, so it is essential that consideration be given to the working environment when planning a new laundry or renovating an existing one. A well-lighted and ventilated, very cleanable environment must be provided.

I. CAPACITY

Laundries that process over 550 pounds per hour should consider using automatic folding equipment. Under normal circumstances any laundry processing over 550 pounds per hour would benefit from using an automatic folder and possibly by using a sheet cross-folder.

A. Guidelines for Folding Towels
The following standards for determining equipment capacity apply:

- In laundries producing 350 pounds per hour or less, the need for towel folders is marginal

- In laundries producing from 350 to 550 pounds per hour, the need is optional

- In laundries producing more than 550 pounds per hour, towel folders would be very beneficial.

B. Workflow Patterns

The folding area should be close to the dryers. This is to insure that no-iron textiles are taken from the dryers as soon as they are processed. The flow within the folding area should be from the dryers toward the textile storage area, whether this is in Housekeeping or in a holding area within the laundry, for accumulation prior to being taken to the floors. Next to the towel folder should be a folding table for bath mats, wash cloths, etc.

C. Flooring

The floor in the folding area must not be bare concrete. Tile or linoleum can be used. Clean items which touch the floor must not be soiled or stained. The floor must be of a medium shade, like terra cotta, to camouflage or disguise any stains which will occur.

D. Lighting

Since the final inspection of all work is done here, lighting in the folding area must be very bright. The speeds of automatic equipment, like folders, make very good visibility essential. A minimum standard for lighting in this area is 100 footcandles. Employees can tolerate a lighting intensity of up to 150 footcandles.

E. Ceiling

Most lint generated in a laundry comes from handling dry textiles. So the ceiling in the folding area should be a flat hard surface which can be easily cleaned. Many operations which have limited ceiling height find that a louvered ceiling with three to four inch vertically hung slats is acceptable if the ceiling above is painted a dark flat color.

F. Wall

Wall surfaces in a folding area should be flat and non-porous. They must be easily cleanable. A glazed or ceramic tile which can be periodically washed with water or vacuumed is best. The color of the ceiling and walls should depend upon the color of the floor covering.

G. Ventilation

Ventilation of the folding area depends upon its relationship to the washroom and drying area. If it is not partitioned, air flow should be from the folding area through the washroom, and the dryers should be facaded with an independent ventilation system of their own. A minimum of 6-10 air changes per hour is required in a non-air conditioned folding room. This is sufficient to allow the operators to feel the air movement and comfortably evaporate employee perspiration, effectively cooling them.

H. Utilities

Folding rooms use almost no utilities. Folding machines require electrical and air connections. Since both of these pieces of equipment are movable (i.e., on casters) the connections should be coded or shielded wiring and hoses which hang from the ceiling directly over the appropriate piece of equipment. For iron-type operations, utilities must be located away from traffic areas. All pipes (steam and return) should be insulated.

EQUIPMENT SPECIFICATIONS

I. TOWEL AND/OR SMALL PIECE FOLDERS

This piece of equipment is primarily for the folding of bath and hand towels. Some models, however, will fold pillowcases, napkins, and bath mats. The primary considerations in making the selection of which folder to purchase should be:

- Flexibility
- Reliability
- Equipment specifications
- Floor space requirements

A. Flexibility

Towel folders are available to fold all types of towels. It is essential that the determination be made as to the type of toweling to be used for an individual hotel (including pool and beach towels). Under no circumstances should a towel folder which will not french fold (with one or two cross-folds) at least a 54 inch bath towel to be purchased. However, if larger towels are used the minimum size accepted by the folders should be increased correspondingly. As the maximum size which can be folded varies by machine, so does the minimum size. It is essential that hand towels be measured after they have been washed several times to determine their length, since some towel folders will not fold anything shorter than 24 inches.

RECOMMENDATION: It is strongly recommended that purchase specifications state the minimum folding length to be down to 18 inches. This will allow for the automatic folding of napkins, most hand towels and other small items.

B. Reliability

Some available towel folders are difficult to service and/or repair. While the operation of a small piece (towel) folder is relatively simple, care must be taken to insure that repair parts and service are readily available.

C. Specifications
Small Piece Folders

- must be capable of french-folding 18 inch minimum size towels used in a specific property. The shortest maximum length in no instance should be less than 54 inches. However, this must be sized to your hotel's towel length.
- must be 3-phase, proper cycle and voltage for user's locale
- must have easy access to the interior for clearing jams.
- must be properly shielded to meet local safety requirements.
- must have floor space requirements stated and evaluated for compliance with available space
- must include a return conveyor
- must be capable of stacking 5, 10, 15, 20 and 25 units in one stack
- must have all connections for utilities (air and electricity) overhead. This will allow easy access to all sides for service and repair.

Larger Hotels should consider purchasing a unit which has an automatic sorting feature.

Small Hotels should ensure the folder has a front return. Thus the operator does not have to walk around to move the folded towels off the belt.

OPERATING PROCEDURES

Terry cloth items should not be shaken out (prepared for) prior to being fed into a towel folder. This machine is designed to serve the dual purpose of convenient sorting and folding of terry cloth items, and shaking out wastes time and labor.

I. BATH MATS

Should be separated during the soil sort operation. Mats should never be dried with bath towels, hand towels, or face towels (washcloths), so they will also be rewashed and folded separately.

II. ALL OTHER TERRY ITEMS

Should be taken directly to the folder. Bath towels should be fed directly into the folder, unless the hotel has a triple sort folder.

III. HAND TOWELS

Should be sorted into another cart as bath towels are fed for later folding through the towel folder.

IV. FACE TOWELS (wash cloths)

Should be placed into another cart or net for manual folding at a table by the same employee(s) folding bath mats.

- ideally the operator folding face towels (wash cloths) and bath mats should also clear the towel folder conveyor so that the operator does not have to stop feeding to empty the machine receiver.

- the operator (towel folder) should have nets or carts available for accumulation of torn or soiled items observed during the feeding process.

It is essential that the towel (small) folder be run continuously as long as there is a supply of material to be fed. The operator should never (except in very small laundries) be required to stop feeding to empty the machine, shake out or go to the dryers for more work to fold.

Chapter 8
VALET

INTRODUCTION

The valet department is considered part of the Laundry Departments responsibility. When the valet services are present in a hotel, they share the laundry's duties, depending on the organization of the department.

IMPORTANT

- REMEMBER - You do not have to dry clean or launder every garment that a guest may send to you. It is better to return a garment unprocessed to the guest, than to ruin it.
- Guest work gets priority - Begin dry cleaning the guest work first so that they can be delivered back to the guest by 4:00 p.m.
- Do not process leathers, furs, or sequined dresses. If you do dry clean these items you must obtain approval from the guest first, in writing!
- Test all colored garments for color fast dyes.
- Keep a count of the "free" staff garments processed, by person.
- Get to know your dry cleaning chemical supplier; he is your best friend!
- Allow only one employee (other than the valet manager) to spot garments. It is essential to have a good spotting book available for reference.
- The valet area must be kept clean and organized all during the work day otherwise losses will be excessive and quality will suffer.
- This department must be kept secure. Do not allow traffic into this department and lock it when the staff leaves.

<u>Morning, First</u>

1. Make sure the steam boiler is started, the vacuum unit is turned on, and supplies are available.
2. Pickup the guest bundles between 7:00 a.m. and 10:00 a.m. - The number of employees will depend upon the size and type of the hotel.

   Some hotels have the bellmen pickup the guest bundles. If this is the case, make sure that the bundles are brought to the valet as quickly as possible so that marking can be started.
3. Pickup the employee uniforms from the Housekeeping department.

4. Mark guest garments and assemble into "Lots" of twenty bundles each. Make as many "Lots" as necessary. It will be necessary to sort guest work into categories such as: colors - fabrics - shirts - etc.

   If the guest list differs from your count, you should, depending upon your hotels policy, either:

   a) Do not process or mark any of the guest items (leaving their items in their original laundry bag) until the guest is contacted

   b) Mark the tag with the actual count, process the items and attempt to contact the guest as soon as possible, BEFORE THEIR WORK IS RETURNED TO THE ROOM.

5. Begin cleaning the guest shirts and other garments.

6. Begin washing and dry cleaning uniforms when guest work is completed.

Mid-Morning

7. Start pressing, and assembling guest garments as soon as they are processed. When the first "Lot" is completed, check for any lost items. Do not wait to check for lost items until the end of the day!

8. Press and hang uniforms in proper place. Make sure that the tunnel finisher is used, if available.

At 3:00 to 4:00 p.m.

9) Deliver guests' cleaning to guests' rooms.

10) Clean the area and verify that all items have been delivered as received.

REMEMBER - You do not have to dry clean or launder every garment that a guest may send to you. It is better to return a garment unprocessed to the guest, than to ruin it.

Chapter 9
Standards and Training

INTRODUCTION

Three complaints we often hear from today's Institutional Laundry Manager are:

1. Experienced laundry workers are hard to find and the people who are hired don't do a good job.

2. Today's employees are not interested in their jobs and they don't want to work.

3. It is impossible for us to produce the amount of work expected with our present equipment.

On the surface all these complaints may appear to be valid, but the fact is that laundry managers must face these facts:

1. Experienced laundry workers who are doing good jobs are not looking for employment. They have been properly trained and are doing good jobs and are interested in their job and not looking to make a change.

2. It is absolutely impossible for laundry workers to take any interest in their jobs if they do not actually know their jobs and how to perform them properly.

3. It may seem impossible to produce all your work with your present equipment only because the production is less than the actual potential of that equipment.

Today’s laundry managers are under constant pressure to increase production and hold down costs. It is also true that many completely overlooking the importance of training their employees.

Many of today's laundry problems are the direct result of employees not knowing their jobs which results in not doing a good job or taking interest in work.

The most common excuse given by laundry managers for not training employees is that they don't have the time. They, in fact, spend far more time than would be required to train the workers in trying to overcome and correct the problems caused by poorly trained employees.

I. KNOW THE SCORE AND PERFORMANCE AVERAGES OF YOUR EMPLOYEES

Laundry processing is definitely a "team effort". Team perform determines the success of the laundry operation. The Laundry Manager must have an accurate means of measuring the job performance of each individual laundry employee.

WHAT IS WORK?

It is some form of activity, physical, mental or emotional, and it can be any one or a combination of these activities. All work involves activity, but all activity can't be classified as work. Activity can also be in the form of play, relaxation or pleasure.

Consider a sports example. Amateurs play a game. Compensation is the pride of winning and the personal feeling of excelling in their particular endeavor. In professional sports, people may play the same game, but it's work. The compensation is money. Both the amateur and the professional play the same game, and play it just as hard. The difference between them is attitude and monetary gain.

Sports may be compared with the laundry operation. The players in any sport activity always know the score, but do your laundry workers know the score? In golf, each hole has a par, but does each of your laundry operations have a par? Every bowler knows their average, but do your laundry employees know their averages?

There is a vast difference between work and play, but it is very interesting to note that in most cases persons playing a game will exert much more effort and strive for a better performance than workers doing their jobs. What causes this difference? Is it because of the fact there are incentives in playing a game - knowing the score - improving their averages - beating par and also receiving recognition for good performance?

It is essential to have some type of work measurement as an incentive for your laundry employees. Production Standards are the logical way of letting each employee know their par and exactly what is expected of them. Production Standards will provide the members of your laundry team an incentive for doing a good job because everyone will know the score.

Production Standards bring the whole job out in the open, and the results can be verified by anyone at any time which is an automatic incentive for doing a good job and then receiving recognition for a good performance.

II. WHAT IS A PRODUCTION STANDARD?

A production standard can be defined as a point at which the manager or supervisor can gauge a worker. It is the rate of production which is expected from a normal worker under normal conditions, hour after hour and day after day. It is what is expected of a worker (par) in return for their basic hourly wage.

Production Standards can't be universally applied. There are too many factors and variables effecting the same operation in different plants. Here are some factors that influence setting up Production Standards:

- types of equipment
- arrangement of equipment
- types of work being processed
- mix of work
- preparation of work

- how work is handled
- interruptions on the job
- method used for charging time to individual units
- time for warming up equipment
- time for starting and stopping
- charging of rest periods
- time for delays
- fatigue allowances
- quality demands on the institution
- Steam and water pressures and sequence of operations.

Measure each Production Standard accurately in units that truly reflect the amount of activity involved. Set up all Production Standards to apply only to a specific job or operation as it is being performed in a specific plant.

In setting up Production Standards for your laundry, make sure that all workers are fully informed as to what you are doing and why it is being done. Assure each employee that you are not trying to make them work harder or faster, but rather trying to make their jobs simpler and easier. The effectiveness of your program depends on receiving the cooperation and support of all employees.

Before attempting to set-up your Production Standards, following these steps:

1. Study methods being used. Try to simplify and improve upon them.
2. Establish a definite sequence in performing the operation.
3. Be sure workers are properly trained and fully understand the job.

In a large laundry operation, it will be necessary to use actual time study techniques for setting up the Production Standards.

In a small operation, the following guidelines can be used to establish some fundamental production standards:

GUIDELINES

1. Put the workers at ease. Explain that they are to perform the operation in a normal manner.
2. Be sure the workers follow the proper sequence of operation each time they go through the elements of the job.
3. Keep the worker's interest. Make sure they are performing each task correctly and at a normal working pace.
4. Establish your production standards based on what a worker can produce, performing the given task correctly, under normal working conditions, with suitable time out for rest, and can be maintained throughout the entire work period.

After establishing your production standards, use them to improve your laundry team. Let the workers know their par and whether they are maintaining their averages, and make certain the laundry team knows the score at all times.

NOTE: Give public recognition to all laundry employees who are performing well.

It is impossible for any worker to have an incentive to improve their performance if there is no way of measuring performance. Point out the fact that the Laundry Manager seldom receives praise for doing a good job, but he/she should not be discouraged. It is the Laundry Manager's responsibility to do a good job.

NOTE: The greatest reward any Laundry Manager can receive is to have those under their direction say they are better people, better workers, or can do a better job because of their direction and leadership. This is the type of management that builds morale, and morale is the backbone of any successful laundry operation.

RECRUITMENT

Human Resources and Laundry management are constantly communicating to:

1. Requisition Team members. An employment requisition is completed by each department head to replace or add positions in the hotel. Human Resources will not advertise, recruit or screen for any position until the Employment Requisition Form has been completed and approved.

2. Recruiting Team members. This is a process by which applicants are sought and screened for suitability for positions in the operation. The process involves announcing job vacancies through proper sources such as newspaper advertising, interviewing and evaluating applicants for open positions.

    A. External Recruiting -- New team members often contribute fresh ideas and new ways of doing things. External recruiting sources include networking as well as temporary and leasing employment agencies and advertising.

    B. Internal Recruiting. Current team members represent a pool of candidates that have acquired some skills, are familiar with the property, and have already proven themselves. Internal recruiting gives team members the opportunity to advance within the ranks of the property, enhancing team member productivity, and morale. Internal recruiting methods include:

        - Cross Training -- Trains team members to perform the duties of more than one position. This may lead to promotions.

- Succession Planning - Identifying key positions and designate team members who, with proper development, can fill them.

- Job Posting - Internal posting can reduce property-wide turnover and provide a known applicant pool. Post each position as soon as it is officially open for people on staff before opening the search to outside applicants. This is done by the Housekeeping Manager or property Recruiter.

C. Call-Back List - Keep a call-back list of all team members and applicants who possess special skills and interests in filling certain positions to be considered when an opening occurs.

3. The Selection Process -- Two important tools are used in the selection process: the Job Description and the Job Specification. A Job Description clearly states the duties involved in a particular job, including all the tasks and related information which make up a work position. A Job Specification lists the personal qualities, skills, and traits needed to successfully perform the tasks outlined by the Job Description.

4. Evaluating. Usually the Laundry Manager evaluates job applicants by reviewing completed job application forms and interviewing selected applicants. Care is taken in structuring questions included on the application forms and during the interviewing and evaluating processes to avoid the possibility of being accused of discriminatory hiring practices.

5. Interviewing. It is important that the interviewer be totally familiar with the job and what is expected of a particular position.

6. After the candidate for employment fills out an Employment Application Form, and is screened by Human Resources he/she will be interviewed by the department head who will select the candidate more suitable for the position and fill out an Interview Summary Form which will be given back to Human Resources with the employment application for reference checks.

After being approved, job offer is made by Human Resources to the applicant and the hiring process starts. A Human Resources Authorization Form is filled out as record of this new hire. The Human Resources Authorization Form is a document used for employment status from the hiring until the termination process. It is used to have records of: Hiring, salary adjustment, change of names and/or addresses, vacation, leave of absence, promotions, change of positions and terminations. Once the team member is hired, he/she will attend Human Resources and/or departmental orientation to get valuable information about benefits, hotel policies and procedures and possibly reviewing team member handbook, HAZCOM (Right to Know), fire and emergencies procedures, tour to the hotel areas and others. New team members are to start an introductory period, which could range from 30 days to 100 days. This introductory period is to give management the opportunity to be sure the team member is well suited for the job, has a good attitude, etc.

It is most important that a Laundry Manager has a LAUNDRY PROCEDURE MANUAL for the laundry. A complete outline follows

PERSONNEL MANAGEMENT TECHIQUES

1. When it is necessary to correct or reprimand an employee, do it in private. This enables the employee to retain a sense of dignity among fellow workers. Always remain calm. Provide a full explanation of what was wrong. Explain what must be done to correct behavior.

2. Attempt to put people at ease when you talk with them. Talk with people, not to them. Communications tend to be one-sided and ineffective when you merely talk to people. You get feedback and response when you talk with them.

3. Seek ways to draw your employees into conversation. Encourage them to discuss their on-the-job problems with you. Ask for suggestions. Be particularly friendly to persons of a shy or aloof nature.

4. Encourage suggestions, both verbal and written. Demonstrate that you are anxious to get new ideas. If you can't use an idea or suggestion, try to discuss it and explain why it can't be used.

5. Occasionally, ask employees for their opinions of procedures. Ask if there are suggestions for improvement. Be ready to try new ideas and experiments. If experiments fail, find out what went wrong. Never overlook or bury any good idea or suggestion for one of these excuses…" It will never work", "We have never done it that way", "We are doing fine without it", "We are not ready for it".

6. Listen to all problems and complaints. Handle them properly and efficiently. Let employees explain their problems. Also, investigate the other side of the story. Never make snap judgments. Attempt to arrive at a fair decision and offer helpful advice.

7. Remember – The manager's attitude will be reflected in each employee. Be enthusiastic about your job or your employees won't be enthusiastic about their jobs. Never gripe or complain in front of your employees. This only encourages them to gripe and complain about theirs.

PROCEDURES FOR SETTING STADARDS

What to do - How to do it - When to do it.
Providing proper supervision.
Encouraging the worker at all times.
Recognizing the worker's ability to perform duties well.
Continuing interest in each workers performance.

The laundry manager must get things done - BY - WITH - and THROUGH PEOPLE, their EMPLOYEES, and must accept the full responsibility for training and proper supervision of these employees.

A good laundry manager knows the job and gets the job done right while the poor laundry manager obtains poor productions and increases the costs of operating the laundry.

Develop those who work for you and devote every effort toward their development.

A successful laundry operation involves a team effort. Each employee has a vital role in making that effort successful. The laundry manager needs to trains employees, assigns their responsibilities, and then lets them out. The laundry manager should never say, "It's easier to do it my self than to explain it."

ASK people to do what needs to be done. People react more favorably to a request than a command. Be fair and friendly, and whenever possible explain the reasons for your request.

Each employee is an individual like you and deserves to be treated fairly and with respect. Of all that has been written or said about dealing with people, there is no better guideline then, "Do unto others as you would have done unto you."

Never hesitate to compliment an employee on doing a good job, be sincere and, if possible, compliment and praise them in front of co-workers. By doing so, you may encourage the others to do a better job.

III. TRAINING AND MOTIVATING LAUNDRY EMPLOYEES

Laundry processing is a continuing and never-ending job, and to achieve a successful laundry operation it requires that training is also a continuing and never-ending job. We constantly hear the excuse that today's workers don't want to work and are not interested in their jobs, but the truth may be that they have not received the proper orientation and training. Employees can't do a good job and be interested in it, unless they know their jobs and how to do them.

A successful laundry operation depends on a good training program, and the success or failure of any training program depends on the laundry manager. The laundry manager must be enthusiastic and interested in the job in order to instill enthusiasm and interest in the employees. The laundry manager must have a complete understanding of WHAT IS TO BE DONE - HOW IT IS TO BE DONE and WHO IS GOING TO DO IT.

The laundry manager must develop a good orientation and training program. The ultimate goal of the program is to develop good employees who will produce quality work at reasonable costs.

The preparation of a laundry procedure manual is a difficult and complex task and this is why we suggested it be done in loose-leaf form. This permits you to make it simple to begin with and to expand it as you go along. As you take steps to improve the laundry operation, you include a full and detailed description of the new method or procedure.

Your laundry procedure manual will be the key to achieving a successful laundry operation, and the job descriptions, work schedules and the policies and procedures for each individual operation are the best guidelines for obtaining and maintaining the most efficient operation of your laundry.

You must constantly strive to improve and expand your procedure manual with the ultimate goal of having it include production standards for each of the operations in the laundry.

Your procedure manual must be kept up-to-date and include any changes made in items covered in the manual. We cannot promise that this manual will guarantee a successful operation, but it is essential. It is part of the hard work and perseverance required to obtain success.

A METHOD FOR TRAINING LAUNDRY WORKERS

Before making any attempt to develop a training program, make certain you fully understand the operation of all the equipment in your laundry and exactly how each job should be performed. If your training program is to be successful, it will require careful and proper planning and preparation; otherwise it will result in poorly trained workers.

Here are four basic steps to follow in preparing your training program.

1. Determine exactly how much skill the worker should have and how much time it should take for the worker to achieve this skill.

   Have a definite plan for training the worker and a positive goal for the time it will take to train the worker.

2. Have a written Job Breakdown or Job Description.

   Before starting to train someone to do a job, make a brief description of the entire main steps and key points pertaining to the job.

   What is a step in making a Job Breakdown? It is the logical group of operations that causes something to happen and thereby advances the doing of the job.

   What is a key point in making a Job Breakdown? It is the detailed piece of information relative to special knacks, feel, timing or precise information which the worker must know if a step is to be done properly.

   Make your Job Breakdown as simple and brief as possible.

NOTE: Don't rely upon your memory in training a worker (you may know the job well, but it is essential that every step and detail is presented to the learner.)

Don't try to teach too much at one time and avoid setting a bad example by jumping from one step to another.

Don't assume that the worker understands, but always make certain that the worker knows and understands what they are doing.

3. Have everything ready.

   Always have the right tools, equipment and materials ready before starting to train the worker.

   Fully explain the possibilities for advancement.

   Point out the importance of the job, and show how it fits into the overall operation of the laundry and meeting the needs of the institution.

   Get the learner in correct position.

   See that the learner is in correct position to perform the job, and be sure they can understand what you are saying and see what you are doing.

   Don't forget that the learner is probably nervous, so try to put him or her "at ease".

NOTE: Don't assume that a learner who has worked in a laundry knows how to perform the job correctly. Always try to "sell" the learner on the importance of performing the job right and the importance of the job they are doing.

4. Present the Job Operation and Job Knowledge.

   - When you feel you have prepared the learner for training, you should proceed to demonstrate how the job should be done.
   - Tell him or her how to do the job.
   - Show him or her how to do the job.
   - Explain and demonstrate step by step and point by point according to your Job Breakdown.
   - Go slowly and be very patient.

   After you have gone through the first demonstration of the job, go through the same procedure a second time. As you go through the second demonstration, ask the learner simple questions about some of the points mentioned in the first demonstration.

   Be patient when asking these questions, and be sure to compliment the learner when correct answers are given.

   Depending on how the learner answers your questions, you must judge whether it is necessary to repeat the demonstration a third or fourth time.

   Be sure to follow the steps and points in the exact order in the Job Breakdown on each demonstration, as skipping or missing a step or point will only confuse the learner.

NOTE: Don't leave the learner at any time until the training job is completed.

DEFINITIONS

I. STAFFING

Staffing involves the selection of the persons who will perform the various jobs in the laundry and should include:

Pick the best person for each specific job. Consider physical and mental capabilities of each individual before selecting them for any job.

Providing proper supervision for your workers at all times.

To provide adequate coverage so that your laundry will meet all the needs of the institution at all times.

The best criteria for measuring the effectiveness of your staffing are low labor turnover, good employee morale and performance, high productivity and low labor costs.

II. DIRECTING

Directing is a most essential step in achieving a successful laundry operation, and it requires proper training and supervision of all your employees.

Training is the direct responsibility of the Laundry Manager and it is a never ending job. Unless each employee is properly trained, you can't expect a good performance or their taking any interest in their job.

Even though your employees have been properly trained, it is very essential for you to constantly check to see if they are doing the job as trained.

III. CONTROLLING

Controlling is the measurement of all activities to determine if you have accomplished your plans. Without proper controls, there is no way to measure the effectiveness of your planning, organizing, staffing or directing. Proper controls should provide the following information on your operation:

IV. PRODUCTION FIGURES

The amount of work processed and employee productivity.

V. COST OF OPERATING THE LAUNDRY

Comparison of actual cost figures with the budgeted figures.

You can be almost certain that some of your employees will cause partial failure of your plans, but only through good controls can you identify those employees whose performance is below standard, and then make sure they improve or you replace them.

ASSISTANT LAUNDRY MANAGER

Reports to: Laundry Manager

POSITION PURPOSE:

To assist Laundry Manager in the daily operation of the laundry/valet department providing clean linen, uniforms, and guest valet service to maintain Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
55%	Oversees daily operation of flat-work department working closely with the production supervisor to ensure production standards are achieved, and sufficient linen is available for hotel needs.
10%	Oversees daily operations of valet department to ensure guest valet services are being provided in accordance with department standards.
10%	Oversees daily operations of Uniforms room including ordering of new uniforms, inventories, and uniform repair where applicable.
20%	Supervises daily linen pick-up and delivery to provide rooms linen to housekeeping.

Other:

Regular attendance in conformance with the standards, which may be established by us from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, and up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS:

In addition for performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Assist Manager in conducting circulating inventories.
- Assist in payroll forecasting and weekly scheduling.
- Establish and maintain linen room pars.
- Will be fully responsible for laundry department in the Manager's absence.
- Other duties as assigned by the Laundry Manager to ensure efficient operations of laundry/valet department.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodating, using some other combination of skills and abilities.

- Ability to speak, read and write English in order to communicate effectively with other hotel departments and guests.
- Ability to supervise large numbers of employees, up to 40-50 at a time.
- Good communication and problem solving skills.
- Knowledge of Labor Union contracts and inventory controls.

QUALIFICATION STANDARDS

Education:

Experience:

Previous supervisory experience, working knowledge of hotel/commercial laundry operations. College degree or equivalent experience that provides the required knowledge, skills and abilities.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

ADMINISTRATIVE ASSISTANT

Reports to: Laundry Manager

POSITION PURPOSE:

Assist the Laundry Manager in various administrative tasks. Processes leave requests, payroll, PA forms, etc. Act as Foreign Language/English interpreter as needed.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
20%	Types or writes PA forms for holidays, sick leave, vacation and new hire/terminations. Examines written documents for filing in file drawer or binder. Opens and distributes mail to appropriate department personnel. Prepares and updates vacation schedules.
20%	Acts as receptionist for department, answering incoming calls and directing to proper parties. Answer inquiries from employees regarding payroll, vacation, sick time, etc.
20%	Reviews weekly payroll and makes necessary corrections to ensure hours worked by each employee are correctly reported, keeps daily record of employee's work attendance and maintains files for personnel related correspondence.
20%	Acts as interpreter for Laundry Management for purposes of employee training, discipline and other personnel matters.
15%	Complete weekly schedules. Uses computer word processing software programs to input correspondence, and other documents which need to be retained for future reference.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition for performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Input productivity figures from various documents in computer to produce monthly production reports.
- Sort payroll check alphabetically and distribute to employees, and obtain employee's signature as a receipt.
- Perform other duties and special projects as assigned, i.e., Research files to obtain information, assist in valet shop behind the counter when needed.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to speak, read and write English in order to communicate effectively with other hotel departments and guests.
- Ability to speak and read other language which may be spoken by majority of the department employees to effectively communicate with them.
- Organizational and problem solving skills needed to create an efficient work area, and handle routine employee problems.
- Basic computer knowledge of WordPerfect and Lotus 1,2,3.

QUALIFICATION STANDARDS

Education:

High school diploma, Business classes of the experience that provides the required knowledge, skills, and abilities.

Experience:

Previous administrative experience.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

PRODUCTION SUPERVISOR

Reports to: Laundry Manager

POSITION PURPOSE:

To oversee the production in the flat-work department by using working knowledge of all areas in the department ensuring that Hilton's high standards of quality are maintained.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
60%	Supervises feeder/folders and processing of all rooms, and Food and Beverage linen to insure standards of production are met.
20%	Supervises wash house and sorting functions.
10%	Assists Manager in conducting circulating inventory of rooms and Food and Beverage linen.
05%	Ensures all equipment is in safe operating condition by visual and physical inspection and operation.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Assist with department scheduling.
- Assist in conducting monthly departmental meeting.
- Coordinate system of linen usage/selection with Banquet department.
- Will be solely responsible for department when Management is not present.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to speak, read and write English in order to communicate effectively with other hotel departments and guests.
- Ability to supervise large numbers of employees up to 20-30 at a time.
- Knowledge of Union labor contracts, inventory controls and laundry operation.
- Good Communication and problem solving skills.

QUALIFICATION STANDARDS

Education:

High school diploma, Business classes of the experience that provides the required knowledge, skills, and abilities.

Experience:

Previous supervisory experience and working knowledge of hotel/communication laundry operations.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

SORTER

Reports to: Production Supervisor

POSITION PURPOSE:

To ensure the proper sorting and distribution of laundry to meet Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
60%	Pre-sort and separate linen by classification and transfer by lifting, carrying or transporting to work carts.
20%	Empty the laundry chute/conveyor and load prepared linen from carts to washer chutes.
05%	Run folding equipment to fold mats, blankets, towels, bedspreads, etc.
05%	Separate out laundry requiring mending or special stain removal.
05%	Clean empty carts.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Sew on buttons and make minor repairs to uniforms.

- Make repairs to linens as requested.
- Other duties as assigned, such as assisting Seamstresses.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to read and write English in order to complete laundry/dry cleaning tags and lists.
- Ability to stand for long period of time.
- Ability to communicate pleasantly and effectively in English with co-workers.
- Ability to push and/or pull racks or carts weighing up to 200 lbs. Requires extending arms overhead.
- Basic ability to comprehend English language sufficient to understand information such as safety labels and instructions.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skills, and abilities. 8th grade education preferred.

Experience:

Prefer previous laundry or uniform room experience.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Knowledge of other language desirable.

WASHER/DRYER

Reports to: Production Supervisor FLSA

POSITION PURPOSE:

To assure the proper washing and drying of linen to maintain Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
80%	Operate washing and drying equipment, load and unload textiles from machines. Measure and administer cleaning agents to laundry according to formulae provided.
05%	Monitor feeder information on washers, make sure all drums are full, and report any irregularities to immediate supervisor.
05%	Set the proper drying and cooling times for different types of linen.
05%	Clean up machines and surrounding areas.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Assist other positions in department as needed or as directed by immediate supervisor.

- Other duties as assigned, such as assisting Sorter.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Working knowledge of the use of laundry chemicals and different formulae, as well as effect on various types of linen.
- Ability or prioritize and organize work.
- Ability to lift, bend, stoop, push heavy loads, and stand for long periods of time. Required lifting bundles of linen weighing up to 50 lbs.
- Ability to push and/or pull wheeled carts weighing up to 350 lbs.
- Basic ability to comprehend English language sufficient to understand information such as safety labels and instructions.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skills, and abilities. 8th grade education preferred.

Experience:

Some laundry experience required.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Prefer understanding of English language.

FOLDER/FEEDER

Reports to: Production Supervisor

POSITION PURPOSE:

To process Rooms and Food & Beverage linen by ironing, folding and counting items to maintain Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average
Percent
of Time

50% Processing of non-terry items by feeding sheeting and napkins in to the iron at established production rates.

20% Processing of terry items by feeding them into folding machines or hand folding them at established production rates.

20% Processing Food & Beverage items by feeding them into the iron at established production rates.

05% Clean up and maintenance of flat work area.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Hand folding of various bulky items such as blankets, bed pads, meeting room set up, covers, etc.

- Assist in conducting circulating inventory by counting and recording various items.
- Other duties as assigned, such as assisting sorters.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to lift, bend, stoop, twist, push or pull heavy loads and stand for long periods of time. Required lifting bundles of linens weighing up to 30 pounds.

- Basic ability to comprehend English language sufficient to understand information such as safety labels and instructions.

- Ability to push and/or pull wheeled racks and carts weighing up to 200 lbs.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skill and ability.

Experience:

Some laundry experience preferred.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Prefer understanding of English language.

LINEN DELIVERY PERSON

Reports to: Assistant Laundry Manager

POSITION PURPOSE:

Assure appropriate pick-up/distribution of soiled/clean linens for guests rooms to maintain Hilton's standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
50% or 0%	Pick-up soiled linen from room attendants and deliver to sorting room via linen chutes and/or laundry carts. Requires pushing/pulling linen carts up to 250 pounds.
35% or 90%	Deliver clean linen from laundry department to linen lockers throughout the hotel. Requires pushing/pulling linen carts up to 500 pounds. Requires extending arms overhead, bending, grasping and lifting bulky linens weighing up to 50 pounds from shelves and carts.
05%	Maintain appropriate inventory levels to ensure continuous supply. Control room and table linens and organize by size, color and department.
05%	Complete inventory sheets in English with current count of linens and the amount required for resupply to maintain predetermined par/standards.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Assist in laundry inventories by rearranging linen in laundry department and store rooms.
- Other duties as assigned such as assisting in clearing laundry chutes.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to read basic English orders and communicate effectively with guests who request additional linens.
- Ability to continually stand and move around the hotel for long periods of time.
- Ability to lift items (linen) weighing up to 50 pounds.
- Ability to push and/or pull wheeled carts weighing up to 500 pounds.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skill and ability.

Experience:

None required.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:
Prefer understanding of English language.

JANITOR

Reports to: Laundry Manager

POSITION PURPOSE:

To clean and maintain the laundry/valet and uniform room according to Hilton's high standards of cleanliness and quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
40%	Cleans laundry area according to schedule by sweeping and mopping floor, cleaning employee bathrooms, blowing down laundry machines with compressed air, empty trash receptacles and vacuuming office areas.
20%	Cleans Valet area according to schedule by sweeping and moping floors and emptying trash.
20%	Cleans uniform are according to schedule by sweeping and mopping floors and emptying trash.
15%	Receives all deliveries for laundry department at loading dock or store room, fills out receiving records and physically moves items using carts, dollies and cart carriers to designated areas.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Does deep cleaning when required, such as vacuuming ceiling in laundry and cleaning store rooms etc.
- Assist other positions in department as needed or as directed by immediate supervisor.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to lift, bend, stoop, push or pull heavy loads, and stand for long period of time. Requires lifting items up to 50 lbs.
- Ability to push and or pull wheeled carts weighing up to 200 lbs.
- Basic ability to comprehend English language sufficient to understand information such as safety labels and instructions.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skills, and abilities.

Experience:

Some Janitorial experience preferred.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Prefer understanding of English language.

UNIFORM ROOM ATTENDANT

Reports to: Laundry Manager

POSITION PURPOSE:

To ensure proper receipt and distribution of clean, pressed uniforms for employees to maintain a well groomed appearance in accordance with Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
55%	Received and issue all uniforms. Issue uniforms on an exchange basis only, in order to maintain uniform control. Store old uniforms until otherwise directed by supervisor.
20%	Sort uniforms by color and type for dry cleaning and laundry. Send and receive dry cleaning and laundry for processing.
15%	Maintain inventory and control of all uniforms and/or accessories by size and department.
05%	Advise supervisor of low inventory and prepare P/R for re-ordering.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Sew on buttons and make minor repairs to uniforms.
- Make repairs to linens as requested.
- Other duties as assigned, such as assisting Seamstress.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to read and write English in order to complete laundry/dry cleaning tags and lists.
- Ability to stand for long periods of time.
- Ability to communicate pleasantly in English with co-workers.
- Ability to push and/or pull racks or carts weighing up to 200 pounds. Requires extending of arms over head.
- Basic ability to comprehend English language sufficient to understand information such as safety labels and instructions.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skill and ability. 8th grade education preferred.

Experience:

Prefer previous uniform room experience.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Knowledge of other languages desirable.

SEAMSTRESS/SEWER

Reports to: Assistant Laundry Manager

POSITION PURPOSE:

To repair uniforms, linen, blankets, spreads, sheets and table cloths to assure proper fit and maintain good condition consistent with Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average
Percent
of Time

50% Visually assess repair needed, accurately measure and alter employee uniforms prior to issuing, using sewing machine. Some manual repair necessary.

30% Repair and visually inspect various linens (including bulky/heavy items) using industrial sewing machine. With assistance, required the pushing, pulling, and lifting of items weighing up to 50 pounds.

05% Fit and alter guest clothing when requested. Manually sew buttons and occasionally do detailed repair.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

❍Assure proper issuance and distribution of employee uniform in the absences of Uniform Room Attendant or during heavy traffic periods.

❍Other duties as assigned such as assisting Uniform Room Attendant when requested.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

❍Ability to perform basic functions on sewing machine.

❍Visual ability and manual dexterity to perform detailed repair work.

❍Ability to manually push, pull, or lift items weighing up to 50 pounds.

❍Ability to communicate pleasantly and effectively in English with co-workers. Also to read and write English in order to complete daily seamstress log.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skill and ability. 8th grade education preferred.

Experience:

Previous experience using sewing machine proficiently.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Knowledge of other languages desirable.

DRY CLEANER

Reports to: Laundry Manager

POSITION PURPOSE:

To dry clean and press guest garments and employee uniforms in timely manner, maintaining Hilton's high standards of quality.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
30%	Dry cleaning and spotting of guest garments and employee uniforms by proper application of cleaning chemicals and use of dry cleaning machine.
30%	Pressing of guest garments and employee uniforms utilizing presses, puff irons, and steam iron.
30%	Washes/dry cleans shirts, blankets, bedspreads and table skirts for various departments.
05%	Operator maintenance on dry cleaning machine, i.e., changing filters and cooking filters, filling of fluid.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Answers valet phone and takes guest orders, logging in all laundry/dry cleaning orders.
- Report all suspicious persons or activities, hazardous conditions, etc. to Security/Safety department.
- Other duties as assigned, such as assisting valet operators in pick-up and delivery.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to speak, read and write English in order to communicate effectively with the guests and fill out laundry and dry cleaning tickets.
- Must have working knowledge of dry cleaning operations and spotting procedures.
- Must have working knowledge of pressing operations in a dry cleaning setting.

QUALIFICATION STANDARDS

Education:

High school diploma or the experience that provides the required knowledge, skills and abilities.

Experience:

At least 2 years of dry cleaning/spotting experience required.

Licenses or Certificates:

Dry cleaning and spotting certificates preferred.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other: None.

VALET OPERATOR

Reports to: Laundry Manager

POSITION PURPOSE:

Assure efficient retrieval, processing, and distribution of laundry/dry cleaning in order to provide laundry/valet services to our guests.

EXAMPLES OF DUTIES:

ESSENTIAL FUNCTIONS:

Average Percent of Time	
25%	Presses clothes of hotel guests and employee uniforms.
30%	Retrieve, record, distribute for cleaning and deliver guest laundry. Retrieval of laundry requires bending, stooping, and lifting bags of up to 30 pounds from guest rooms on a continual basis.
15%	Sort employee uniforms by department, hang on racks, and maintain production log. Answer telephone calls and inquiries from guests regarding laundry/valet service. Logs of all requests for service, and starts audit trail for all laundry/dry cleaning items.

Other:

Regular attendance in conformance with the standards, which may be established by our hotel from time to time, is essential to the successful performance of this position. Employees with irregular attendance will be subject to disciplinary action, up to and including termination of employment.

Due to the cyclical nature of the hospitality industry, employees may be required to work varying schedules to reflect the business needs of the hotel.

Upon employment, all employees are required to fully comply with our hotel rules and regulations for the safe and efficient operation of hotel facilities. Employees who violate Hotel rules and regulations will be subject to disciplinary action, up to and including termination of employment.

SUPPORTIVE FUNCTIONS

In addition to performance of the essential functions, this position may be required to perform a combination of the following supportive functions, with the percentage of time performing each function to be solely determined by the supervisor based upon the particular requirements of the hotel.

- Deliver clean employee uniforms to Uniform Room.
- Respond to all guest requests for assistance, direction and other information.
- Report all suspicious persons or activities, hazardous conditions, etc. to Security/Safety department.
- Other duties as assigned, such as assisting Laundry Manager when requested.

SPECIFIC JOB KNOWLEDGE, SKILL AND ABILITY

The individual must possess the following knowledge, skills and abilities and be able to explain and demonstrate that he or she can perform the essential functions of the job, with or without reasonable accommodation, using some other combination of skills and abilities.

- Ability to read and write basic English in order to complete laundry/valet tickets and understand information such as safety labels and instructions.
- Ability to communicate effectively and pleasantly in English with guests as to the status of laundry orders.
- Ability to push, pull or lift heavy loads weighing up to 30 lbs. as the position requires continuous transportation of laundry to and from guest rooms.
- Ability to push and/or pull wheeled racks and carts weighing up to 200 lbs.

QUALIFICATION STANDARDS

Education:

Any combination of education and experience that provides the required knowledge, skill and ability. 8th grade education preferred.

Experience:

No previous experience required. Prefer previous experience in laundry/valet operation.

Licenses or Certificates:

None.

Grooming:

All employees must maintain a neat, clean and well groomed appearance (specific standards available.)

Other:

Prefer knowledge of other languages.

LAUNDRY PROCEDURE MANUAL

A Laundry Procedure Manual should be developed for each property. Following information is required to be included.

I. Purpose of the Laundry
To provide all the clean and sanitary linens required to operate the institution.

II. Laundry Department Hours
Explain the days and hours the laundry operates.

III. Staffing
(A) List all job titles in the laundry
(B) Give job descriptions for each of the job titles
(C) Identify how many employees under each job title
(D) Explain policy on employee uniforms or dress

IV. Supervision
Identify by title the person responsible for:
(A) Organizing and directing the department's operation
(B) Orientation, instruction and supervision of personnel
(C) Scheduling time and assigning duties
(D) Ordering supplies and maintaining equipment
(E) Keeping department records

V. Daily Routine
(A) List all primary routine functions in proper order
(B) List all secondary duties

(C)Outline a complete work schedule covering all functions performed in the laundry.

VI.Pick-up of Soiled Linens
Fully explain the policy and procedures for picking up soiled linens.
(A)Explain the location of laundry chutes and pick-up areas.
(B)Explain how linens are transported to laundry.
(C)Describe the types of containers used soiled linens.
(D)Give times and frequency of soiled linen pick-ups.

VII.Soiled Linen Handling and Weighing
Fully explain the policy and procedure for the handling of soiled work.
(A)How it is prepared for washing. Explain the classification for soiled linen sorting.
(B)Explain the policy and procedure for handling special work.
1.Isolation linens.
2.Linens from special areas
(C)Explain the method of weighing soiled linens and recording weights
(D)Give name and title of person responsible for soiled linen handling.

9.4.1
VIII. Washing and Drying
Fully explain the policy and procedure for washing and drying of linens.
(A)Copies of wash formulas for various classifications of work.
(B)List of all supplies used in the washroom.
(C)Explain method used in scheduling and recording types of loads.
(D)Fully explain the policy and procedure for handling of stained linens.
(1)Special formulas for stained work.
(2)Special stain removal procedures.
(3)List of various types of stain removal agents used in the laundry.
(E)Give title of person responsible for washing and drying of linens.

IX.Finishing of Linens
(A)Fully explain the policy and procedure for flatwork department.
(1)Preparation of items to be irons
(2)Feeding the ironer
(3)Folding, stacking and counting of items that are ironed
(4)Give title of person responsible to flatwork department
(B)Fully explain the policy and procedure for folding of tumble-dried work.
(1)Explain how various items are to be folded
(2)Give title of person responsible for dry folding.

(C) Fully explain the policy and procedure for finishing
(1)List of all items that require special finishing
(2)Explain how they are to be finished.
(3)Give title of person responsible for special finishing

X. Repair - Discarding - Replacement of Linens
(A) Fully explain the policy and procedures for the inspection of linens.
(1)Explain how linens are repaired
(2)Explain the method for discarding of linens.
(3)Explain the system used for replacing linens
(4)Describe the procedure for requisitioning or ordering new linens.
(B) Give name and title of person responsible for these functions

XI. Clean Linen Handling and Storage
(A) Fully explain the policy and procedure for handling and storage of clean linens.
(1)Explain the clean linen storage method.
(2)Describe the linen inventory system.
(B) Give title of person responsible for clean linen handling and storage.

9.4.2
XII.Linen Distribution
(A)Fully explain the policy and procedure for linen distribution.
(1)Describe the type of carts used for linen distribution.
(2)Explain the system used in determining the amounts of linen to be put on carts.

(3)Describe how clean textile inventory is to be rotated.
(4)Explain how linen count for using areas is recorded.
(5)Give time that clean linens are delivered to each area.
(B)Fully explain the policy and procedure for obtaining emergency supplies of linen.
(1)During regular laundry hours.
(2)After the laundry is closed.
(C)Give title of person responsible for linen distribution.

XIII. Supplies and Equipment
(A)Fully explain the policy and procedure for requisition and ordering all supplies used by the laundry.
(B)Fully explain the policy and procedure for the maintenance and repair of laundry equipment.
(1)Identify the department responsible for the preventative maintenance program.
(2)Describer the method for repairing equipment and obtaining outside help when necessary.
(C)Give title of person responsible for supplies and equipment.

XIV. Cleaning and Safety
(A) Fully explain the policy and procedure for cleaning the laundry.
(1)Describe functions to be performed by laundry employees and other personnel.
(2)Explain each task to be performed and when it is to be done.
(3)List all requirements for the laundry under OSHA.
(C) Give title of person responsible for cleaning and safety in the laundry. Also, the name of person or persons who represent the laundry on the institution's safety committee.

XV. Records
(A) Fully explain the policy and procedure for keeping laundry records.
(1)Describe the various types of records kept by the laundry.
(2)Explain exactly what is included in each type of record.
(3)Describe the types of reports prepared by the laundry, and how often they are made.
(4)Complete list of all reference materials that are kept in the laundry, such as journals educat-ional materials fire and

9.4.3
disaster plans, personnel policies, equipment operations and parts manuals.
(B)Give title of person responsible for keeping of laundry records and preparing laundry reports.

XVI.Special Information
(A)The laundry procedure manual should also include:
(B)A floor plan of the laundry showing the complete layout of equipment and work flow through the plant.
(C)A detailed report on the condition of each piece of equipment in the laundry with recommendations on priority for replacing individual pieces of equipment. Your recommendations for any new piece of equipment should include justification for the expenditure through savings in maintenance and labor.
(D)Complete policies and procedures covering relationships with other departments. These policies and procedures are prepared with the help and cooperation of the department involved and the approval of management of the institution.

Chapter 10
TEXTILE CONTROL

DEFINITION: 1 Par equals the amount of textiles required to service the specific area for a 24 hour period at 100% occupancy.

I. PARS - HOUSE SET-UP

The par set-up is the maximum stock level of each type of textile needed to accommodate a 24-hour period. When computing par levels, consider the additional requirements such as laundry cycle, necessary replacement textiles, and possible emergency situations.

Use the following model as a basis for house set-up:

1st Par = TEXTILES laundered, stored, ready for use today.

2nd Par = Yesterday's textiles which are laundered today.

3rd Par = TEXTILES in guest room to be stripped and laundered tomorrow.

Safety Factor + 3 par

Add cribs, rollaways, sofa beds, guest requests, airline rooms and turndown rooms.

Note: The number of pars required is dependent on days of operation of Laundry: 5, 6 or 7 days. But the minimum par level is 3, plus 30% safety factor.

II. QUALITY

The quality of textiles selected for use is of paramount importance in achieving both satisfactory use life and acceptable comfort for the guests. Serviceable quality is not synonymous with higher prices. In many instances the highest priced textiles are not designed for use in hotels. Minimum performance standards have been established. Subsequently all textiles are to be purchased through HSM and any problems should be directed to their attention. Please consult your Purchasing Guide for quality standards established for our hotel Hotels.

III. REPLACEMENT TEXTILES

Replacements are needed when textiles are worn, damaged, lost or stolen. The rule of thumb is to store one full par of new textiles on an annual basis as replacement stock. If past history is available, it is used as a guide to replenish par level.

IV. PURCHASE ORDERS

Purchase orders should contain the following information:

* Quality
* Item
* Size
* Color (usually white)
* Expected delivery date

V. INTERNATIONAL FABRICARE INSTITUTE

Our organisation is a member of the International Fabricare Institute, I.F.I., in the U.S. The I.F.I. is a textile research and analysis laboratory as well as a training facility.

It will, for a minimum fee, analyze textiles with which you have experienced problems and diagnose the cause of a problem. In the past they have diagnosed problems of excessive shrinking in poly-cotton bed textiles, excessive snagging in terry items, excessive fading in tablecloths, excessive wrinkling in poly-cotton bed textiles, etc. A report from the I.F.I. may be sufficient evidence on which to base a rebate claim from the supplier or correct the washing process.

All requests for analysis or problem solving should be coordinated through the Corporate Director of Housekeeping in Beverly Hills.

VI. TEXTILE STORAGE

It is important to allow laundered textiles to rest ("breathe") for at least 24 hours before being used. This helps increase the useful life of textiles and provides an opportunity to regain its natural moisture, thus making it stronger.

Store in relatively humidity-controlled areas with proper ventilation. Proper security precautions should and need to be maintained in all storage areas with textiles. One par of textiles should be designed to fit on the shelving of each floor closet. These par levels for each item and for each floor should be posted for the Linen Runner's deliveries.

Next to salaries, textile replacement is the highest expense item in the Housekeeping budget. Fabric type, size and color influence not only the initial purchase cost but also replacement costs. Colored items are usually more expensive and have a shorter lifespan because colors fade through repeated washings.

It is usually preferable to purchase textiles annually and receive them in monthly/quarterly drop shipments. This practice yields a reduced bulk price, and saves valuable storage space.

VII. MARKING

Textiles with names woven into the fabric are nearly obsolete because of additional expense, delays in deliveries, minimum order sizes, their attractiveness as souvenirs, and the hotel's difficulty in properly utilizing embroidered or inter-woven logos in the guest rooms. Marking by an ink stamp or heat pressure stamp has not gained acceptance on room textiles since in most cases such marks are very unattractive. Therefore an increasing percentage of the textiles being purchased by hotels today do not have an embroidered, inter-woven or stamped property mark. However, all tags indicate the year the product was produced.

VIII. COLORS

The use of colored textiles has been limited for guest rooms. All items are now white. Colors in table linens do create processing problems since bleach cannot be used for stain removal. Colored napery requires extreme care in both use and laundering.

BED TEXTILES

(Currently used in our hotels)

60/40 Executive Strip Linen #250

Double	92" x 128"
Queen	102' x 128"
King	116" x 128"
Pillow Case	42"x 36"
Jumbo Case	42" x 38"
King Case	42" x 46"

IX. STORAGE OF NEW TEXTILES

The quantity of new textiles kept in reserve will constantly fluctuate since it will be used to replenish the amount of textiles in circulation. The quantity of textiles required in reserve is determined by the purchase cycle: the longer the cycle, the more textiles will have to be kept in reserve. Ideally the reserve would be built up to a level which will be completely depleted by the time the next textile order is received and still be sufficient to maintain adequate "textiles in circulation" levels. As a practical matter, however, some textiles will be over-ordered since the discard or loss rates vary. The textiles in the reserve and especially that remaining over two purchase periods are subject to damage from several causes. In light of the price of textiles today, it is essential that preventative steps be taken to eliminate this loss before it can occur.

Careless textile storage and/or handling practices are extremely expensive. There are five main sources of damage to stored textiles:

1. Atmospheric
2. Insects - Pests
3. Microbiological
4. Security
5. Contact

The danger of textile damage from these sources is magnified if the linen storeroom is not operated on a first-in, first-out basis. Failure to rotate textiles and assure the use of the oldest textiles first can result in age deterioration such as discoloration, deterioration or dye transfers.

1. **Atmospheric Damage**
   Atmospheric damage refers to humidity, temperature and air circulation. The criterion used in the past was simply that textiles should be stored in a well-ventilated, dry cool area. Because of longer storage times which result from larger inventories, a more scientific approach has been adopted. The ideal conditions are a relative humidity of 40 to 50 percent and a temperature less than 77 degrees Fahrenheit.

   If existing temperature and humidity conditions in the linen storeroom vary significantly from the standards, air conditioning and/or de-humidification is necessary.

2. **Insects/Pests**
   If a storage area is not properly located and secured, infestations of both insects and often mice enjoy eating and building nests in the textiles. Cardboard boxes offer no protection. If shelving is not provided in the textile storage area the boxes are to be kept on pallets. The room overall must be kept clean and ventilated and is to be included in the regular pest control program.

3. **Microbiological Damage**
   Microbiological damage is not as simple to avoid as the other types of damage. Different precautions are taken for cotton, linen and wool items.

a) General
Microbiological tendering, such as is caused by mildew, can be minimized by strictly adhering to the first in, first out issuing procedure and the use of atmospheric controls.

b) Cotton
If cotton items are to be stored for a long period, launder them to remove starch and finishing chemicals which may serve as a nutritive for growth. Unpackaged items should be covered to prevent contamination by dust.

c) Linen
New linen fabric (woven from flax thread) may be stored safely for years without laundering. Wrap stored linen in a dark, opaque paper to prevent discoloration.

d) Wool
Launder wool prior to storage and treat it with an appropriate basic solution, such as Sodium Silico Fluoride. In a final rinse add a solution with a pH of 4, and then lightly extract and air dry the wool material.

e) Synthetics
Synthetics require no special handling since by definition they are only partially natural fibers and are not as subject to this type of damage. They can be stored as cotton fabrics.

4. **Security Damage**
This type of damage is symptomatic of a poorly-controlled textile storage system and inadequate storage facilities. For example:

If employees have access to the storeroom, they may eat their lunches on the packages of new sheets or put cigarettes out on cartons of bath towels.

Some new textiles are stored on unlocked back landings.

New textiles in inventory are an asset and must be treated the same as any other asset, be it cash, food or liquor. They are controlled and issued against requisition by a person who is directly responsible to the hotel Comptroller, according to company policy.

5. **Contact Damage**

Contact damage occurs from direct contact with a surface or substance which stains the stored fabric. Metal shelves which rust, wood shelves which support biological growth or shelf placement close to walls or floors are all sources of this type of damage.

The best type of storage shelving is a non-corrosive (rust proof) metal shelf with sufficient perforations to allow good air circulation. Stainless steel or chrome plated wire shelving is ideal. The shelving should be kept at least 12" from outside walls and 6" above the floor. It is preferred that walls be painted and floors tiled. Plastic laminate covered wood shelves are an acceptable alternative.

X. SHEET SHRINKAGE

A. Flat Sheet Length

HSM specifications are such that sheets are to be **120" or 128"** long **before** hemming. The hem is to be 3" on top side and 1" at bottom end. A 120" long sheet would only be 116" actual usable length, a 128" sheet would be 124" long.

B. Feeding the Sheet into the Ironer

Several hotels show a gain in the width of the sheet and shrinkage in the length. This only occurs if the sheet is fed into the ironer width side first. Sheets that exceed the ironers working width of 120' or more must be fed **hem first**. Sheets are constructed so that they may take the tension of the length without affecting the width. Since the introduction of the expanded length for the Suite Dreams Mattress new ironer equipment that is to be purchased with extra working width of at 130"

C. Temperature of Thermal Oil Ironers

Thermal oil ironers use energy much more efficiently than regular ironers. It is true that they can be made to attain temperatures other ironers cannot, but that is not the purpose for specifying this equipment.

D. Test Results

Tests have shown that excessive shrinkage occurs consistently in laundries where the ironer temperature exceeds the prescribed temperature of 340 degrees Fahrenheit on the report. Check the temperature gauge on the ironer in order to verify the machine's actual temperature output. There is a good chance that the temperature gauge is defective.

We consider shrinkage of 5% to 6% warp and 2% to 3% fill acceptable.

The hotels which feel that they do require more than 340 degrees Fahrenheit to process their textiles need to verify the spin cycle on the washing machines to ensure that proper extraction is achieved. It might be necessary to call the manufacturer's representative in order to get the proper readings. Each machine has a guaranteed extraction ratio, which is sometimes lost due to the type of formulas which were cut in order to accommodate the chemical supplier.

INVENTORIES

I. POLICY

To provide a basis for controlling and ordering an adequate supply of product needed to operate the department efficiently.

A. Procedure

1. Types of Inventories
   a) Rooms Textiles
   b) Food & Beverage Linen
   c) Glassware
   d) Supplies -- Guest
   e) Supplies -- Cleaning

2. Frequency of Inventories
   a) Bi-Weekly
   b) Weekly
   c) Bi-Monthly
   d) Monthly
   e) Quarterly
   f) Annually

3. Establishing Par Levels
   A par is defined as the amount needed to supply the entire hotel with a specific product, for a 1 day period.

4. Build-Up of Departmental Par
   Par levels are dependent upon:
   a) Storage Space
   b) General Storeroom Accessibility
   c) Occupancy Levels in Hotel
   d) Occupancy Levels in Guest Rooms
   e) Regional Variances in Clientele (usage level)
   f) Variety of Supplies Needed
   g) Budgetary Constraints

5. Taking an Inventory
   When completing an inventory, it is important to inventory the space, not the item. Begin in one area and move around the space, counting each item. Do not walk through the space counting individual items.

6. Textile Inventory
   a) It is necessary to count all textiles in circulation a minimum of once each quarter.

i) Notify the Laundry of the date and time of inventory. Insure no textiles move after the specified time until inventory is complete.

ii) Utilize tally sheets to count all textiles on carts and in closets. Insure any textiles utilized by the PM shift are counted also.

iii) Total all individual floors onto a master sheet. Insure discarded textiles are separated and not included in the total.

iv) After completion of inventory, do not move textiles until the Laundry has indicated their count is complete. Acquire their figures to add to the Department's total.

v) Total all textiles counted, and add in the one par that is in use in the guestrooms. This total is the circulating inventory.

vi) Input the inventory figures into the master inventory sheet to determine your +/- par level for each item.

vii) The next month's textile requisition must then satisfy any areas of deficiency. The purchase is intended to maintain the required par level at all times.

Objective

The objective of conducting inventories is to ensure an accurate physical count of in-circulation and reserve quantities of textiles in order to prepare accurate budget requirements and to analyze and investigate actual losses.

II. ROOM TEXTILES

A. Procedure

1. Well ahead of the inventory date, a memo is sent to all concerned so rearrangement and/or scheduling of working hours can be made in time, especially in the Laundry, where more staff is probably needed to finish washing, stocking and counting of all textiles.

2. Pre-numbered inventory count cards are checked by an Inventory Clerk to ensure that no number is missing. They are then distributed to the appropriate departments before the inventory date.

3. Prior to inventory of equipment in circulation, stock inventory is taken by an Inventory Clerk and the Supervisor of the General Storeroom.

In case of discrepancies between actual stock count and cardex, all entries are checked against requisitions and/or receiving records. Date of inventory and actual count is entered in red onto proper cardex card. After finishing the stock inventory, no merchandise is issued until the equipment in-circulation inventory has been finished. In case of extreme necessity, the requisition to issue items is forwarded to the Inventory Clerk immediately so it may be deducted from circulation count in order not to be counted twice.

4. On inventory day, all guest rooms' soiled textiles is sent to the Laundry -- none of it left behind -- and all rooms set up to par. It is important that Room Attendants' trucks be free of any textiles, used or clean.

5. All Floor Linen Closets are properly and neatly stocked and a list made showing quantities of all inventory items in each closet, floor-by-floor, so checking can be done easily and accurately. This usually takes place before Evening Room Attendants start work.

6. All soiled textiles in the Laundry are washed, folded and neatly stacked into equal piles. It is counted, and Inventory Count Cards are made out (usually by the Laundry Manager or Assistant) with item stock number, description and quantity. The textiles and cards are placed in the proper piles so they can be conveniently counted and checked. The count and description is checked by the Inventory Clerk with help from the Accounting Office, and the cards are picked up for later tabulation.

7. All cards are put in numerical sequence and checked frequently to be sure no number is missing. It is easier to find a misplaced card immediately than hours later. No card, under any circumstances, is destroyed, including those which are void. No textiles are to be taken out from the Laundry until all are checked and the cards are picked up.

8. In the Housekeeping Department, cards are made out for all spare textiles, blankets, bedspreads, etc. which may be kept there. Items retained for repairs in the sewing room are checked carefully prior to inventory. Those items which cannot be repaired are discarded and entered into the Discard Record before inventory date. For those reparable items, cards are to be made out in the usual manner.

9. Bedspreads sent out for cleaning are kept track of and added to the inventory list.

10. Guest rooms are set up to par and a list made out for all inventory items, floor-by-floor, taking into consideration rooms being redecorated and/or otherwise out of order and stripped. The list is forwarded to the Inventory Clerk as soon as possible.

11. After the inventory working sheets are completed by the Inventory Clerk, consumption figures are available for those concerned.

12. Rooms Textile Inventory form is completed by the Director of Housekeeping.

III. OUTSIDE LAUNDRIES

Inform the Laundry well in advance of the date of the inventory. Request that it clear any backlog and return all textiles on the day of the inventory. If this is not possible, it should count what it is holding. Count the soiled textiles prior to it being sent out on the day of the inventory.

IV. TEXTILE INVENTORY KEY POINTS

A. Housekeeping -- Room Textiles

1. Decide on cut-off hour.
2. Tape linen chutes.
3. Prepare guest room textile par master list.
4. Deduct O.O.O. rooms if textiles were removed.
5. Count soiled textiles left on floor.
6. Remove textiles from Room Attendant's Cart.
7. Count textiles in Floor Linen Room control closet.
8. Count textiles in Main Linen Room.
9. Count textiles out for repairs.
10. Count textiles in Storeroom.

B. Laundry

1. Decide on cut-off hour.
2. Separate and count soiled textiles.
3. Send clean textiles to Main Linen Room.

4. Use inventory count cards.

C. Accounting

1. Count textiles in Storeroom.

2. Spot-check Housekeeping and Laundry textile count.

3. Collect inventory count cards.

4. Process inventory and send results to departments concerned.

In most of our hotels, the Accounting function is also handled by Housekeeping at this point.

IV. ROOMS TEXTILE INVENTORY -- EXCEL WK1 INVENTORIES

This section includes a description of each of the 24 columns contained on the Rooms Textile Inventory provided. Columns A-F need only be completed out once for each individual hotel, using its own specific data. Once this information has been developed on the program, it is not to be changed unless a modification to the in room stock section is changed as a matter of policy. If this occurs, the entire form will then have to be recalculated.

This program is designed so that all of the basic information can be recorded on it, leaving only columns H I L M Q U W to be completed at the time that each physical inventory is taken. All other columns will calculate automatically. This program will generate the number of each item which must be purchased in order to maintain proper inventory levels (if physical inventory is accurate).

Losses for a period of 22 months are taken into consideration in the budget calculation. Twenty-two months losses are required because sufficient textiles has to be in reserve or budgeted for the purchase for the 6 months remaining in the inventory year, the 12 months of the budget year and the first 4 months of the year after the budget, since textile deliveries are seldom received before April in any given year.

Column descriptions are as follows:

Column A — Size. Includes the sizes of each room textile item used by your hotel.

Column B — Item. Identify each individual item.

Column C — In Room Stock. Lists how many items are needed to set up each room once.

Column D — 100% Per Unit. Includes the standard unit requirements for each item listed.

Column E — Five (5) Day Circulation Percentage. This percentage figure is the number of pars (100% per unit) needed to operate. It is based on the Laundry's operating five (5) days per week at 100% occupancy.

Column F — Circulation Formula. The circulation formula is developed by multiplying Column D times the specified unit factor times Column E as applicable.

Circulation Formula Example: Single Sheets

Form: SB X 2.2 X 300% + extras = quantity required.

Where:

SB	Number of single beds.
2.2	2 sheets per bed X 100% (if 3 sheets are used per bed, it would be 3.3).
300%	6 day Laundry operation.
Extra's	Total from (A) and (B) if applicable.
Quantity Required	The amount of this item which must be maintained in circulation to ensure efficient operation.

Column G — Blank.

Column H — Actual Inventory. When the physical inventory of textiles in- circulation is taken, the in-circulation figures only should be recorded in this column for the corresponding line item.

Note: The current operating status of the textile inventory can be determined by comparing Column G and Column H.

Column I — Storeroom Inventory. The quantity of textiles (new unissued) in the Storeroom at the time that the physical inventory is taken. This column will decrease each month as textiles are issued. (For monthly issue quantities, see note under description of Column P.)

Column J — Total on Hand (Current Period). Total of Column H plus Column I.

Column K — Blank.

Column L — Opening Inventory (Prior Period). Transfer Column J from prior Textile Inventory. (Ensure that it is taken from inventory period with the same number of months in it.)

Column M — Purchases Received (Prior Period). Record quantity of each item received during prior period.

Column N — Total on Hand (Prior Period). Total of Column L plus Column M.

Column O — Blank.

Column P — Actual Loss. The difference of Column J minus Column N.

Notes:

A) This quantity divided by the number of months in the inventory period determines the monthly issues from the Storeroom.

B) Loss Experience -- If it is discovered that the loss rate is substantially higher than expected, the actual losses must be reflected accordingly. Care must be taken not to try to control textile security by an arbitrary reduction in the textiles purchased for the operation. It must be obtained from the Comptroller.

C) Interim inventories can be used to adjust quantities of textiles placed into circulation (issued).

Column Q — Official Discards. The official discard records are totaled for each item and the totals entered into this column. This is a comparison only and shows what percentage of losses were through official discards. In the perfect situation, Column P and Column Q are equal. Large discrepancies indicate pilferage, abuse, etc. and should be investigated.

Column R — Unaccounted Losses. Difference between Column P and Column Q.

Column S — Blank.

Column T	Required Replacement. Column F-J provides us with the difference of what should be in circulation and what is actually on hand.
Column U	On Order. Here we need to record items ordered but not yet received.
Column V	New Order. The difference between required replacement and what is already on order.
Column W	Price Per Unit. Enter here your current cost. Make sure you add purchasing fee, taxes and freight.
Column X	This column calculates the cost of needs to be ordered now.

SUMMARY

This form and the standard factors contained thereon are designed to automatically develop textile inventory standards. The three (3) factors which are determined by each local hotel are:

a) Units

b) Actual textile consumption for order period

c) Number of days which the Laundry operates

When these three (3) factors are developed, the form for each hotel can be completed through Column 7 and duplicated for use with each subsequent physical textile inventory.

Items sewn in house such as pillow cases from sheets or single sheets from king sheets are recorded in Column 12, "Purchases Received".

V. FOOD AND BEVERAGE LINEN INVENTORY INFORMATION SHEET (HOUSEKEEPING MANUAL)

This section includes a description of each of the forms, Schedules L-2, L-3 and L-4. Schedule L-2 and Schedule L-3 need only be filled out once for each individual hotel by the Food and Beverage Manager using its own specific data. Once this information has been developed on the form, it is not changed unless a modification occurs as a matter of policy. If this occurs, the entire form is then recalculated.

Schedules L-2 and L-3 are designed so that all of the basic information can be recorded on them, leaving only Columns 7 through 15 on Schedule L-4 to be completed at the time that each physical inventory of Food and Beverage linen is taken.

Columns 16 through 20 are used for budget purposes only. This form, Schedule L-4, will generate the number of each item to purchase in order to maintain proper inventory levels (if the physical inventory is accurate). All textile quantities are shown as pieces. The calculation after the June inventory is used for the preparation of the annual budget.

Losses for a period of 22 months are taken into consideration in the budget calculation. Twenty-two months losses are required because sufficient linen has to be in reserve or budgeted for purchase for the 6 months remaining in the inventory year, the 12 months of the budget year and the first 4 months of the year after the budget, since textile deliveries are seldom received before April in any given year.

VI. Food and Beverage Linen Inventory Information

A. Restaurants -- Schedule L-2

This schedule is used for determining the information for each restaurant necessary to calculate its textile requirements for a 24 hour period. Each restaurant is identified by name and included in one of the four sections on each page of Schedule L-2. Note that Room Service is considered a restaurant for inventory purposes and is included on Schedule L-2.

B. Function Rooms -- Schedule L-3

This form is used for all function rooms. Function rooms are defined as those areas of the hotel which are normally used for banquets. This schedule is used for determining the information necessary to calculate all function rooms' textile requirements for a 24 hour period. The calculation is based on the number and sizes of function room tables and highest average daily covers. Use a separate line on Schedule L-3 for each color, size and fabric type of Food and Beverage linen used in the function rooms of the hotel. For the purposes of the form, the "primary color" is defined as the most frequently used color of textiles used in function rooms.

C. Schedule L-4

Schedule L-4 is a summary sheet where the information for Food and Beverage linen of like size, fabric type and color is totaled and analyzed to determine whether sufficient linen is available to maintain the required level of textiles in circulation.

D. Schedule L-2 -- Column Descriptions

Column 2a — Size. The size of each type of table used in named outlet, restaurant or Room Service, in inches or centimeters.

Column 2b — Number. The number of each size of table in named outlet.

Column 2c — Seats. The number of places set at each table.

Column 3a — Color. The color of the tablecloth used on each table in each outlet.

Column 3b — Size. The size of the tablecloth used for each size table in each outlet.

Column 3c — Fabric. The fabric type of the tablecloth used in each outlet.

Column 3d — Turns. The turns are the total number of times linens are placed on the tables of each outlet per 24 hour period with maximum usage. This figure may vary according to outlet and size of table.

Column 4 — 24 Hour Linen Par. One par is 110% of the sum of the linen requirements for each restaurant. The formula for this calculation is the quantity of each item in Column 2b times the number of turns in Column 3d times 110%. The formula for calculating the napkin and placemat par is Column 2c times Column 3d times 110%. The extra 10% is an allowance for soiled or damaged textiles.

Column 5a — Five (5) Day Laundry Percentage. These percentages are to be used to determine the amount of textiles required in circulation for a hotel whose Laundry operates 5 days per week.

Column 5b — Six (6) Day Laundry Percentage. These percentages are to be used to determine the amount of textiles required in circulation for a hotel whose Laundry operates 6 days per week.

Note: Only Column 5a or 5b, as applicable, is used. It is recommended that a line be drawn through the column which is not applicable to your hotel.

Column 6 — In-Circulation Formula. This column is allowed for the calculation necessary to determine the quantity of textiles required in circulation. The formula for the calculation is the quantity of each item in Column 4 times either the percentage in Column 5a or 5b.

Column 7 — Required. This column is for the result of the formula calculation of Column 6. This figure shows the in-circulation requirement for each item. This is the quantity which must be maintained to meet the restaurants' requirements.

E. Schedule L-3 -- Column Descriptions

Column 2a — Size. The size of each type of table used in the function rooms, including restaurants used as function rooms.

Column 2b — Number. The total number of each size of table used in all the function rooms.

Column 2c — Seats. The number of places set at each table.

Column 3a — Color. The colors of the tablecloths used in the function rooms.

It is assumed that a hotel will have the following mix of colors in their banquet linen:

Primary Color	Sufficient to cover all banquet tables.
Secondary Colors	Sufficient of the second most popular color to cover all banquet tables.
	Sufficient of the remaining secondary colors to set up the main ballroom.

It is recommended that a maximum of 3 colors be used in banquets.

If a hotel uses only one color of linen in its function rooms, the 5-day Laundry percentage should be increased to 330% and the 6-day Laundry percentages to 300%.

Column 3b — Size. The size of the tablecloths used for each size of banquet table.

Column 3c — Fabric. The fabric type of the tablecloths used in the function rooms.

Column 3d — Factor. This factor has been developed to correlate the amount of linen required according to quantity of banquet tables with the volume of business of the Banquet Department. The factor is calculated as follows:

$$\text{Factor} = \frac{\text{Highest Average Daily Covers}}{\text{Total Seating Capacity}}$$

NOTES:

To obtain the figure of Highest Average Daily Covers, review historical statistics to reveal volume of business on normal busy days. This figure must not equal the highest number of covers served in one 24 hour period.

To obtain the figure of Total Seating Capacity, total the number of seats in Column 2c for primary colors.

Column 3d, tablecloths, is obtained by multiplying Column 2b by the calculated value of the factor.

Column 3d, napkins, is obtained by multiplying Column 2c by the calculated value of the factor.

Column 4 — 24 Hour Linen Par. One par is 100% of the sum of the textile requirements for each function room. The formula is the quantity of each item in Column 3d times 110%. The extra 10% is an allowance for soiled or damaged textiles.

Column 5a — 5-Day Laundry Percentage. These percentages are to be used to determine the amount of linen required in circulation for a hotel whose Laundry operates 5 days per week.

Column 5b — 6-Day Laundry Percentage. These percentages are to be used to determine the amount of textiles required in circulation for a hotel whose Laundry operates 6 days per week.

Note: Only Column 5a or 5b, as applicable, is to be used. It is recommended that a line be drawn through the column which is not applicable to the hotel.

Column 6 — In-Circulation Formula. This column is allowed for the formula necessary to determine the quantity of textiles required in circulation. The formula is the quantity of each item in Column 4 times either the percentage in Column 5a or 5b.

Column 7 — Required. This column is for the result of the formula calculation of Column 6. This figure shows the in-circulation requirement for each item. This is the quantity which must be maintained to meet the function rooms' requirements.

F. Schedule L-4 -- Column Descriptions

Schedule L-4 provides a summary sheet where the information of table linen of like size, fabric and color is to be totaled and analyzed to determine whether sufficient linen is available to maintain the required level of textiles in circulation. It is filled out by the Accounting Department after the bi-annual inventory and checked by the Director of Housekeeping. The information for the first four (4) columns, plus Column 7, should be typed onto the form.

Column 7 — This column is developed by consolidating the information in Column 7, on Schedules L-2 and L-3, according to size, color and fabric type of Food and Beverage linen. This is the quantity of each item which must be maintained to meet the hotel's in-circulation requirement.

Column 8 — Actual Inventory. When the physical inventory of textiles in-circulation is taken, the in-circulation figures only are recorded in this column for the corresponding line item.

Note: The current operating status of the textile inventory can be determined by comparing Column 7 and Column 8.

Column 9 — Storeroom Inventory. The quantity of textiles (new, unissued) in Storeroom at the time that the physical inventory is taken. This column will decrease each month as textiles are issued. (For monthly issue quantities, see Note under description of Column 14.)

Column 10 — Total On Hand (Current Period). Total of Column 8 plus Column 9.

Column 11 — Opening Inventory (Prior Period). Transfer Column 10 from prior inventory summary.

Column 12 — Purchases Received. Record quantity of each item received during prior period.

Column 13 — Total On Hand (Prior Period). Total of Column 11 plus Column 12.

Column 14 — Actual Loss. The difference of Column 13 minus Column 10.

Notes:

A) This quantity divided by the number of months in the inventory period determines the monthly issues from the Storeroom.

B) Loss Experience -- If it is discovered that the loss rate is substantially higher than expected, the actual losses must be reflected accordingly. Care must be taken not to try to control textile security by an arbitrary reduction in the textiles purchased for the operation.

C) Interim inventories can be taken and used to adjust the quantities of textiles in-circulation.

For example: If a quantity in Column 8 exceeds the quantity in Column 7, no issues are made from the Storeroom for that item until the quantities in both columns are back in balance. If Column 8 is substantially lower than Column 7, linen is put into circulation from reserve immediately unless there are extenuating circumstances such as very low occupancy.

Column 14a — Official Discards. The official discard records are totaled for each item and the totals entered into this column. This is a comparison purposes only showing what percentage of losses were through official discards. In the perfect situation, Column 14 and Column 14a are equal. Large discrepancies indicate pilferage, abuse, etc. and should be investigated.

Column 15 — In Transit. The amount of linen which has been ordered but has not been received is recorded for each appropriate line item.

Column 16 — Total Required. The sum of Column 7 and Column 14, and used for budget preparation only.

Notes:

A) The quantity in Column 7 (required in-circulation) remains the same; the quantity in Column 14 varies, depending on the actual textile losses.

B) The quantity of linen to be purchased for initial reserve levels is based on past consumption history and order periods.

Column 17 — Total Actual. The sum of Column 10 and Column 15.

Column 18 — Purchases. The difference of Column 16 minus Column 17. (If Column 17 is larger than Column 16, enter a zero [0] in Column 18.)

Column 19 — Unit Prices. Current unit price to be obtained from purveyor.

Column 20 — Total Cost. Multiply Column 18 times Column 19.

SUMMARY

This form which contains standard factors is designed to automatically develop textile inventory standards. The three (3) factors which are determined by each local hotel are:

a) Units
b) Actual textile consumption for order period
c) Number of days which the hotel's Laundry operates.

When these three (3) factors are developed, the form for each hotel can be completed through Column 7 and duplicated for use with each subsequent textile inventory.

Note: Items sewn in house, such as napkins and tablecloths, are recorded in Column 12, Purchases Received.

The calculation for the function rooms is based on the following information:

Maximum Seating Capacity	500
Ballroom	350
Meeting Room A	80
Meeting Room B	35
Meeting Room C	35
Highest Avg. Daily Covers	800

BUDGETS

I. POLICY A-A-8

The preparation of the annual plan is a combined effort of a committee chaired by the Manager, which may consist of the Comptroller, Sales Manager, Front Office Manager, Chief Engineer, Purchasing Agent and Operations Comptroller. It consists of four budgets: Furniture, Fixtures & Equipment, Operating Equipment, Uniforms and Profit Budgets.

The first step is the computation of the occupancy and average rate by the Front Office Manager and Sales Manager. The Director of Housekeeping assists the front Office Manager in conjunction with the Executive Assistant Manager or Rooms Division Manager in the preparation of the Rooms department profit and loss statement (i.e. the Profit Budget) which includes payroll and departmental expenses such as guest and chemical supplies and stationery. The payroll is forecasted on a daily basis from the detailed occupancy forecast provided by the Front Office Manager and includes fixed and variable job categories.

The Director of Housekeeping must also provide the Manager with a detailed listing of Furniture, Fixture and Equipment requirements. These requirements will be reviewed by the Chief Engineer and priced by the Purchasing Agent. The type of items to be included in the FF&E Budget are:

A. Furniture and furnishings, which shall include guest room, office, public area and other furniture, carpeting, draperies, lamps, decorative fixtures and other items.

B. Hotel equipment which shall include all equipment required for the operation of laundries, dry-cleaning facilities, office equipment, material handling equipment and cleaning equipment.

Obviously this is done in accordance with the renovation program established for the hotel.

Utensils such as coat hangers, waste baskets, cleaning utensils, flower vases, etc. are not to be included in the FF&E Budget. These are charged to the department's Operating Budget.

The Director of Housekeeping has to prepare an Operating Equipment Budget for textiles and uniforms. This is done by completing Schedule L-1, Rooms Textile Inventory, basing the losses on either 18 or 22 months depending upon when deliveries of the goods may be expected. The Uniform Budget is prepared by following the procedure in SP-004, Operating Equipment & Uniforms and completing Forms A and B.

II. TEXTILE QUANTITY

The amount of textiles in-circulation and in reserve is an essential consideration in achieving good guest service, efficient Laundry and Housekeeping operations and containing utility costs. Low textile quantities in-circulation is one of the major factors which lead to inefficient textile service in hotels. Excessively high textile quantities in-circulation results in poor rotation of textiles and encourages abuse and may have a negative effect on Laundry productivity.

A. In Circulation
This is the amount of textiles necessary to meet the hotel's needs at 100% occupancy, subject to the Laundry's operating work week. Under no circumstances should the in-circulation textiles be allowed to drop below the figure in Column 7 on the Inventory Schedule in this section. The inventory must be increased as the number of days that the Laundry operates decreases.

B. In Reserve
The quantity of textiles to be purchased for initial reserve levels is based upon anticipated losses for the time between textile deliveries. The reserve levels should be approaching zero (but never reaching it) when a new textile order is received.

When doing the budget calculation after the mid year inventory, anticipated future losses must be taken into consideration. The amount to be purchased depends on the total actual (Column 17) and the losses expected from the time of inventory (e.g. June '83) to the end of that year, the whole of the budget year (e.g. 1984), and the time in 1985 until the 1985 order can be expected to be received. For example, if textile deliveries of the 1985 budget are received in January 1985, 18-month losses would be used in the budget calculation. But if delivery cannot be expected before April 1985, then the calculation is based on 22 months (June - December 1983, 12 months 1984, and 4 months 1985).

C. Insertion of Reserve Textiles into Circulation -- Textiles must be periodically added to the circulating quantities from reserve to maintain adequate levels. The withdrawal of textiles from reserve must be based upon three factors:

1. Consumption History
Monthly textiles are withdrawn from reserves and added to the in-circulation textiles based upon the consumption history -- Column 14 divided by the number of months in the prior period.

2. Physical Inventories
Quarterly inventories are to be taken and accurate adjustments must be made when the official physical textile inventory is taken.

3. Occupancy
If a hotel experiences dramatic changes in occupancy from one season to the next, the withdrawals will vary accordingly.

However, it must be stressed that the actual in-circulation quantity must never fall below the requirement.

The textile inventory forms may be used for two purposes:

1. Inventory for the period concerned

2. Budgetary purposes

TEXTILE CONTROL

A textile control program begins with the selection of textiles and ends when textiles are condemned or disappear. It must include all phases of laundry and textile service and specifically cover the duties and responsibilities of all persons and all departments in the laundry. There are four aspects to effective textile control -- why, when, what and how much. Each one of these requires attention; failure to address each will equally result in unsatisfactory laundry service.

I. WHY

The reasons for maintaining specific textile inventory levels must be fully understood to avoid the mistake of rationalizing textile shortages. These rationalizations can best be expressed in the four arguments most commonly encountered. These statements are absolutely false.

"Low inventories control losses."

Hotel security is beyond the control of the laundry. The amount of textiles in-circulation cannot have an effect on textile loss through guest theft. If losses are the result of employee theft, a better system of controls on linen closets, new textile storage and the Laundry Department is imperative.

"Low occupancy rates reduce textile inventory requirements."

There is a minimum textile inventory requirement for hotels. For example, if textile supply is maintained below this level and the hotel runs for just two days at 100% occupancy, the laundry will have to operate extra hours and additional days to produce the work required. Subsequently, Engineering must provide additional coverage, and Housekeeping service to the rooms will be delayed since the textiles will not be available to make up the rooms. Also, supervision will be severely taxed during peak periods and there will be inefficient equipment usage in the laundry during low occupancy periods.

"Extending the laundry work schedule reduces costs by reducing textile inventory requirements."

When the laundry is required to operate more than a normal 40 or 48 hour work week to keep the insufficient textile inventories in-circulation so that rooms can be made up, practically every department in the hotel suffers Housekeeping is delayed in making up rooms; Maintenance must run boilers, air compressors, etc., longer; energy usage and costs are increased; the Front Desk must explain to guests why they are required to check into rooms which have not been made up; Food and Beverage may have to mix colors for special functions; and Sales may not be able to sell a banquet requiring a specific napery color. The laundry will probably not have adequate supervision during a portion of its operating period.

"Low inventories reduce textile costs."

The exact opposite is true. Inadequate textiles in-circulation will result in more severe wash formulas, less critical inspection, faster wear-out and inefficient equipment usage. Adequate inventories are necessary to control textile costs.

Time and time again it has been proven that low inventories drastically increase the cost of a hotel's operation. Inventory shortages result in:

* Overtime
* Extended work schedules
* Excessive use of utilities
* Inefficient laundry supervision
* Poor quality textile inventories
* Severe wash cycles
* Reduced textile inspection

We have never seen any study which advocates the maintenance of a textile inventory below that necessary to operate a hotel for a three-day period.

II. WHEN

When to purchase textiles is largely a local decision dependent upon delivery times, budgetary policies and status of existing reserves.

Delivery times must be ascertained and allowed for. At the time the textile order is placed an estimate of the textile loss for the "lag time" (time between order and delivery) must be projected and added to the order. Physical textile inventories should be scheduled to coincide with the development of the textile purchase order. Current "lag time" is about three months.

A. Budgetary Policy

Various hotels purchase textiles sufficient for anywhere from six months to two years. The decision is of little consequence to the laundry so long as adequate quantities of textiles are provided.

The advantages to purchasing textiles for long periods are:

* Ten years ago inflation made this a very profitable practice

* More time is allowed for adjustment to textile orders for specific items that may have been ordered too conservatively

The disadvantages are:

* Recently textile prices have decreased

* If an item is over-ordered the hotel will have to store and carry it on inventory for an extremely long period of time

* If the textile budget is limited, funds may not be available for supplemental orders of those items which were under-ordered. Funds may have been over-expended for other items purchased in excess.

* The likelihood of underestimating the money necessary to meet the textile needs for a long period of time is much greater than if the purchase is for shorter periods. When ordering for a long period of time there is a tendency to order reduced quantities and say, "We will supplement it next year." Supplementary purchases seldom occur in sufficient time.

III. WHAT

Purchase specifications for textiles have been determined by our hotels.

IV. HOW MUCH

The quantity of textiles to be purchased to meet the hotel's need must be determined by a formula which considers two types of inventories:

* The amount of textiles in-circulation

* The amount of textiles in-reserve required for replenishment of the circulation inventory until the next textile order is received.

As has been maintained throughout this manual, one of the major problems found in hotels is an inadequate textile inventory in-circulation. The major cause of this problem appears to be the absence of a workable technique for determining textile requirements. The formula for figuring your hotel's textile requirements are based upon variables unique to your hotel:

One par equals:

* The number of days the laundry operates/delivers

* The size of the hotel

* The number of beds

* The standard guest room set-ups

In-circulation quantities for a 24-hour period should be set according to calculation with no variation, without written justification.

V. OBJECTIVES

Textile expenses represent a sizable portion of the Laundry and Housekeeping budget.

Management must focus on textile control and conservation in its efforts to reduce or control operating costs. Establishing a textile control and conservation program or critically analyzing the present program is required to maintain costs at a reasonable level.

An effective conservation and textile control system helps reduce losses and extend the wear life of the textiles in use. The objectives of a textile control program are:

1) To provide the best Laundry and Textile service at the lowest possible cost.

2) To provide the correct textile item in the right department in sufficient quantities at the right time.

3) To select and purchase the items which best meet the needs of the using departments.

4) To standardize items as much as possible.

5) To guard against improper use of textiles.

6) To establish security measures to reduce theft of textiles.

7) To control textiles by adequate and accurate records.

To obtain the maximum benefit from a textile control program and successfully reach its goals, the following areas must be considered:

A. Standardization and Selection of Textile Items

It is important that a thorough analysis be made of each item used by the various departments. Consider which items are the best and most economical. Often items in use are acceptable but more costly than alternative items which would serve the same purpose. Investigation may reveal that a high priced item is being used, but due to its loss ratio, a less expensive item would better serve the needs of the using department. For example, there is little doubt that heavier, more expensive, better quality face cloths have more appeal.

But due to the high loss ratio of this item, a lighter weight, less expensive cloth is more economical to use.

On the other hand, purchasing the cheapest textile item does not always save money. Balancing purchase price against actual cost requires careful study. The higher priced item can be less costly in the long run because of extended wear life. The cost of processing and our high standards must also be considered in the selection of the item.

It is also helpful to standardize as many items as possible. By standardizing, the cost of sorting and keeping items separated is eliminated. For example:

1. In a hotel with a nominal quantity of single beds, double sheets may be used, thus eliminating the need to purchase single sheets. The same applies for queen and double sheets.

2. Reduce the number of colors used by banqueting and use the same linen in restaurants.

B. Establishing Accurate Textile Requirements

It is essential to determine accurate textile quotas for all departments where textile is used. The quota is established on the maximum 24-hour requirements of the department.

Established 24-hour par requirements provide several advantages and are the basic key for controlling usage:

1. They ensure that each area receives an adequate supply of textiles.

2. They provide an easy way to calculate how much each area is to receive.

3. They indicate any abnormal usage of textiles by an area. They pinpoint the areas where textiles are being lost and wasted.

The importance of making an accurate calculation of textile requirements cannot be overstressed. Too many textiles in-circulation may result in the following problems:

1. Poor stock rotation.

2. Abuse.

3. Low productivity in the Laundry.

4. Tied up capital.

Too little textiles in-circulation may result in the following problems:

1. Extended Laundry operation hours.

2. An increase in Laundry costs, especially payroll.

3. A decrease in Laundry productivity and efficiency because partial loads may be washed.

4. Decreased productivity by Room Attendants waiting for textiles.

5. A hoarding of textiles by Room Attendants.

6. A shortening of useful life of textiles because they cannot rest the required time.

Therefore, it is important to keep the quantity of textiles in-circulation up to par by issuing new textiles from reserve on a monthly basis.

C. Conservation of Textiles During Use

Textiles are handled and used by many people for many purposes. Any textile control and conservation program depends on the full cooperation of all those involved. The program must explain how the items are to be handled and used and stress the importance of avoiding the misuse and abuse of textiles. Some ways to reduce textile damage, abuse and losses are:

1. Training -- Make employees aware of the cost.

2. Supply efficient cleaning rags to employees. (Remember, no-iron textiles are not good cleaning rags since they are not absorbent.)

3. Check for sharp and rough edges: banquet tables, room service tables, beds, couches, Room Attendant's carts and textile shelves.

4. Insist that stained and torn textiles be set aside and brought separately to the Housekeeping or Laundry Departments. If this practice is not followed, the textiles will be unnecessarily washed and put back into circulation.

5. Do not let textiles lie on floors. The fibers get damaged just by being stepped on.

6. Put restrictions on textiles being used by employees. Use discarded guest room towels for employees and supply the Cooks with neckties.

7. Inspect employees' locker rooms.

8. Control textile issue and return. "Soiled for Clean" is the recommended system.

9. Inspect the linen chute periodically:

    a) Use plastic bags filled with pillows.
    b) Put carefully into chute on top floor.
    c) Inspect plastic bag in the chute room.
    d) If you see snags, there is a possibility that your chute is damaged.
    e) Start with the lowest floor.
    f) Inspect bag.
    g) Continue to check every floor until you have found the damage.
    h) Report this to your Engineering Department and insist that it is repaired immediately. (Discontinue use of the chute until it is repaired.)

10. Use pillow cases which are slightly stained as inner slips.

11. Identify sheets which have a stain on the top or bottom only and are otherwise in good condition by a different colored stitch along the hem. Use them as bottom sheets.

12. The only way to control abuse of Food and Beverage Linen is to establish systems which prevent this linen from going into the kitchen.

13. Cut and sew discarded table linen into items such as runners, or basket, tray and trolley liners to avoid the use of tablecloths and napkins.

14. Make only one individual responsible for handling and recording discards.

15. Keep linen closets clean and free of any medicinal or cleaning agents which could leak or spill and cause damage.

16. Make sure that foreign objects are not in the linen when sent to the Laundry. These objects may cut or tear the textiles and reduce the wear life.

17. Make sure that Floor Linen Rooms are locked at all times to discourage theft.

18. Keep Room Attendant's cart halfway across the door so no one will be tempted to take anything off the cart.

19. Separate damp or wet stained textiles and process quickly to avoid mildew or spread of the stain.

20. Train Room Attendants in the correct way to strip beds so they do not tear sheets or strain fibers.

21. Provide receptacles or bags in each Floor Linen Room for textiles needing repair or rewashing.

Any textile conservation and control program should emphasize the need for continued training for all the personnel handling or using textiles.

VI. TEXTILE CONTROL PROCEDURES

A. Linen Control Closets

Each section of the Linen Control Closet holds a 24-hour textile requirement. The shelves are clearly marked with the 24-hour par requirement for each item in that closet. The Room Attendants' carts are stocked from the open section and the other section remains locked for use the following day. Any textiles remaining on a Room Attendant's cart at the end of the day is unloaded and returned to the same section of the Linen Control Closet from which it was taken. The Evening Room Attendant's cart is filled from this same side.

The Day Floor Supervisor makes certain that the Day Room Attendants' carts have been emptied and the Evening Room Attendants' carts have been filled. She then makes a physical count of the textiles that remains. The difference between the par stock and the physical count is the textile requisition. The Floor Supervisor hands in this textile requisition to the Linen Room before going off duty.

B. Benefits:

1. Facilitates the maintenance of adequate textile pars.
2. Ensures correct rotation -- which is very important for no-iron textiles.
3. Reveals shortages.
4. Avoids overstocking or hoarding of textiles.
5. Frees space in the Main Linen Room.
6. Eliminates traffic on the service elevators during busy periods since restocking can be done at night.

VII. TEXTILE CONSUMPTION RECORD

The Textile Consumption Record is an easy reference for information on annual textile losses.

A. Procedure:

1. After inventory, Schedule L-1, Rooms Textile Inventory, is completed by the Director of Housekeeping.

2. The three month losses calculated in Column 14 are entered into the appropriate column on the Textile Consumption Record.

3. At the end of the calendar year, the 12 month losses are calculated.

VIII. RESERVE TEXTILE STOCK CARD

The purpose of the Reserve Textile Stock Card is to maintain in Housekeeping an independent record of new textiles received and textiles issued from reserve. It shows at all times the quantity of new textiles available.

A. Procedure:

1. A separate card is used for each item of Rooms and Food and Beverage linen.

2. Each time a purchase is received, it is recorded with the date and added to the quantity in the "Balance" column.

3. Each time new linen is issued from reserve, it is recorded with the date and subtracted from the quantity in the "Balance" column.

4. When physical inventory is taken, the quantity in the "Balance" column is verified against the actual physical count of reserve textiles.

IX. FOOD AND BEVERAGE LINEN REQUISITION

The objective of the Food and Beverage Linen Requisition is to ensure that Food and Beverage Linen is issued on a strict soiled-for-clean exchange.

A. Procedure:

1. Each restaurant is equipped with a lockable Linen Control Closet which holds, in two separate sections, the 48-hour textile requirements.

2. At the conclusion of the meal period, or at the specified hours, a requisition is completed by the Dining Room Maitre D'hotel, showing account of the soiled textiles.

3. The soiled textile is returned directly to the Laundry. The restaurant count is double checked in the Laundry and the requisition is countersigned.

4. The requisition is presented to the Linen Room Attendant who issues the clean textiles and records the amount of textiles issued.

FOOD & BEVERAGE LINEN REQUISITION

TO: Laundry Department DAY:

FROM: Restaurant _____ DATE:

	Dirty	Laundry Confirmation	Request	Issued
Napkins				
Tablecloth (size)				
Tablecloth (size)				
Placemats				
Pot towels				
Glass towels				

Captain's Signature:

Laundry Confirmation Signature:

Issuer's Signature:

Receiver's Signature:

X. POOL TOWEL CONTROL SYSTEM

The objective of the Pool Towel Control System is to ensure the return of all pool towels issued to guests.

A. Procedure:

1. The sequentially numbered perforated cards are held by the Pool Attendants. Sequentially numbered cards ensure that no card may be lost.

2. When a guest requests pool towels, he is asked to complete both sides of the card with the following information:

   Date
   Number of towels
   Room number
   Name
   Signature

3. When the guest returns his towels, his card is retrieved, the number of towels returned is verified, and the guest is given the larger half of the card.

4. When the pool closes, all cards are reviewed. Those with both sides of the card intact signify towels not returned.

5. The Pool Attendant sends these to the Front Office Cashier and a charge is posted to the guest's account as stated on the card.

6. All other cards are destroyed at the end of the day.

XI. ANTICIPATED LOSS STANDARDS AND LOSS ANALYSIS

Textile loss consumption is an accepted fact in a hotel operation, since textiles are a perishable item with a limited life span. But while losses are expected it is important to analyze the losses after each inventory to see if they are in line with anticipated loss standards. Our corporate anticipated loss standards for a 6-month period are as follows:

Laundry

Operation

	5 Day	6 Day
Sheets	15%	20%
Pillow Cases	15%	20%
Bath Towels	25%	33.3%
Hand Towels	25%	33.3%
Bath Mats	25%	33.3%
Face Cloths	65%	85%
Pool Towels	50%	65%

Note: The anticipated losses are shown as a percentage of the in-circulation requirement.

These anticipated loss standards are only guidelines. They are inaccurate in certain circumstances. For example, hotels which buy local goods of inferior quality experience higher losses; hotels which have known pilferage experience high losses; hotels which keep sub-standard textiles in circulation too long experience lower losses. When accurate inventories are taken and accurate records are kept for three consecutive years, it is possible for each hotel to tailor these anticipated loss standards to its own operation.

On subsequent pages are several forms and procedures for analyzing the textile loss patterns in an individual hotel.

Note: Loss analysis for room's textiles is necessary only for 7 major items: sheets, pillow cases, bath towels, hand towels, bath mats, face cloths and pool towels.

XII. 6-MONTH TEXTILE CONSUMPTION ANALYSIS

The purpose of a 6-Month Textile Consumption Analysis is to compare actual losses in units and as a percentage of in-circulation requirements to anticipated loss standards.

A. Procedure -- Column Description:

Column 1 — Item
The seven major textile items.

Column 2 — Requirement
Enter the hotel's requirement for each item by copying the figure calculated in Column 7, Schedule L-1, and Rooms Textile Inventory Information.

Column 3	Loss Percentage Enter the anticipated loss percentage for each item from the chart at the bottom of the form. Note: If anticipated losses have already been tailored to your operation, enter your own figures.
Column 4	Units Multiply Column 2 by the loss percentage and divide by 100.
Column 5	6-Month Actual Losses Enter the 6-month actual loss figure for each item by copying the figure calculated in Column 14, Schedule L-1, and Rooms Textile Inventory Information.
Column 6	Requirement Enter the in-circulation requirement from Column 2.
Column 7	Losses in % Multiply Column 5 by 100 and divide by Column 6.
Column 8	Anticipated Loss Units Enter figure in Column 4.
Column 9	Actual Loss Units Enter figure in Column 5.
Column 10	Difference Subtract Column 8 from Column 9.
Column 11	Anticipated Loss % Enter figure in Column 3.
Column 12	Actual Loss % Enter figure in Column 7.
Column 13	Difference Subtract Column 11 from Column 12.

XIII. 6-MONTH ROOMS TEXTILE LOSS AND DISCARD COMPARISON

The purpose of a 6-Month Rooms Textile Loss and Discard Comparison is to compare actual losses with official discards to identify source of losses and to calculate average monthly losses so the correct amount of textiles can be put into circulation to ensure requirement is maintained at the correct level.

A. Procedure - Column Description:

Column 1	Item The seven major items.
Column 2	Anticipated Losses Enter the figure in Column 4, 6-Month Textile Consumption Analysis.
Column 3	Actual Losses 6 Months Enter the figure in Column 5, 6-Month Textile Consumption Analysis.
Column 4	Official Discards 6 Months Enter the figure in Column 14A, Schedule L-1, and Rooms Textile Inventory Information.
Column 5	% Discards 6 Months Multiply Column 4 by 100 and divide by Column 3.
Column 6	Average Monthly Losses Divide Column 3 by 6 (months).
Column 7	Local Prices/Piece Obtain price information from Purchase Order.

XIV. OFFICIAL DISCARDS

It is necessary for every Housekeeping Department to make official discards of Rooms textile, Food and Beverage linen and uniforms. An item may be discarded for any of the following reasons: worn, torn, stained, shrunk, burnt or abused. An official record of discards is kept and the total entered in Column 14A, Schedule L-1, Room Textile Inventory Information, at the time a physical inventory is taken.

Official discards are very useful:

A. 60/40 percent polyester/cotton sheets and pillow cases are not good cleaning rags but may be made into the following:

1. Sheets into pillow cases or inner slips.
2. Pillow cases into inner slips.
3. Sheets into crib sheets and pillow cases.
4. Sheets and pillow cases dyed and used as drop cloths.

B. Terry items, such as bath towels and hand towels, make the best cleaning rags.

C. Mattress pads can be made into Cooks' potholders, pads for silver burnishing or moultons.

D. Tablecloths can be made into napkins, placemats, service cart liners or cloths used by Chefs to decorate trays.

E. 100 percent cotton Food and Beverage linen makes good cleaning rags.

F. Blankets can be cut down to smaller size; for example, into crib blankets.

It is important that all official discards set aside for use as cleaning rags are clearly identified as discards. This can be done either by dyeing, identifying with a different colored thread or stamping.

Note that an extensive study should be prepared before any discards are made into new articles. The labor cost may be higher than the purchase price of a new item.

XV. DISCARD RECORD -- ROOMS TEXTILE

The objective of a Discard Record -- Rooms Textile is to keep an accurate record of the quantity of textiles discarded and for what reason.

A. Procedure:

1. Make only one person responsible for deciding if an item should be discarded. The same person is responsible for recording the discards. The most logical person is the Linen Room Supervisor.

2. Note the reason for the discard and the quantity recorded immediately in the appropriate column.

3. Use a separate sheet for each item -- i.e., single sheets, double sheets, bath towels, etc.

4. At the end of each period, total the amounts in each "quantity" column and enter in the "total" column.

5. Add these totals to give the number of discards during the inventory period.

6. Review the Discard Record periodically to see if a problem exists with the textile.

XVI. DISCARD RECORD -- FOOD AND BEVERAGE LINEN

A. Procedure:
The procedure is the same as for Rooms Textiles. Separate sheets are completed for the different colors and sizes of table linen and napkins. Sizes are essential if losses and replacement quantities are to be developed by specific item.

Note: Send a summary of discards to the Food and Beverage Manager at the beginning of each month.

Highlight those items discarded because of abuse.

I. WHAT TO LOOK FOR AND HOW TO CHOOSE UNIFORMS

A. UNIFORM STYLES

If they place excessive emphasis on concept and image, designers tend to get carried away in creating uniforms, putting their priority on appearance rather than on function. The fact remains that most employees who will wear the creation want comfort first.

Those whose jobs entail carrying heavy suitcases, balancing food trays, or any amount of reaching, lifting and stretching -- waiters, waitresses, bell attendants, room attendants, and maintenance people -- need ample stretch room under the arms, across the back, and around the chest and waist. Clothes that do not have that "give" impair workers' movements and can reduce job performance and efficiency.

Pocket, collar, belt, or sash designs also need careful consideration. Pockets are indispensable to restaurant and hotel employees. They should be roomy enough for a waitress to slip checks into easily and sturdy enough to hold tip change.

Snaps under a collar and at the end of a belt help hold smoothness and prevent puckering or sagging. Tight fitting or stiff collars are not as appropriate for buss people as they might be for waiters, but it is difficult for a waiter to function comfortably if his collar is too stiff.

Housekeeping room attendants need loose-fitting outfits because they do a great deal of stooping, bending and reaching while cleaning. Their physical labor will be more tiring and frustrating if they must constantly smooth or straighten out their uniforms. Beltless, zippered dresses with short raglan sleeves are probably the most comfortable and practical for them and for restaurant waitresses as well.

Belts enhance a uniform's appearance but are a tricky accessory because they are easily lost unless securely fastened to the uniform. Tunneled drawstring belts should be knotted at the ends to prevent them from getting lost inside the folds of the garment. Belts on room attendants' dresses impede their movements.

Easily alterable skirt lengths are another requisite when buying uniforms. It is highly unlikely that stock uniforms will ever be a perfect fit for all; and employees or in-house seamstresses should not have to use needle and thread more than necessary or struggle with ruffles, double stitching, fringe, etc.

Men's uniforms should have reinforced side slots that expand the openings for easy access to pockets. Waiters' jackets need at least one, and preferably two, roomy inside pockets for pencils and checks. Convertible collars fixed with permanent stays are preferred neckwear. Waistbands should be reinforced. Eton jackets worn by waiters and busboys should have interlined collars and fronts for extra body and wrinkle resistance. Cuffs, decorative embroidery, and epaulets are attractive, but there is the possibility of their catching on things and interfering with performance. Such accessories also are susceptible to abrasion, fraying, or simply coming loose. These extras cost more not only to purchase but also to clean and to maintain.

Look with a critical eye at what you *should* expect from the uniforms purchased for your department.

1. *Appearance.* Well-made garments from a uniform manufacturer have fabrics and workmanship that are designed for heavy wear. They stay bright and new-looking through countless launderings. Special soil-release finish resists staining, and the permanent-press treatment prevents wrinkling.

2. *Comfort.* Comfort in uniforms depends on the right fabric, but even more so on good fit. Your staff is active, hard-working people, not mannequins. They have to reach, and bend, and squat. Their uniforms must be designed with ample working room so they do not bind or restrict movement. Every manufacturer's line is a little different, so it is important to refer to their size charts, and preferably have a couple of extra uniforms on hand for a new employee to try on, to assure a comfortable, good-looking garment.

3. *Image and Identity.* You want to create a *desirable image.* The uniform should be eye-catching, smart, efficient and professional. The uniform manufacturers can show catalogs illustrating many different stock styles and colors. Emblems, badges and embroidery can personalize the uniforms, to identify the hotel, the department, and the employee. It is possible to match the decor, so the employee and the uniform reinforce the image of the hotel.

4. *Value.* All too many things are bought by price considerations alone. In selecting uniforms, the Housekeeping and Purchasing departments should seek *value.* Uniforms that look good, are comfortable, and maintain their appearance through a hundred laundry cycles, are certainly more economical -- a better value -- than cheaper garments that just do not perform or hold up.

5. *Reliability.* The uniform manufacturer needs to deliver what its sales representatives promise. *Prompt service, high quality* and *continuity of styles* ... the ability to supply fill-ins when needed are desirable. Examine the company's track record.

II. ESTABLISHING PAR LEVELS OF UNIFORMS

The majority of our staff members wear uniforms. The cost for uniforms can run into the tens of thousands of dollars each year. It is, therefore, imperative to have an effective method of ordering, issuing and controlling uniforms.

In some hotels, each department is responsible for maintaining its own inventory of uniforms. More often, it is the Housekeeping Department's responsibility to handle uniforms -- from purchase to eventual discard. The following section provides guidelines for an effective uniform operation.

The per person par is developed by the Director of Housekeeping and the Laundry Manager (if applicable) in consultation with all departments concerned and with the General Manager's approval. When determining the par level, the following factors are considered:

* Turnaround time for cleaning of uniforms
* How often uniforms need to be changed during the day
* Number of uniformed personnel in each department
* Different types of uniforms in use

To complete the total par, multiply the number of staff members by the number of uniforms needed for each employee. The recommended par levels per person are 3 per staff member, regardless of whether the item is dry cleanable or washable, and 5 for Cook and Steward employees. It is wise for the Director of Housekeeping or responsible department head to have uniform back-up in the event a uniform is lost, worn or destroyed -- 10% is recommended.

A formula for determining the amount of uniforms needed is:

* Number of employees using a particular uniform type x 3 (or 5, as directed) x 10% backup = optimum par of uniforms.

III. THE CALCULATION OF A UNIFORM BUDGET

The objective of the uniform budget is to accurately calculate the annual financial requirements for new uniforms.

This following section is devoted to the preparation of Form 6.6.5. This form is a worksheet, and a separate form is completed for each department that has uniformed personnel (i.e., Food and Beverage, Front Office, Housekeeping, Laundry, etc.). Each job category is completely detailed on the report to facilitate easy exchange of information if a change is made in uniform style.

A. Step one: Column one
This represents the total number of uniformed personnel in the particular job category specified in column two. All part-time and full-time employees are included to get an accurate count. Each department head furnishes a list of employee counts by category to the Director of Housekeeping. It may be necessary to consult with Human Resources in this regard.

B. Step two: Column two
Column two represents job categories for the department represented. For example, the Housekeeping Department may have Clerk, Supervisory, House Attendant, and Room Attendant categories. Each of these are listed in this column.

C. Step three: Column three
This column represents the individual par stock for the job category designated in column two. Most employees will have 3 uniforms. Cooks and Stewards will have 5 each (reference "Establishing a par stock").

D. Step four: Column four
This column represents the multiplication of column one with column three. It is the total needed uniforms before anticipated consumption stock (reference step 8).

E. Step five: Columns five, six and seven
The number placed in column five is the result of the uniform inventory. This is done on a semi-annual basis and includes a count of all stock in the uniform room and laundry.

Column six represents the number of uniforms in use at the time of inventory. In other words, this is the number of uniforms in use when inventory is taken. (It is communicated ahead of time that all uniforms must be turned into the uniform room for inventory unless the employee is working on that day. The Uniform Room Clerk is then responsible to record any outgoing uniforms for the day so that this number can be recorded in column six.

Column seven is the addition of columns five and six. This represents the total number of uniforms by job category in the hotel.

F. Step six: Column eight
This column is the allowance for anticipated discards during the year. Although 10% is an accepted figure for excess stock, it may fluctuate by job category. For example, a steward responsible for cleaning the ovens will require a uniform replacement much more frequently than a Front Desk Clerk. Factors such as these must be considered and numbers adjusted as the age of the uniform increases. All uniforms should be inspected at the time of inventory and substandard items held for discard.

G. Step seven: Column nine
This column represents those items ordered but not yet received. All open purchase orders are compiled and items not yet received recorded by job category.

H. Step eight: Column ten
This column is the addition of column four and column eight. This represents the number of uniforms required to run the operation effectively and is the addition of the total required par to with anticipated consumption.

I. Step nine: Column eleven
This column is the addition of columns seven and nine. This represents the number of actual uniforms in the hotel or on order.

J. Step ten: Column twelve
This column represents the difference between the number of uniforms required and the uniforms actually on hand (column ten minus column eleven). It is this figure that is used when completing the purchase requisition. Note that sizes are estimated so that uniforms are purchased that will be useful in the operation. One of the best ways to do this is to keep track of discard sizes by category. This will be discussed later in this section.

K. Step eleven: Column thirteen
This column represents the cost of each individual uniform. The Director of Purchasing is helpful in providing information in this regard. Note that all freight, fees and taxes are included in the final price to provide accuracy in the total budget.

L. Step twelve: Column fourteen
The final cost for anticipated uniforms is recorded in this column by job category. It is the addition of columns twelve and thirteen. Numbers in this column are added to provide total departmental expense.

M. Step thirteen: Column fifteen
This column represents the uniforms carried in stock (either in circulation or reserve) which are presently unusable or of the wrong design. These uniforms are counted during the inventory but recorded separately.

N. Step fourteen:
The final step in completing the uniform budget is to submit it to the appropriate department head. He/she notes any bulk changes in uniform styles so that this can be calculated into the budget. This is done by multiplying the number of uniformed employees in the specific job category to be changed (column one) by the new price of the uniform selected. Any new plans are noted on the inventory. The final budget is submitted to both the executive office and Comptroller.

THE SUMMARY SHEET

The summary sheet accompanies Form 6.6.5 to the final departments, executive office and Comptroller. An example of this sheet is Form 6.6.18 and is on the next page. This is a summary of all actual figures for the past three years, the forecasted budget for the existing year and the figures from Form 6.6.5.

IV. UNIFORM CONTROL

The objective of the uniform control program is to ensure the return of soiled uniforms, to identify employees who may abuse uniforms and to encourage employees to take pride in their attire. The following steps have been established in order to do this:

A. Issue and control all uniforms through a central location, such as the uniform room.

B. Categorize uniforms by department to save time when employees exchange uniforms at the start and end of each shift.

C. Prepare Purchase Requisition and have appropriate department co-sign the order. Notify the appropriate department upon receipt of new uniforms with a photocopy of the receiving record.

D. Assign each employee a number. Use existing employee number if possible. Record this number on each uniform in a clear but inconspicuous place, according to pars established for the job category. These numbers may be written in by hand in indelible ink on the uniform label, written on tape and sewn in or written on patches and sealed-in using a thermopatch machine.

E. Complete for each employee a uniform issue/return card as assigned by Human Resources during the orientation process. When an existing employee changes job category, an additional card is stapled to the original cardex. The original cardex should be clearly marked when all previous uniforms have been turned in (reference Uniform Records).

F. Note the number assigned to the employee on the cardex and file the cardex in a lock box numerically by job category.

G. Control uniforms by having soiled ones traded for clean ones. In other words, an employee brings his soiled uniform to the uniform room in order to obtain a new one.

   Make a uniform return slip (see Exhibit 6.6.13) available at the uniform counter along with empty clean bags in the event that the uniform room is closed. Employees fill out the card, giving all information required, and place the uniform in the proper drop location. It is desirable for each property to have a drop chute to facilitate the securing of turned-in uniforms after hours. The morning Uniform Attendant checks and logs all late incoming uniforms. When the respective employee arrives for a uniform without a soiled item, the log is checked to verify the returned uniform prior to issue. If the return cannot be verified, the employee must have written permission from his department head or assistant department head.

H. Each employee can only exchange his/her own uniform, not that of another employee. This assists in controlling distribution.

I. When an employee has a uniform that is in need of repair, a simple repair request is made. The employee completes the form when exchanging a soiled uniform for a clean one and the Uniform Room Attendant hangs the repair tag where the clean uniform is usually hung (reference Uniform Records).

J. When an employee is terminated, he/she obtains from the uniform room a verification slip noting that all uniforms have been returned. The Uniform Clerk takes a count of uniforms in the storage room to ensure that all uniforms are accounted for. If a uniform is missing, it is noted on the verification slip and is given to the employee to take to Human Resources.

The issue/return card is completed with the number of uniforms returned and is forwarded to the Human Resources Department. The Human Resources Department coordinates with Accounting to adjust the paycheck of the terminated employee in the event a uniform is missing. It is, therefore, very important that accurate last counts are taken.

K. After termination, all numbers are removed from uniforms, inspected for usability and placed in the residual stock area.

L. When a new employee is hired, the entire process begins once again. Note that a new uniform is not needed. A used uniform can be given out to the incoming employee if sizes are appropriate. Any alterations of a previously worn uniform are handled in the same manner as repair work (reference step 9).

M. A monthly Termination Report is received from Human Resources to ensure all uniforms of terminated employees have been put back in stock.

V. EMPLOYEE UNIFORM RECORDS

The main objective of the Uniform Record is to provide accurate accounting of all uniforms issued to employees and to record sizes and measurements.

A. The Uniform Issue/Return Card
The Uniform Issue Card is a record of the name of the employee, department he/she works in, uniform number assigned, size of uniform and issued quantities by type.

Procedure:

1. The card is made out by Human Resources when a uniformed employee is hired indicating name and department of the employee. The card is forwarded to the Uniform Department before the employee is fitted.

2. The Seamstress fills in the respective information:

   a. Body measurements

b. Amount and kind of garments issued
c. Uniform number assigned

3. The card is signed by the employee to verify the quantity and by the department head to approve the uniform distribution.

4. The card is placed in numerical order by department and job category in a locked card file.

5. The card is returned to Human Resources upon verification of termination and verification of uniforms count. Any discrepancies from the original count should be clearly noted.

VI. The Uniform Repair Request

The objective of the Uniform Repair Request is to alert Uniform Attendants that repairs are needed on uniforms without requiring them to inspect every uniform returned from the laundry.

Procedure:

A. When an employee determines repairs are needed, he/she requests a Repair Request from the uniform room at the time of soiled uniform exchange.

B. The Uniform Attendant hangs the request where the clean uniform is usually hung.

C. After the soiled uniform is returned from processing by the laundry, the Uniform Attendant is alerted by the repair request and sends the uniform to the Seamstress for repair.

D. If the damage is beyond repair, the item is held for discard, recorded and a new uniform issued.

E. All repair requests and discards are regularly inspected by the Director of Housekeeping for seamstress productivity and accuracy.

VII. RECORD OF UNIFORMS RECEIVED

A. Objective

To keep an accurate record and running balance of uniforms received prior to the opening of a hotel and until all orders have been completed. The same procedure may be followed after opening if staggered deliveries are common.

B. Procedure

1. Using the sample form, all uniforms are ordered and the quantities are entered in columns 1 and 2, Item and Quantity, by the size and description. This information is obtained from the Purchase Order.

2. As uniforms are received, the quantity and date are entered in column 3. The outstanding balance is recorded in column 4, "Balance".

   It is possible to see at a glance the quantity, type and size of uniforms not yet received.

3. As soon as all uniforms of one type have been received, a check mark is made in column 5, "Complete".

VIII. UNIFORMS

A. Procedure

1. Determine a cut-off time after which no clean uniforms will be issued. This time is after the evening shift has started work, probably around 7 PM.

2. Instruct all employees to return their soiled uniforms before going off duty on the day of the inventory. Those employees off on the day of inventory return their uniforms on the day(s) preceding inventory.

3. No clean uniforms are issued in exchange for the soiled uniforms on the day of inventory or day(s) preceding. Instead, the employees are given a ticket which they exchange for a clean uniform after inventory.

4. The Laundry is instructed to return all clean uniforms to the Linen Room before the cut-off time. Any uniforms remaining in the Laundry after this time are counted by Laundry personnel.

5. After the cut-off time, the clean uniforms are counted in the Linen Room by Housekeeping. All soiled uniforms returned after the cut-off time are counted in the Linen Room and sent to the Laundry for processing the following morning.

6. During the night, at a time when the least number of people are working, all lockers are inspected and a count made of all uniforms. This count and inspection are done by Housekeeping, Security and Human Resources.

7. Department Heads are instructed to provide Housekeeping with a list of employees working that night and the size of uniform they wear.

8. The morning following the inventory the staffing in the Linen (Uniform) Room is increased to cope with the increased demand for uniforms.

Uniforms are counted by size and design.

Uniforms are inspected and their condition noted in order to calculate anticipated consumption.

New uniforms in reserve are counted on the day prior to inventory by either Housekeeping or Accounting.

Chapter 11
Supplemental Data and Information

ABRASION RESISTANCE
The ability of a fabric to withstand loss of appearance, utility, pile or surface through the destructive action of surface wear and rubbing.

AIR PERMEABILITY
The degree of porosity in a fabric or the ease with which air passes through it.

BED SHEETING
A muslin or percale cotton fabric generally made in widths of 45" to 90" with sizes varying in intervals of nine inches. This is 45", 54", 63", etc.

BLEND
A mixture of different fibers in the same yarn, or yarns of different fibers in the same fabric.

BONDING
A process of pressing fibers into thin sheets or webs that are held together by adhesive chemicals. Non-wovens are bonded.

BROADCLOTH
A term originally indicating a fabric made on a broadloom specifically wider than 27". In the U.S., a fine, closely woven cloth made in plain weave with a fine rib in the filling direction. The filling yarn is heavier and has less twist than the warp yarn. Combed ply yarns are used in the warp and filling in the best qualities. Combed singles or carded yarns are used in cheaper grades.

BURSTING STRENGTH
The pressure required to break a fabric by expanding a flexible diaphragm against a securely held circular area.

CALENDARING
A finishing process used by textile mills. It produces a flat, glossy, smooth surface by passing the fabric under pressure between a series of heated cylinders. The number of cylinders varies. The greater the heat and pressure, the higher the luster.

CELLULOSE
The basic substance which is contained in all vegetable fibers and certain man-made fibers. It is a carbohydrate and constitutes the major part of all plants.

CELLULOSE ACETATE
A chemical compound which forms the material for producing acetate yarns.

CHAFE MARK
A defect in fabric caused by friction in weaving or finishing. The yarn is rubbed until the fibers are drawn away producing a streak or mark in the fabric. Also commonly referred to as a result of dye being removed from one narrow area of the fabric in colored goods. Appears as a line.

CHINO
A twilled cotton fabric made of combed two-ply cotton and vat dyed khaki color. May be blends of cotton and polyester.

CHLORINE RETENTION FINISH
A characteristic of several resin finishes used on textiles whereby some chlorine from bleach used in laundering or home washing is retained in the goods. On heating with an iron, this forms hydrochloric acid, causing the goods to be tendered or destroyed.

COLORFAST
A term applied to dyed or printed yarns on fabrics which do not quickly change color under the normal use for which they were intended.

COMBED YARN
A cotton or worsted yarn that has been combed. Combed cotton yarns compared to carded yarns are more even, compact and have few projecting fibers. Fabrics with finer threads often are made with combed yarns.

COMMERCIAL MOISTURE REGAIN
Arbitrary figure formally adopted as the regain to be used in calculating the commercial or legal weight of textile material. It is expressed as a percentage of the dry weight.

CONSTRUCTION
The term used to describe the details of structure and quality of a fabric or yarn. For example, with cotton gray goods where the construction is given, it includes the gray width of the goods and the number of threads per inch in warp and filling and the number of yarns per pound of the fabric.

CONVERTER
An individual or organization which buys gray goods and sells them as a finished product, to cutters, wholesalers, retailers, and others. The converter arranges for the finishing of the fabric, namely the bleaching, mercerizing, dyeing and printing.

FILL
See definition of WARP and WOVEN FABRICS.

GRAY GOODS
A term applied to woven or knitted fabrics of all fibers in an unfinished state before dyeing or bleaching. Also spelled "grey" or "greige".

HAND
A quality or characteristic of fabric perceived by sense of touch; that is, softness, firmness, elasticity, fineness, etc. Also called "feel" or "handle".

HARD TWIST
A twist which has a larger number of turns per inch than average. In the opinion of some, any number of turns per inch greater than the square root of the yarn count multiplied by four is a hard twist yarn.

JERSEY
A broadly applied name for a plain knitted fabric. It may be made circular, flat, or warp knit of any fiber.

LINEN
Technically LINEN refers to flax fiber fabrics; however, common use of the term "LINEN" within hotels has made the term "LINEN" also mean "TEXTILES". Examples are:

LINEN CHUTE = TEXTILE CHUTE
LINEN ROOM = TEXTILE ROOM
LINEN DELIVERY = TEXTILE DELIVERY
FOOD & BEVERAGE LINENS = FOOD & BEVERAGE TEXTILES

LOOM
A weaving machine which produces fabric by interlacing a series of vertical, parallel threads (warp) with a series of horizontal, parallel threads (filling).

MERCERIZATION
A treatment of cotton yarn or fabric to increase its luster and enhance its affinity for dyes. In the process the material is immersed under tension in sodium hydroxide (caustic soda) solution in the form of warp, skein or in the piece. This later is neutralized in acid. The process causes a permanent swelling of the fiber, thus increasing its luster.

MOISTURE CONTENT
A measure in percentage of the moisture present in textile fiber, yarn or fabric after exposure, under prescribed conditions, to a standard atmosphere having a relative humidity of 65 percent at 70 degrees Fahrenheit as compared to its oven-dry weight.

MUSLIN BED SHEETING
A bed sheeting made of plain weave carded cotton in several different constructions, 56" X 54", 64" X 64", 68" X 72", etc. It is firmly made with strong tape selvages.

NAPERY
Refers to F&B textiles such as table cloths and napkins regardless of fabric from which they are constructed. Today the term table linen is technically incorrect but has become widely used to describe all table cloths and napkins. See LINEN definition.

NO-IRON
Refers to a processing method (without ironing) of an appropriate fabric such as polyester-cotton. Polyester-cotton is not a no-iron fabric but can be processed using the no-iron technique.

NON-WOVEN FABRICS
Assemblies of textile fibers held together either by mechanical interlocking in a random web or mat, by fusing (in the case of thermoplastic fibers), or by bonding with a cementing medium such as starch, glue, casein, rubber latex or one of the cellulose derivatives or synthetic resins.

The fibers may be preferentially oriented in one direction or may be deposited in a random manner. This web or sheet of fibers is then bonded together with an adhesive of one of several types or by the inclusion of certain thermoplastic synthetic fibers.

OXYCELLULOSE
Cellulose changed chemically by the action of oxidizing agents. This may occur during bleaching resulting in a weakening or tendering of the cotton.

PERCALE BED SHEETING
A bed sheeting made in two types, carded yarns and combed yarns. Combed cotton percale sheetings, the finer of the two types, are smooth, luxurious, plain weave fabrics with approximately 200 threads per square inch. Carded cotton percale sheetings average 180 threads per square inch. Finer yarns are used in combed than in carded percales. The combed percales are often referred to as "true" percales, the carded as "utility" percales.

PIECE GOODS
A general term for fabrics woven in lengths to be sold by the yard in stores. Yard Goods.

PILLING
A process of forming small tangles of fibers. These tangles are defects produced when the surface of a material is rubbed either against itself or a foreign substance; the short fibers pull out of the fabric yarns and entangle themselves with the ends of one or more fibers still held in the yarn. The pill is held on the surface and can be removed only by breaking the fibers that hold it. Pilling is most prevalent in loosely twisted fibers. While historically this occurred principally in woolen and worsted materials, especially knit goods, some constructions of synthetic fibers have been particularly troublesome in this respect.

PLAIN WEAVE
The simplest and most important of the three basic weaves, used in approximately 80% of all woven fabrics. Twill weave and satin are the other two basic weaves.

PLY
The number of single yarns twisted together to form ply yarn. Also the number of ply yarns twisted together to form cord.

ROVING
A loose assemblage of fibers drawn or rubbed into a single strand, with very little twist. It is an intermediate state between sliver and yarn.

SATIN
A smooth, generally lustrous fabric with a thick, close texture made of silk, man-made fibers and others, in a satin weave, either in a warp-face or filling-face effect. In the warp effect fabrics, the warp thread dominates the face, and the reverse situation prevails with filling-face. Satin does not refer to fiber content.

SATIN WEAVE
The third basic weave in which the face of the fabric is formed almost completely of warp of filling floats produced in the repeat of the weave. This is achieved by squaring the points of intersections as evenly and widely as possible. The weave produces a fabric with a characteristically smooth surface employing a greater number of yarns in the set of threads that form the face.

SEAM SLIPPAGE
A defect occurring when sewn fabrics pull apart at the seams. This may be due to improper construction or finish, when yarns are not properly bound together. Fabrics made with smooth yarns like silk, filament rayon or nylon are more troubled by seam slippage than those made with rougher yarns. Or seam slippage may be caused by a stitch which didn't have proper "bite" causing the seam to open. When this occurs in knit fabrics it causes a run.

SELVAGE
A narrow woven edge portion of fabric parallel to the warp made with special stronger yarns in a closer construction than the body to prevent ravelling. The selvage is called fast when it is enclosed by all or part of the picks and not fast when the fill threads are cut off at the edge of the fabric after every pick.

SINGLE
According to A.S.T.M., a variety of yarn in which the fibers are twisted in only one direction and forming the simplest strand of fibers suitable for weaving, knitting, etc.

SIZE (SIZING)
A generic term for compounds which, when applied to yarn or fabric, form a more or less continuous solid film around the yarn or individual fibers.

SKEIN
A continuous strand of yarn or cord of any desired length in the form of a collapsible coil.

SOLUTION DYED
A term used for solution dyed man-made fibers. The coloring matter is introduced into the spinning solution before its extrusion through spinnerets and forming into yarn.

SPINNERET
A small plate used in the manufacture of rayon and other man-made fibers. The spinning solution is forced through holes .002" to .005" in diameter. Usually has 40 holes.

SPINNING
A process of making yarn from fiber prepared for this process by one or several steps. Yarn is produced from fiber by a combined drawing out and twisting operation.

TENSILE STRENGTH
Sometimes referred to as breaking strength. The stress required to cause fabric rupture.

TERRY CLOTH
A cotton fabric (some fabrics are made with man-made fiber blends) with loop pile on one or both sides, covering the entire surface or forming patterns. Single or ply cotton yarns are employed.

TEXTILES
Cloth; fabric; especially one that is woven or knitted. Also see LINEN definition.

TEXTURE
A term describing a yarn or textile appearance, number, character, hand, etc. It may relate to the composition, structure or finish of the yarn or fabric.

THERMOPLASTIC
A term applied to substances having the property of softening at higher temperatures. Specifically applied to certain synthetic resins and to all the true synthetic fibers.

TRICOT
The most important warp knit fabric. It is made with two sets of threads. Fine vertical wales on the face and more or less pronounced crosswise ribs on the back are characteristic of the fabric. Tricot made with yarn crossing from a warp is highly run-resistant and is sometimes called "double warp tricot", "two bar tricot", "glove silk", or "charmeuse". The fabric made with one set of yarn is sometimes called "single bar tricot" or "single warp tricot". When a plain knit is employed, the fabric is called "jersey cloth", generally made with a synthetic fiber.

TWILL
The second of the three basic weaves. Characterized by a diagonal rib or twill line generally running upward from left to right. Each end floats over or under at least two consecutive picks, and the points of intersections move one outward and one upward to produce the diagonal.

TWIST
The number of turns per unit of length about the axis of fiber, roving, yarns, cord, etc. This is generally indicated as turns per inch or T.P.I.

VAT DYES
An important commercial class of dyestuffs marked by a high degree of fastness, especially to light and washing.

VEGETABLE FIBER
Fibers of vegetable origin, e.g., seed hairs; cotton, kapok; bast or soft fibers: flax, hemp; hard fibers derived from the leaf or stem, such as abaca and sisal. They are composed chiefly of cellulose.

WALE
In woven fabric, one of a series of ribs, cords or raised portions. In knitted fabrics, a series of loops in successive courses lying length-wise in the fabric, formed by the action of one needle.

WARP
The set of yarns found in every fabric woven on the loom and running lengthwise parallel to the selvage and interwoven with the filling.

WASHABLE
Term applied to garments or fabric which may be washed without damage to color or shrinkage. Generally considered to need qualification on basis of laboratory tests as to temperature and type of washing the material will stand: hand, home machine, commercial laundering, etc.

WOVEN FABRIC
A woven fabric is one composed of two basic series of yarn, warp and filling. Weaving is the interlacing of these yarns to form a fabric. The specific manner in which the two sets of yarns are interlaced determines the weave. There may be two or more warps and fillings in a fabric. There are three basic weaves: plain, twill and satin.

The following information was provided by T.R.S.A. and provides useful information:

A PRODUCT SPECIFICATIONS DEVELOPMENT AND MAINTENANCE PHILOSOPHY

Product specifications are essential to the achievement of short and long range sales and profit goals in the textile rental industry, just as they are in any other. They serve many useful purposes. For example, they:

- Reflect customers' needs based on the end use of product(s)
- Serve as criteria for assuring proper processing in plant(s), considering existing and potential in-plant processing methods and costs
- Provide a basis for inspection by the receiving department to ascertain that the company is getting what it paid for.
- Reflect direct and indirect supplier manufacturing and finishing processes and their capabilities, limitations and costs
- Mirror the costs and availability of raw materials and chemical finishes
- Serve as vehicles for ongoing performance evaluation and testing, including product development changes based on changing needs or improved technology.

Many tradeoffs occur among the above mentioned factors and others when setting or altering product specifications. Some of the more important factors that must be considered and balanced against each other to arrive at suitable and realistic standards are:

1. The needs and product application exposure at the customer level.
2. The rates your customers are willing to pay and your ability to collect for legitimate loss and abuse charges.
3. Your in-plant processing methods, capabilities, limitations and costs.
4. Your direct and indirect supplier manufacturing processes
5. Availability and cost of components and finished used to make this product.
6. Use of mill and converter level test methods and equipment to reflect actual product performance versus actual in-plant and/or end-use tests.

7. State-of-the-art technology relative to the industry and its suppliers' ability to change or improve standards.

Overriding all of these factors is the impact on your top and bottom lines and those of your suppliers over the long run.

AN APPROACH TO SETTING AND INTERPRETING PRODUCT SPECIFICATIONS

There are many variables to consider in fabric and finished goods construction to achieve given specifications. These specifications can relate to a wide variety of required performance characteristics. Some of them are:

- Hand or feel,
- Absorbency,
- Durability,
- Comfort,
- Fit,
- Shrinkage,
- Protection against burns, sparks, static, charges, hazardous liquid chemicals, and dry particles,
- Possibility,
- Appearance (visual and finished quality), and
- Suability.

A specification by itself should not always be interpreted as reflecting the end-use performance desired. For example, a heavy-weight fabric does not in or of itself imply durability in terms of tensile, tear, or abrasion strength. A lighter fabric made with blended or all-synthetic yarns, lighter but plied yarns; yarns with higher twist multiples, higher thread counts and different weaves can impart more durability in a lighter fabric. Different types of sewing threads can improve seam strength for a given stitch, while stitches can be altered using the same sewing thread to achieve the same or a better result.

The desired hand or feel of a fabric can be furnished by varying the weaves, types of yarns (that is, textured synthetic, blended, spun singles, combed, carded, napped, etc), and finishes.

Dimensional stability is another important characteristic required to laundered products which can be attained in a variety of ways. For instance, sanforizing and compressed shrinkage and proper heat-setting control processes at the mill or finisher level can limit shrinkage. Use of a different fiber, weave, or blend can accomplish the same result. Shrinkage performance estimates and tolerance should be obtained from the supplier when important tot the customer and the plant. Without this the supplier accountability, laundered sizes that truly relate to the market need will frequently vary and the new goods cut and finished size specifications will remain meaningless.

Another illustration shows how to achieve comfort. Use of natural fibers (that is, cotton and rayon) should be considered for absorbency along with synthetic fibers and water-loving, soil release finishes. Although some significant technological improvements have been made to make synthetic fibers with soil release finished more acceptable from an absorbency and cleanability standpoint, they still have some limits.

As a result of this state of the art, customer and in-plant needs should still be taken into account when requesting your product fiber specifications and blend limits. Finally, comfort in terms of breathability may be enhanced by using looser weaves and using wearing-apparel patterns which avoid an overly snug fit.

Trade-offs based on priorities among the specifications themselves will have to be determined. For example, you can request a specification or specifications to assure durability and at the same time lose ground in terms of absorbency. In addition, occasions can arise when a product is too costly due to being over designed in terms of durability or appearance quality. This can occur when the item is subjected to extraordinary abuse, unremovable soil, or uncontrollable loss, and a long product life cycles or high appearance quality level is not appropriate.

Suffice it to say that if you work together as an industry to meet the customer and plant level performance needs and yet remain cognizant of your direct and indirect supplier needs, capabilities and limitations you will achieve a balance in product specifications that will enable all to prosper together over the long run.

GRADES OF MERCHANDISE

Flaws are defined as a crooked hem, a pulled thread, slight size variation, or slight weight variation. Flaws in sheets or pillowcases are normally small weaving defects that do not affect or limit the wearability or general appearance of the item.

Since there are various quality levels of finished flat goods based upon the number and type of flaws, you should work with your supplier to define the various quality levels you need that area available. The type and amount of flaws you may expect with each quality level should be decided upon between you and your supplier.

Goods are graded first quality, second quality, number two (#2) second quality, run-of-the-loom (ROL), and run-of-the-mill (ROM).

` **First quality** - The highest grade of cloth. First quality goods do contain flaws, but the type and quantity of flaws do not exceed that stated in an appropriate specification or standard, or do not exceed that level as agreed upon between buyer and seller for first quality goods.

` **Second quality** - Flat goods containing flaws made in manufacturing or finishing. These flaws do not impair serviceability but do affect the general appearance of the goods.

` **#2 second quality** - Cloth (pound goods) containing flaws (holes) which impair serviceability or contain visible (objectionable) flaws, such as grease spots, dirt and/or dye spots.

` **Run-of-the-loom (ROL)** - Flat goods ready for shipment as it comes from the loom. No weaving defects are eliminated. It is normally a combination of first quality and second quality goods.

` **Run-of-the-mill (ROM)** - Finished flat goods from which an inferior product has not been removed nor has it been graded. Consequently, goods are not up to a standard of quality. This cloth is normally a combination of first quality, second quality and #2 second quality.

COLORED MERCHANDISE

Care should be exercised in the purchase of colored merchandise. The same color purchased from different mills might product different shades of color when faded. Different chemical formulations are used by each mill, causing this effect.

Dyed lots from mills change from day to day and lot to lot. Also, the shades of colors produced are changed.

New government regulations are causing dye chemicals to change rapidly.

Color control parameters should be established by the purchaser showing the limits acceptable from the lightest to darkest shade in a specifically ordered color.

Samples of colored merchandise indicating the parameters of the color tolerance should be accrued to compare against new merchandise. Samples should be changed annually.

When purchasing a specific color from a supplier, specify one mill source. This reduces color differentials appreciably. If you change sources of supply, obtain a sample of the colored merchandise you require. Launder it at least five times to determine the color change or shading. Purchase from the new source if the sample shades the same as the merchandise you have been buying.

AVAILABLE TOWELINGS

The following are definition of available toweling:

` **Birdseye towel** - A cloth made by floating filling yarns over warp threads in a set formation which pro-center dot which resembles a bird's eye. The filling yarns are heavier and loosely twisted to give the cloth additional absorbency. It is normally sold in 14-inch or 15-inch widths and 28-inch or 30-inch double widths. It can be cut to any length.

` **Crash towel** - A broad class of rough textured fabrics made with coarse, uneven yarns; the weave is usually plain, although twill and granite weave is usually plain, although twill and granite weaves are also used. It is normally sold in 16-inch or 18-inch widths and can by cut to any length. Cabinet toweling is normally is normally 10-inch to 11 1/2-inch widths with reinforced selvage for added strength.

` **Glass towel** - A plain weave fabric made of smooth, hard-twisted yarns to prevent linting (shedding of loose fibers). Generally made in stripes or checks, and also prints. It is normally sold in 15-inch or 16-inch widths and can be cut to any length.

` **Herringbone towel** - A broken twill weave composed of vertical sections that are alternately right-hand and left-hand in direction, resembling the vertical structure of the herring. The twill stitches or cuts perfectly where the weave breaks or changes direction, and balances exactly. It is normally sold in 14-inch or 15-inch single widths and 28-inch or 30-inch double widths and can be cut to any length.

` **Huck towel** - A toweling fabric woven with a hucksback weave on a dobby loom in a honeycomb effect. The filling yarns are slackly twisted to aid absorption. It is normally sold in 15-inch, 16-inch, 17-inch and 18- inch widths. It can be cut to any length except it woven with an end border. Cabinet toweling is normally 10-inch to 11 1/2-inch widths with reinforced selvages for added strength.

` **Osnaberg (Osnaburg) towel** - A coarse, strong, plain, weave cotton fabric, sold in the greige or printed with stripes, checks, and novelty effects. A medium-to-heavy weight fabric, it is of a lower count and of coarser yarn than sheeting and may be classified as "coarse sheeting". "Clean" canabergs are made of low-grade, all white cotton; "part waste" or "P.W.P canaberge contain cotton waste. It is normally sold as either greige or bleached goods in either 18-inch or 36-inch widths. It can be cut to any length.

` **Twill towel** - This cloth is characterized by a diagonal rib, or twill line, generally running upward from left to right. Each end floats over or under at least two consecutive picks, and the points of intersection move one outward and one upward (or downward) on succeeding picks, to produce the diagonal line. The smallest twill repeats on three threads and is known as the two up and one down (2/1). In a regular twill, the diagonal line appears in a regular repeat. Normally sold in 15-inch or 16-inch widths, it can be cut to any length.

SPECIFICATIONS FOR BATH TOWELS AND THE GENERAL TERRY TOWEL GROUP

The primary function of a terry towel is to absorb moisture. It must, however, be strong enough to withstand the strain of rubbing and pulling, twisting and tugging of the user, and numerous launderings. A terry towel for the textile rental industry should be constructed of an uncut pile with a sound underweave or ground fabric. The underweave, which supplies the strength of the towel, should be firm, close and tightly woven. The life and strength of any terry towel depends directly upon the strength of the underweave. The loops of the towel which absorb the moisture should be closely packed in a well constructed towel, as the moisture absorbed remains in the surface loops and does not reach the underweave.

Terry towels can be full terry, terry with a border, or ribbed terry. If a border is used, it should be at least two inches from each end as this prevents wrinkling and curling of the towel end.

The 100 percent cotton terry towels have cotton yarns in the warp and till of this underweave and, also the loops. Blended terry towels are normally made with 50 percent polyester/50 percent cotton yarns in the warp of the underweave only. The underweave filling yarns and the loop yarns are then 100 percent cotton, which gives an overall content of 86 percent cotton/14 percent polyester. This is the one of the normal blend levels of polyester/cotton in terry towels, but it is not the rule. Terry towels are cold by size and weight. The weight is always quoted in pounds per dozen at a standard atmospheric condition of 70 degrees Fahrenheit, 65 percent relative humidity.

When you buy terry towels, you are basically paying "x" dollars per pound of fiber. Therefore, one of the factors used in purchasing should be to figure the cost per pound of the terry towel.

Terry towels are always sold in regular or unshrunk sizes. You can expect shrinkage of 10-12 percent in the length and five to eight percent in the width after several launderings.

Textile manufacturers cannot control toweling to exact sizes and weights. Variance in sizes and weights from the above specifications should be under five percent.

Table 1 rates terry towels by their size and weight per dozen. These ratings are determined by consensus agreement.

TERRY TOWELS

BATH TOWELS

Size (Finished)	20 x 40 (LB/DZ)	20 x 44 (LB/DZ)	22 x 44 (LB/DZ)	22 x 48 (LB/DZ)	24 x 48 (LB/DZ)
Extra light	4.00	---	5.50	---	---
Light	4.50	5.25	6.00	---	---
Medium	5.15	5.70	6.25	---	---
Heavy	5.50	6.00	6.75	7.35	8.00

SMALL TERRY TOWELS

Size (Finished)	15 x 25 (LB/DZ)	16 x 26 (LB/DZ)	16 x 27 (LB/DZ)	17 x 36 (LB/DZ)	24 x 48 (LB/DZ)
Extra light	---	---	---	---	---
Light	4.50	5.25	6.00	---	---
Medium	5.15	5.70	6.25	---	---
Heavy	5.50	6.00	6.75	7.35	8.00

BATH MATS

Size (Finished)	18 x 24 (LB/DZ)	20 x 30 (LB/DZ)
Extra light	---	---
Light	---	---
Medium	5.00	7.00
Heavy	---	7.50

WASHCLOTHS

Size (Finished)	11 x 11 (LB/DZ)	12 x 12 (LB/DZ)
Extra light	0.42	0.45
Light	---	0.58
Medium	---	0.75
Heavy	---	1.00

SPECIFICATIONS FOR SHEETS

Sheets manufactured and sold to the institutional market are produced from 50 percent polyester/50 percent cotton fabric and 65 percent polyester/35 percent cotton fabric. Some 100 percent cotton sheets are still available based upon a special order request.

Generally, sheeting fabric is available as either muslin or percale. Muslin is a bed sheeting made of plain weave carded cotton in several different constructions; 56 by 56, 64 by 64, and 72 by 68 are generally employed. The fabric is usually bleached and finished with very little sizing. It is firmly made with strong tape selvage.

Percale is a bed sheeting made in two types: of carded yarns and of combed yarns. Combed cotton percale sheetings, the finer of the two types, are smooth, luxurious, plain weave fabrics with about 200 threads per square inch. Carded cotton percale sheetings average 180 threads per square inch; the yarn is finer than that used in muslin sheeting. The finer sheetings of combed yarns are often called true percale; the carded percales often are called utility percale sheeting.

Blended sheets in the greige are sold in the following finished counts.

` **Muslin carded, Type 130** - a total of 130 threads per square inch (total fill and warp yarns) weighing a minimum of 3.5 ounces per square yard.

` **Percale combed, Type 180** - a total of 180 threads per square inch (total fill and warp yarns) weighing a minimum of 3.5 ounces per square yard.

The above sheets are also available with a two-inch by two-inch hem or a three-inch by one-inch hem. This changes the manufacturer cut size or manufactured finished size accordingly.

The Type 130 count is approximately five percent heavier by weight than Type 180 higher count.

Shrinkage can occur in both directions; ironing reduces it in one direction or the other.

Property marking or size identification can be accomplished by the use of colored selvage edges, dye transfers, continuous name printing, or labels. This marking or identification is available from suppliers upon request by the purchaser at an additional charge.

Hospital and nursing home draw sheets are not included. Standards for these sheets will be included in the general category of hospital items.

SPECIFICATIONS FOR TABLECLOTHS

Tablecloths sold to the industry are primarily made from 100 percent cotton momie cloth. Tablecloths made from 50 percent polyester/50 percent cotton, 65 percent polyester/35 percent cotton, and 100 percent polyester are available. Normal weights of greige momie cloth material range from 5 1/2 ounces per square yard to 6 3/4 ounces per square yard. Momie cloth is a broad classification of weaves producing a small, irregular, pebbled character similar to crepe.

Momie cloth is woven 42 inches to 90 inches in pre-laundered, finished widths. Tablecloths are made in the following pre-laundered widths: 36 inch, 45 inch, 54 inch, 63 inch, 72 inch, 81 inch, and 90 inch.

In addition, woven damask is available in 100 percent cotton as well as in various other blend level combinations.

In purchasing tablecloths, it is important to remember that the first number is the width and the second number is the length.

Pre-laundered square tablecloths should be cut one inch longer than the width for sizes up to and including 72 inches. Above 72-inch widths, tablecloths should be cut two inches longer than the width. Textile rental operators feel that tablecloths should be hemmed with a half-inch hem instead of a quarter-inch hem.

A 54-inch tablecloth is normally cut 55 inches long before laundering. A quarter-inch hem makes the table-cloth finish 54 inches by 54 inches. By providing a half inch hem, the table cloth will finish 54 inches by 53 inches before laundering. This slight change is not noticeable. It provides better finished appearance to the tablecloth.

Momie cloth is available in all widths (36 inch through 90 inch), with a one-side print. These cloths are available without splicing. Momie cloth is also available in many colors (see colored merchandise).

It is suggested that tablecloths have labels or identifying marks in two diagonal corners to identify the size and color.

Tablecloths should be hemmed with a polycore thread using eight stitches to the inch. Correct tolerances (variances) would allow seven to nine stitches per inch.

SPECIFICATIONS FOR NAPKINS

Napkins are available in momie cloth made from the same fabric as table cloths. As greige goods, the weight is 5 1/2 to 6 3/4 ounces per square yard. Napkins are cut in width and length. They should be finished on all four sides with one-quarter inch hems. This reduces the pre-laundered cut size by one inch. Example: 21 inch by 21 inch cut size finished to 20 inch by 20 inch napkins.

Other types of available momie napkins include 50 percent polyester/50 percent cotton, 65 percent polyester/35 percent cotton, and 100 percent polyester. In addition, woven damask is available in 100 percent cotton and various blend level combinations.

Colored napkins are also available. They are made from a sheeting with a discernable warp-rib in the goods to form a border. In greige goods, the weight is 2.65 yards per pound. Corded napkins are finished with either two-side, quarter inch hems; three- side, quarter inch hems, or four-side, quarter inch hems. Three-side and four-side napkins should be back tacked and have mitered corners.

Napkins should be hemmed with a polycor thread using eight stitches to the inch. Correct tolerances (variances) would allow seven to nine stitches per inch.

The color ranges of napkins should be the same as tablecloths and subject to the same color control parameters.

SPECIFICATIONS FOR PILLOW CASES

Pillow cases are made from the same material as sheets. Some 100 percent cotton pillow cases are still available based upon special order request.

In purchasing pre-laundered cut size pillow cases, it is important to remember that the first number is the width and the second number is the length. The width is labeled as twice the actual finished width to account for the double layer. Example: 42 inch by 34 inch cut size finishes to 21 inch by 33 inch with a one inch hem.

Blended pillow cases in the greige are sold in the following finished counts:

` **Muslin corded, Type 130** - a total of 130 threads per square inch (total fill and warp yarns) weighing a minimum of 3.5 ounces per square yard.

` **Percale combed, Type 180** - a total of 180 threads per square inch (total fill and warp yarns) weighing a minimum of 3.5 ounces per square yard.

The type 130 count is approximately five percent heavier by weight than the Type 180 higher count.

Property marking or size identification can be accomplished by the use of dye transfers, continuous name printing, or labels. This marking or identification is available from suppliers upon request by the purchaser at an additional charge.

GENERAL DATA AND RULES OF THUMB

Cylinder Volume:

$$\frac{\text{Radius in inches} \times \text{Length in inches}}{1728} = \text{cu. ft. cylinder volume}$$

or Area in feet x Height in feet = cu. ft. cylinder volume

Accepted capacity for washer-extractor: 5 to 6 lbs. per cubic ft.

"G" Force: (Estimated)

RPM x RPM x Diameter (in.) divided by 70,500 = "G" Force

Recommended minimum "G" Force for normal washers is 220 G's.

Moisture Retention:

$$\frac{\text{Weight after extraction - dryweight}}{\text{dry weight}} \times 100 = \text{\% moisture retention}$$

Electricity:

Horsepower x .7457 = KWH
Watt/Hours x 3.413 = BTU
One KWH = 3413 BTU

To calculate approximate electrical consumption, use the following formula for each motor in the laundry (then total the results for all motors):

$$\frac{E \times 1.73 \times PF}{1000} \times \text{No. hours operated} = \text{KWH/day}$$

I = amps
E = volts
PF = power factor (as a rule of thumb, assume motors running fairly constant load - such as washer-extractor or dryer motors - at 80%.

Water: (In U.S. Gallons)

1 gallon = 8.33 lbs
1 cubic ft. of water = 7.48 gallons
1 cubic ft. of water = 62.425 lbs.

Fuel:

One gallon No. 2 (Diesel) fuel oil = 138,000 BTU (approx.)
One gallon No. 6 fuel oil = 152,000 BTU (approx.)
One kilowatt (KW) = 3,413 BTU
One gallon propane = 92,000 BTU

Gas cost:

The cost of gas is usually stated in price per therm or price per MCF (1,000 cubic feet). In computing costs, the actual total cost (including taxes, etc.) to the user should be used, and divided by the number therms used to find the cost for one therm. Various rate structures are used by local gas suppliers. They include "straight line rates" and "block rates". In which the rate varies for various quantities. Additional charges such as "demand charge", "commodity charge" or "service charge" may also be part of the gas cost. Any charge the customer must pay to receive gas, including sales tax where applicable, should be included in the total gas cost from which the actual cost per therm is derived.

Boiler Horsepower: (Estimated)

One BHP = The work of converting 34.5 lbs. of water per hour from and at 212^{o} Fahrenheit to steam at 0 lbs. gauge pressure.
One BHP = 33,500 BTU/hr.
One BHP = 34.5 lbs./steam
One BHP = 9.803 kilowatts

Volume: (U.S. Gallons)

1.0 cubic foot = 7.48 gallons
0.134 cubic foot = 1.0 gallon

Cart Capacities Cart Size (Bushel)	In Pounds Dry Soiled	Wet	Folded
1	6.22	12.45	14.94
5	31.12	62.25	74.70
6	37.35	74.70	89.64
8	49.80	99.60	119.52
10	62.25	124.50	149.40
12	74.70	149.40	179.28
14	87.15	174.30	209.16
16	99.60	199.20	239.04
18	112.05	224.10	268.92
20	124.50	249.00	298.80

Gallon x .13368 (or .1337) = cubic foot
Gallon x 231 = cubic inches
Pound of water x .016 = cubic foot
Pound of water x .12 = gallons
About 50% of water used in a laundry is hot (if a conventional water system is used)
Boiling water 212^{o} Fahrenheit (^{o} F) = 100^{o} Centigrade (C^{o})
Freezing water 32^{o} Fahrenheit (^{o} F) = 0^{o} Centigrade (C^{o})
To convert to ^{o}F multiply ^{o}C by 9/5 and add 32
To convert to ^{o}C subtract 32 and multiply ^{o}F by 5/9

Water Hardness

More tallow soap or detergent is needed for washing in hard water than soft water. Water softener may be required if grains of hardness over 3.5 grains/gallon (60 ppm). Soften both hot and cold water.

Water hardness definitions:

Grains/Gal.	Parts/million	Description	Softening
Less than 1.0	Less than 17.1	Soft	Do not Soften
1 to 3.5	17.1 to 60	Slightly hard	Not Required
3.5 to 7.0	60 to 120	Moderately hard	RECOMMENDED
7.0 to 10.5	120 to 180	Hard	REQUIRED
10.5 & over	180 & over	Very Hard	REQUIRED

Water containing as little as 0.2 ppm iron can cause discoloration in Laundry.

Gas:

BTU is the amount of heat required to raise one pound of water one degree Fahrenheit (approx.)

One therm (TH) = 100,000 BTU
One cubic foot = 1,000 BTU (approx.)
One MCF (1,000 cu. ft.) = 10 therms (approx.)
One cubic foot of butane gas = 3,200 BTU

Metric Equivalents:

1 U.S. gallon = 3.785 liters
1 cubic foot = 0.028 cubic meters = 28.317 liters
1 foot = 0.3046 meters
39.37 inches = 3.28 feet = 1.0 meter
1 pound = 0.4536 kilograms

I. DETERGENTS

The detergent should always include a nonionic surfactant either alone or in combination with an anionic surfactant to ensure cleaning of polyester fiber. Use sufficient detergent for good soil suspension.

For more extensive information on washroom chemistry and chemicals, refer to Textile Laundering Technology by Charles L. Riggs, PH.D. and Joseph C. Sherrill, PH.D. This book was formerly available through the Textile Rental Services Association of America.

A. Nonionic Detergents

At present the most efficient laundry detergents marketed for the laundering of a wide variety of fabrics under varying conditions of soil and water hardness are based upon "nonionic" ingredients (or "nonionic" ingredients coupled with anionic ingredients).

The basic chemicals from which nonionic detergents are produced are derived from petroleum or plant oils. These are than reacted with ethylene oxide to give them varying degrees of water solubility. Nonionic detergents can be tailor-made to give optimum performance characteristics at different washing temperatures and with different types of soils.

The term "cloud point" is usually associated with nonionic detergents. It is a measure of a nonionic detergent's solubility in water. A nonionic detergent is said to perform best, just at, or slightly below its cloud point. To illustrate - a nonionic detergent with a cloud point of 140^{o} Fahrenheit, will perform admirably at 140^{o} Fahrenheit.

If the wash temperature is increased appreciably above 140^{o} Fahrenheit, say to 170^{o} Fahrenheit, then the performance characteristic of this particular nonionic may be found to decrease dramatically at the higher temperature. When the cloud point of a nonionic detergent is greatly exceeded, its sudsing characteristic will likewise be decreased or depressed.

Nonionic detergents are marketed as both powders and liquids containing alkaline builders, water conditioners, soil suspenders and fabric whiteners. For specialized application they also may contain a solvent base.

Nonionic detergents, more than any other type of laundry detergents, have been shown to possess excellent grease-cutting power. For this reason, their efficiency on loosening oily, greasy soils from polyester and PEC blends, as well as cotton fabrics, accounts for the continued success of nonionic based laundry detergents.

B. Other Detergent Additives

There are other detergent additives, which when added to some alkaline builders, built soaps or built detergents, which enhance the performance characteristics of these formulations. The most important of these chemicals is called sodium carboxymethyicellulose. This is often abbreviated as CMC. Small percentages of CMC, for example, in the 1-3% range by weight contribute substantially to a product's soil suspending properties.

Laundry detergents, in contrast to laundry soaps, owe their increasing popularity to: (A) high tolerance for hard water, and (B) their effectiveness in removing soils from polyester and PEC blends as well as cottons under conditions of both hard and soft water.

Before discussing laundry detergents and their use by the health care laundry industry, it is necessary to explain a simple chemical concept. When many water soluble substances dissolve in water, they dissociate into particles called "ions". Some of these particles carry a positive electrical charge and are called "cations"; some carry a negative electrical charge and are called "anions". This is the case with detergents. Detergents, in which the negatively charged particle (anion) does the work of loosening and suspending the soil, are called anionic detergents. Those in which the positively charged particle (cation) does the work are called cationic detergents. A detergent which when mixed with water does not dissociate into "ions" is called a nonionic detergent. As will be discussed shortly, the nonionic detergents, either alone or in combination with anionic detergents, have been demonstrated to be superior in laundering polyester and PEC blends under varying conditions of soil and water hardness.

C. Ionic Detergents

The first type of laundry detergents (sometimes referred to as synthetic detergents) to gain any measure of success was of the anionic type. These detergents were synthesized by industry to give properties very similar to laundry soaps but with a high tolerance for hard water.

Anionic detergents are rarely marketed in their neutral form to the laundry industry, but rather they are combined with alkaline builders, water conditioners, soil suspenders, and fabric whiteners in both the dry and liquid forms. They are excellent for washing cottons under both soft and hard water conditions. In addition, they are generally more efficient than laundry soaps on polyesters and PEC blends. As a class, anionic detergents are generally high sudsing in materials.

D. Cationic Detergents

Although cationic detergents are readily available in the market place, they find use primarily in textile processing and in the dry cleaning industry. To date, these detergents have not found any degree of acceptance by laundries.

II. BLEACH

A. Types of Bleach Used in Textile Processing

Bleaches are either oxidizing or reducing in their action on stains. An oxidizing bleach can cause a loss of electrons while a reducing bleach may add electrons. Examples of oxidizing bleaches are: chlorine bleach, hydrogen peroxide, sodium perborate, sodium peroxide and potassium permanganate. Examples of reducing bleaches are: sodium hydrosulfite, sodium bisulfite, titanous chloride, and oxalic acid.

In normal laundry baths oxidizing bleaches are most widely used. Of the reducing bleaches oxylic acid (very strong and dangerous) is used for very specialized stain treatment. We have limited our comments to the most common bleach used in laundering -- chlorine bleach.

B. Function of Bleaches

Bleaches have two primary functions which can be relied on in the laundry process. They are to combat stains and microorganisms. As a biproduct, however, bleaches cause a whitening of the textiles. This whitening effect is often erroneously thought to be detergent. Be aware that:

> General soil removal is not significantly increased by bleach. Bleach is ineffective (or even useless) in the removal of inert soils and some fats and oils. Attempting to use bleach to remove soil will much more rapidly deteriorate fabrics than enhance soil removal.

C. Sterilizing with Bleach

Bleach is effective in adding to the sanitization of textiles. It, in combination with the other laundering chemicals, temperature of 140° - 155 °F, mechanical action, water dilution and time, play an important role in providing sanitary textiles to our guests.

Poor wash formulas; washing temperatures which do not optimize chemical action and incomplete rinsing will result in a dingy textile, potentially increase fabric deterioration, and could be less sanitary than desired.

D. Recommended Procedure for Using Liquid Chlorine Bleach

Liquid chlorine bleach should only be used on stains and fabrics where the bleach will be safe and effective. All fabrics should be tested for bleach before processing with chlorine bleach.

Bleach should be added through the dilution of an automatic supply system, if possible. If it must be added by hand through the supply door, care should be taken to add bleach slowly and (if applicable) only on the cycle where the washer cylinder is rotating downward into the water.

E. Bleach Quantity and Concentration

Normally recommended is one quart of a bleach solution assaying 1% available chlorine per 100 lbs. of textiles. For stain removal with chlorine bleach, two quarts of 1% bleach can be used.

F. Time and Temperature

A bleaching temperature of 140 ° to 155 ° F. is most effective. It is extremely important that bleaching take place only within this temperature range. The chemical action of bleach is reduced by decreased temperatures and increased by higher temperatures.

Too slow bleach action will lead to a chlorine carry-over in the fabric that can cause immediate and irreversible tensile strength loss when the fabric is subjected to heat. Too high a bleaching temperature causes dramatic losses in tensile strength above temperatures of 160 °F.

Pin holes in textiles and isolated spots of damage on fabrics are common symptoms of errant temperatures in bleaching (too high or low). It is extremely important that bleaching take place only within this temperature range.

Normal practice uses a bleach bath of 6 - 8 minutes for normal wash loads and up to 10 - 12 minutes for specialized stain treatment.

G. Alkalinity of Bleach Bath

The bleach bath should have a pH (alkalinity) of between 10.2 and 10.8. There is a practice within the industry where chemical suppliers only provide the titration readings of the bleach bath. It is essential that they also provide to the laundry manager the actual pH.

While titration is a valid indicator if the composition of the alkali is known, it can be misleading if different alkalis are used. As a part of the chemical analysis performed by your supplier, you should insist on receiving the pH level of all operations within your wash formula.

H. Antichlors

Reducing bleaches such as sodium sulfite, sodium thiosulfate, sodium hydrosulfite, or sodium bisulfite "strip" the last traces of chlorine bleach during rinsing. They are commonly used on polyester-cotton textiles because some of the synthetic fabrics may carry chlorine retaining finishes. The normal use rate is one half to two ounces of product per 100 lbs. textiles. The antichlor is normally applied at some point after the first hot rinse.

I. Bleach Summary

All chlorine bleaching depends upon time, temperature, quantity and concentration to react properly in the wash cycle. We recommend:

Time	6 - 8 minutes
Temperature	140 - 155 °F.
Quantity	1 quart per 100 lbs. textiles
Concentration	1% available chlorine
pH	10.2 - 10.8.
Antichlor	½ oz - 2 oz. per 100 lbs.

III. SOURING

The purpose of a sour is to neutralize and eliminate alkaline residues from the wash which may be in the fabric. Alkaline residues may cause yellowing and discoloration of the wash load in drying and in storage. Silicoflourides are commonly used as laundry sours. Sodium bisulfite when used as an antichlor may be sufficient as a sour. Whether a sour is required depends upon the state of the fabric at the end of the wash cycle. A fabric pH determination is a most effective guide. If the fabric is alkaline, use a sour to provide a neutral fabric for drying and ironing.

IV. FABRIC SOFTENING

Fabric softeners have several purposes: they provide a smooth, supple fabric; they improve handling of the wash load, especially in ironing; they may reduce or eliminate static buildup and discharge in hot, dried fabric. Fabric softeners are generally applied as part of the last operation in the washer, but more recently softeners which may be included in the suds operation have appeared. Softeners have properties beneficial in laundering but they may cause or contribute to soiling, soil redeposition and chlorine retention under some circumstances. Most laundry softeners are fat or oil based amide or amines which are attracted to and held on the cotton fibers of the sheet. They are very efficient because they tend toward uniform distribution in and on the fabric. Very little softener is required to achieve large softening effects. It might be noted that the softening effect comes from the fatty or oily nature of the softener; the antistatic effect comes from the amide part of the softener. Since the softener is oily it will attract and hold soils. If not removed in subsequent laundering buildup of softener and soils will occur leading to greying dinginess. The amide or amine part of the softener can react with chlorine to form chloramides of chloramines. Usually these are destroyed with an antichlor, but if still present on the fabric during drying and ironing chlorine is released and may cause fabric damage and discoloration.

Residual softeners are usually removed in laundering under normal laundering conditions. Detergent concentration should be high enough to prevent redeposition.

V. BLUING AND BRIGHTENING AGENTS

By definition, tints such as bluing and florescent whitening agents are dyes. When applied in laundering the intent and effect is to overdye the fabric in the wash load. Overdyeing obviously changes the color of the wash load. When used judiciously on whites, the appearance of the white fabric is improved. When overdone, whites may become dull and grey from the bluing or dull and yellow from excess fluorescent whitening agent. The effect may be progressive from repeated applications.

If applied to dyed fabrics, especially on pastel shades, fluorescent whitening agents may overdye the fabric sufficiently to completely alter the shade of the fabric and even hide the original dye to such an extent that the fabric appears to have lost most of its color.

The effect is progressive. Repeated applications of fluorescent whitening agents lead to apparent color loss in pastels and dulling and alteration of shade in heavier colors.

Fluorescent whitening agents are sometimes referred to as colorless dyes. In fact, many are dull yellow in the absence of ultraviolet light which causes fluorescence. Under most room lights, for instance, when the amount of fluorescent whitening agent in a fabric increases above the threshold amount, fluorescence is quenched and the fabric becomes very dull and yellow. Such an amount in fabric can be achieved by repeated applications and buildup of fluorescent whitening agent during laundering. Some fabrics yellowed by excessive fluorescent whitening agent may be recovered by simply laundering without fluorescent whitening agent. Some may not because of the permanence of the dyeing with fluorescent whitening agent.