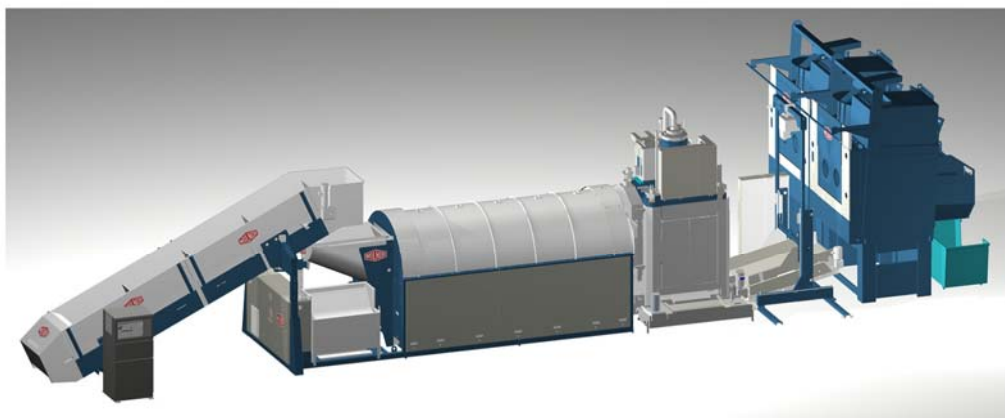




SIZING AND PLANNING A LAUNDRY



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SIZING AND PLANNING A LAUNDRY

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BASIC INFORMATION

NOMENCLATURE

42044 Washer Extractor

First 2 digits (42) = Cylinder Diameter (inches)

Last 2 digits (44) = Cylinder Depth (inches)

Note: Other American Manufacturers use the same format

CYLINDER VOLUME

Formula: CDI = Cylinder Diameter in inches
Cd = Cylinder depth in inches

$$\frac{CDI * CDI * cd}{2,200} = CYLINDER VOLUME (ft^3)$$

$$\frac{42" Diameter * 42" Diameter * 44" Depth}{2,200} = 35.28 ft^3$$

LOAD FACTOR

Formula: CWGW = Clean Weight of Goods in Washer (lbs)
CV = Cylinder Volume (ft³)

$$\frac{CWGW}{CV} = Load Factor$$

Example: 42044WP2 Washer Extractor Load Size = 200 lbs
42044WP2 Washer Extractor Cylinder Volume = 35.28 ft³.

$$\frac{200 Pound Load}{35.28 Cu Ft} = 5.66 Pounds per Ft^3.$$

Note: 1. A generally accepted load factor (lbs of Linen/ft³ of Cylinder Volume) is between 5.50 to 6.50 lbs.

2. High bulk goods, like the new micro denier fabric for surgical items, require the machine to be under loaded to 65% of its capacity.
3. Dense goods, like walk-on-mats permit the overloading of the machine by 30%.

"G" FORCES

DEFINITION: A Measure of Extraction's Efficiency to Remove Water.

Formula: CRPM=Cylinder Revolutions per minute
 CD = Cylinder Diameter (Expressed in inches)

$$\frac{CRPM * CRPM * CD}{70,500} = "G" FORCES$$

Example: 42044 WP2 with 700 RPM Final Extract Speed
 42" Cylinder Diameter

$$\frac{700 RPM * 700 RPM * 42" Diameter}{70,500} = 292 "G" s"$$

- Note:
1. The higher the "G" force, the greater the centrifugal force exerted on the goods.
 2. One "G" equals 1 times the force of gravity.
 3. Other factors which may affect Extraction are:

- **Final bath temperature
- **Final bath chemicals
- **Length of extraction time
- **Type of goods (towels/sheets)
- **Ambient air humidity
- **% of cylinder open area to close area
- **Size of basket perforations
- **Type of material (cotton, 50/50)
- **Thickness of the load
- **Altitude of installation

WATER

MOISTURE

RETENTION: The amount of water contained in the linens after the final extraction. Expressed as a % of the dry weight of the goods being washed.

NOTE: The DIN (German Industrial Norm, the equivalent of our American Standard Association) method adds 5% to the weight of dry textiles to account for the ambient humidity. This method assumes that goods that have been dried will, when allowed to sit on a shelf, absorb 5% of their bone dry weight.

MOISTURE
RETENTION:

Formula: American Norm (Bone dry method)
WGAX = Weight of Goods after extraction
DWG: Dry weight of goods

$$\frac{((WGAX - DWG) * 100)}{DWG} = \% \text{ Moisture retention}$$

Example: 42044 WP2 Washer Extractor
310 lbs = Weight of goods after extraction
200 lbs = dry weight of goods

$$\frac{((310 - 200) * 100)}{200} = 55\% \text{ Moisture retention}$$

Formula: European Norm (DIN Method)

WGAX = Weight of goods after extraction
DWG5 = Dry weight of goods plus 5% of its weight

$$\frac{((WGAX - DWG5) * 100)}{DWG5} = \% \text{ Moisture retention}$$

Example: 42044 WP2 Washer Extractor
310 lbs = Weight of goods after extraction
10 lbs = 5% of 200 lbs of Dry Weight

$$\frac{((310 - (200 + 10)) * 100)}{(200 + 10)} = 47.62\% \text{ Moisture retention}$$

200 lbs = Dry weight of goods

WATER
PRESSURE:

The recommended water pressure is a range of 40 psi to 60 psi. Below 40, the washer extractor has to wait too long to fill. Above 60, there is the possibility of water hammer.

Air operated water valves, on MILNOR large (standard) and small (optional) machines, have a closing adjustment which helps to minimize the water hammer problem.

**ESTIMATED
PEAK WATER
FLOW RATES:**

In multiple machine installation, the maximum flow rate will occur when all inlet valves open simultaneously. But using this criteria would result in over design and costly installation. Therefore, we use the following rule of thumb:

1. The flow rate required by the largest machine in the installation, OR
2. The flow rate equivalent to one third of all machines filling simultaneously.

We recommend the use of whichever results in the largest flow rate of the two options. The ideal flow rate will allow a machine to reach rinse level, which is usually the highest level, in approximately 60 seconds. Filling in less than 60 seconds may result in water hammer, particularly in the long runs of pipe.

EXAMPLE:

A laundry with 4 washer extractors, each requiring 40 gallons for the rinse level. The total number of gallons if all machines filled simultaneously would be:

$$40 \text{ gallons} \times 4 \text{ machines} = 160 \text{ gallons}$$

Applying rule #1: 40 gallons = flow of largest machine

Applying rule #2 160 gallons \div 3=53 gallons

Therefore, we would choose 53 gallons since it is the larger of the two values (40 gallons and 53 gallons).

**PROPER
PIPE SIZE:**

For multiple washer extractor installations, each water line should be sized according to the following rules:

1. A size larger than the largest water inlet valve in the installation, OR
2. A size larger than the one third of the total area of all the water valves connected to the line.

We recommend the use of whichever results in the largest flow rate.

**CONVERSION
FACTORS:**

1 gallon of water = 8.33 lbs in weight

1 cubic foot of water = 7.48 gallons

1 cubic foot of water = 62.425 lbs in weight

WATER HARDNESS

HOW IT'S

MEASURED: Grains of hardness OR parts per million

Degree Hardness	Grains per US Gallon	Parts per Million
Soft	Less than 1.00	Less than 17.1
Slightly hard	1.0 to 3.5	17.1 to 60
Moderately hard	3.5 to 7.0	60 to 120
Hard	7.0 to 10.5	120 to 180
Very hard	10.5 and over	180 and over

NOTE: What we call hardness is really calcium and magnesium salts in water. These minerals may result in deposit build-up on heat transfer surfaces and pipes thereby reducing efficiency. A softener is recommended when the degree of hardness exceeds 3.00 grains because chemical costs increase disproportionately as the water becomes harder.

SIZING A WATER
SOFTENER:

1. Determine the hardness of the water supply. In most cases the municipal water works will be glad to provide the information. Water softener companies will do free analysis. Call them for a sample bottle.
2. Compute the amount of water required per day, the peak water flow rate (see estimated peak water flow rate") and the grain hardness that must be removed from the calculated amount of water.
3. A softener must be chosen with a capacity (gallons/regeneration) and a peak flow rate equal to or greater than the one required for the laundry. Ideally the regenerating capacity (number of grains of hardness removed in a given period of time) should permit the softener to be regenerated once every day. If the regenerating capacity of the softener is not sufficient and requires more than one regeneration per day, then a dual softener should be used.
4. The salt requirement may be calculated using the formula below.

FORMULA: $THG = \text{Total hardness in grains}$
 $(THG \div 1000) \times 0.50 = \text{lbs of salt}$

SIZING DRAIN

TROUGHS:

1. Determine the maximum amount of water to be dumped at one time. This is usually at the rinse operation which normally is the highest water level.
2. Divide the total number of gallons by 7.48 to obtain the number of ft³ required to hold the given amount of water.
3. Starting with a width of 14" and an initial depth of 12", find the length necessary to obtain the required ft³ to hold the amount of water being dumped.
4. The bottom of the trough should be sloped toward the drain, at 0.25 of an inch per linear foot. If the slope is too steep, the slope can be reduced to no less than 0.12 of an inch per linear foot.
5. The drain trough should be empty by the time the next large amount of water is dumped. The trough's drain must be sized properly to accomplish this.

EXAMPLE:

175 gallons are being dumped at one time.
The width of the drain trough is 1.167 ft (14")
The initial depth of the trough is 1.0 ft (12")
The trough's drain is 4" diameter pipe

$$\frac{175 \text{ Gallons}}{7.48 \text{ Gallons per ft}^3} = 23.40 \text{ ft}^3$$

$$\frac{23.40 \text{ Ft}^3}{1.0 * 1.167} = 20 \text{ ft}^3$$

@0.25" slope, the end of the trough would be 17" deep

@0.12" slope, the end of the trough would be 14.50" deep

FUEL

UNIT OF
MEASUREMENT:

British Thermal Unit (Btu)- Amount of heat required to raise one pound of water one degree Fahrenheit.

NATURAL
GAS:

High heat (US Standard)
1,000 Btu/ft³ (Approx.)

Low Heat (European Standard)
880 Btu/ft³ (Approx.)

Therm=100,000 Btu
MCF=1,000 ft³ =10 Therms (Approx.)

NOTE:

Local natural gas supplier will provide actual Btu content of the natural gas it produces. The Btu content of natural gas will vary over time, even from the same source.

CALCULATING NATURAL GAS REQUIRED TO HEAT WATER:

FORMULA:

HWT = Hot water temperature (degrees Fahrenheit)
IWT = Incoming water temperature (degrees Fahrenheit)

$$\frac{\text{Gallons per hour} * 8.33 (\text{Lbs per Gallon}) * (\text{HWT} - \text{IWT})}{\text{Water Heater Efficiency Factor (Typically 85\% - 95\%)}} = \text{Btu per Hour (input)}$$

EXAMPLE:

1,800 gallons of water required per hour
70% of total water required to be heated
Temperature of hot water to be 180° F
Temperature of incoming water is 45° F
Efficiency factor of heating system is 85%

$$\frac{(1,800 * 70) * 8.33 * (180 - 45)}{85\%} = 1,666,980 \text{ Btu per Hour (input)}$$

Find number of Btu/Hour (input) required to heat water?

FUEL

Find number of Btu/Hour (input) required to heat water?

$$\frac{1,666,980 \text{ Btu per Hour}}{100,000 \text{ Btu per Therm}} = 16.67 \text{ Therms of Gas}$$

SIZING A GAS WATER HEATER:

1. Match as close as possible the heater's Btu input to the calculated Btu/Hour (input). Otherwise, the heater will not have the capacity to meet the water heating requirements.
2. The storage tank of the heater should have a minimum capacity equal to one half of the hourly requirement. The most desirable situation should be for the storage tank to have 75% capacity of the hourly requirement.

LP Gas: 91,630 Btu per US gallon
21,611 Btu per pound
4.24 lbs per US gallon

Butane: 1 cubic foot=3,200 Btu

No. 2

Diesel Oil: 1 US gallon=138,000 Btu

No. 6

Bunker Oil: 1 US gallon=142,000 Btu

STEAM

BOILER HORSEPOWER (BHP):

Work required to convert 34.50 lbs of water per hour from a liquid at 212° F to steam at 212° F and 0 lbs gauge pressure.

BHP = 33,500 Btu

BHP = 34.50 lbs of steam

1 Pound of steam = 971.01 Btu

STEAM PRESSURE:

Normal laundry steam pressure ranges between 100 to 125 PSI. Higher pressures may cause steam inlet valves to malfunction, because they are trying to open against too high a pressure.

FORMULA:

HWT=Hot Water Temperature (degrees Fahrenheit)
IWT=Incoming Water Temperature (degrees Fahrenheit)

Gallons/Hour x 8.33 (lbs/Gallons) x (HWT-IWT) = Btu/Hour (Output)

EXAMPLE:

1,800 gallon of water required per hour
70% of total water required to be heated
Temperature of hot water to be 180°F
Temperature of incoming water is 45°F

Find number of Btu/Hour required to heat water?

$(1,800 \times .70) \times 8.33 \times (180-45) = 1,416,933$ Btu per hour

Find BHP/Hour required to heat water?

$$\frac{1,416,933 \text{ Btu per hour (Output)}}{33,500 \text{ Btu per BHP}} = 42.29 \text{ BHP}$$

SIZING A
BOILER:

1. Determine the total amount of the static steam requirements per hour. Convert these requirements to boiler HP.
2. Divide required BHP by 70% to get recommended boiler size. This allows excess capacity for plant start-up and plant expansion.
3. Match as close as possible the hourly requirements to the manufacturer's rating of the boiler. Make sure the boiler size exceeds the requirements divided by 70%.

EXAMPLE:

The presses require 950 lbs of steam per hour

$$\frac{950 \text{ Pounds of Steam per Hour}}{34.50 \text{ Pounds of Steam}} = 27.53 \text{ BHP}$$

$$27.53 \text{ BHP} \div 70\% = 39.33 \text{ BHP}$$

A 40 HP boiler would be selected, because that is the closest standard manufactured size available.

ELECTRICITY

FORMULA:

$$\frac{\text{Electric Motor HP} * 0.7457}{\text{Motor Efficiency Factor \%}} = \text{KWH}$$

EXAMPLE: Find the KWH of a 20HP motor with an efficiency factor of 85%.

$$\frac{20.00 \text{ HP} * 0.7457}{85\% \text{ Efficiency Factor}} = 17.55 \text{ KWH}$$

MOTOR FULL LOAD CURRENTS:

3 Phase A.C. Induction Type-Squirrel Cage and Wound Rotor

HP	115V	208V	240V	480V	600V
0.50	4.0	2.2	1.9	1.0	0.8
0.75	5.6	3.1	2.7	1.3	1.1
1	7.2	4.0	3.5	1.7	1.4
1.50	10.4	5.8	5.0	2.5	2.0
2	13.6	7.5	6.5	3.3	2.6
3		10.6	9.2	4.6	3.7
5		16.8	14.6	7.3	5.8
7.50		25.0	21.7	10.8	8.7
10		30.8	26.7	13.3	10.7
15		46.2	40.0	20.0	16.0
20		59.6	51.7	25.8	20.7
25		75.0	65.0	32.5	26.0
30		88.5	76.7	38.4	30.7
40		115.4	100.0	50.0	40.0
50		140.2	121.5	60.8	48.6
60		170.2	147.5	73.8	59.0
75		212.5	184.2	92.1	73.7
100		274.0	237.5	118.7	95.0
125		344.2	298.3	149.2	119.3
150		399.9	346.6	173.3	138.6
200		578.8	501.6	250.8	200.7

- NOTE: 1. Total AMPS for a piece of equipment with several motors equals the sum of AMPS for each motor included in maximum number of motors which can run simultaneously.
2. Correction of AMPS for exact voltage-AMPS at chart voltage to AMPS at another voltage.

ELECTRICITY

FORMULA:

$$\frac{(CHART\ AMPS * CHART\ VOLTAGE)}{New\ Voltage} = New\ Full\ Load\ AMPS$$

EXAMPLE: AMPS for 25 @ 415V

Since we want to know the full load AMPS for a 25 HP motor at 415V, and this is not on the chart. We can pick any voltage (say 240V) for a 25 HP motor and convert the amperage (65 AMPS in this case) for the chosen voltage to the AMPS for the desired voltage. The formula would be:

$$\frac{65 * 240}{415} = 37.59\ AMPS$$

LINEN CARTS

Linen Cart Capacity Chart

Select the proper cart size(s) to match your washer-extractors. Matching the carts to the washers makes it easy to get a full washer load of soiled goods without using a scale. Use this chart to find cart sizes.

CART SIZE		CLEAN DRY WEIGHT (LBS)		
Bushels	Ft³	Dry Soiled	Wet Extracted	Folded
6	7.5	37	75	89
8	10.0	49	99	119
10	12.4	62	124	149
12	14.9	75	149	179
14	17.4	87	175	209
16	19.9	99	199	237
18	22.4	112	224	268
20	24.9	124	249	298
24	29.9	149	299	358
28	34.8	174	349	417

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SPACE ALLOCATION

LAUNDRY SPACE ALLOCATION

The guidelines that follow are based on laundry located in a free standing totally self contained building. Further assumptions are that the laundry operates 5 days per week, 8 hours per day. Functional areas which are not required should be subtracted from the total estimated area.

LAUNDRY FUNCTIONAL AREA	SQ. FT. required per lbs. processed Per day	% OF TOTAL Ft ² .
A. Administrative & office	<u>0.0167</u>	<u>2.78%</u>
TOTAL ADMINISTRATION	0.0167	2.78%
B. Employee		
1. Restroom & lockers	<u>0.0131</u>	<u>2.19%</u>
2. Lunch room & lounge	<u>0.0180</u>	<u>3.00%</u>
TOTAL EMPLOYEE	0.0311	5.19%
C. Mechanical Room:		
1. Maintenance	<u>0.0060</u>	<u>1.00%</u>
2. Bulk salt storage	<u>0.0190</u>	<u>3.17%</u>
3. Chemical storage	<u>0.0191</u>	<u>3.18%</u>
4. Equipment area	<u>0.0350</u>	<u>5.84%</u>
TOTAL MECH. ROOM	0.0791	13.19%
D. Non-production:		
1. Soil cart processing	<u>0.0115</u>	<u>1.92%</u>
2. Sewing & mending	<u>0.0163</u>	<u>2.71%</u>
3. New linen inventory	<u>0.0218</u>	<u>3.63%</u>
TOTAL NON-PROD.	0.0496	8.26%
E. Production:		
1. Dock and loading	<u>0.0188</u>	<u>3.13%</u>
2. Soiled linen storage	<u>0.0925</u>	<u>15.42%</u>
3. Processing	<u>0.2639</u>	<u>43.99%</u>
4. Clean cart storage	<u>0.0482</u>	<u>8.04%</u>
TOTAL PRODUCTION	0.4235	70.58%
GRAND TOTAL	<u>.6000</u>	<u>100%</u>

EXAMPLE: A freestanding laundry must process 4000 lbs of linen/hr. How large should the laundry be? The answer is 19,200 ft².

$$4000 \text{ lbs / hr} \times 8 \text{ hour day} = 32,000 \text{ lbs / 8 hour day}$$

$$32,000 \text{ lbs / 8 hour day} \times .6 \text{ ft}^2 / \text{lbs processed / day} = 19,200 \text{ ft}^2$$

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TYPICAL LINEN WEIGHTS

*Weight lb per piece

DUST CONTROL

DUST MOPS		
12"	100% COTTON	0.55
18"	100% COTTON	0.98
	50% POLYESTER/50% COTTON	0.8
24"	100% COTTON	1.09
	50% POLYESTER/50% COTTON	0.82
30"	100% COTTON	1.4
36"	100% COTTON	1.54
	50% POLYESTER/50% COTTON	1.78
42"	100% COTTON	1.6
48"	100% COTTON	2.42
	50% POLYESTER/50% COTTON	2.51
60"	100% COTTON	2.38
ENTRANCE MATS		
2' x 3'	COTTON/LATEX	3.22
	SYNTHETIC/RUBBER	4.42
3' X 4'	SYNTHETIC/RUBBER	5.64
3' X 5'	COTTON/LATEX	5.8
	SYNTHETIC/RUBBER	11.4
3' X 10'	COTTON/LATEX	11.2
	SYNTHETIC/RUBBER	17.3
4' X 6'	COTTON/LATEX	12
	SYNTHETIC/RUBBER	13
4' X 8'	COTTON/LATEX	13.3
	SYNTHETIC/RUBBER	17.8
5' X 8'	COTTON/LATEX	13.9
DUST CLOTHS		
18" x 24"	100% COTTON	0.16
	BLEND	0.13
SWEEP TOOL COVERS		
36" X 36"	100% COTTON	0.27

LINEN SUPPLY FLATWORK

APRONS		
APRONS - BAR/WAIST	100% COTTON	0.32
	65% POLYESTER/35% COTTON	0.33
	50% POLYESTER/50% COTTON	0.33
BIB	100% COTTON	0.4
	65% POLYESTER/35% COTTON	0.32
	50% POLYESTER/50% COTTON	0.33

FOUR-WAY	65% POLO	0.3
	50% POLYESTER/50% COTTON	0.31
MECHANICS	100% COTTON	0.48
SHOP, DENIM	100% COTTON	0.52
	50% POLYESTER/50% COTTON	0.55
TEA, WAITRESS	100% COTTON	0.19
MISCELLANEOUS FLAT GOODS		
HAIR CLOTHS	100% COTTON	0.35
	50% POLYESTER/50% COTTON	0.38
DIAPERS	100% COTTON	0.55
LAUNDRY BAGS		
30" X 45"	65% POLYESTER/35% COTTON	0.91
TABLE LINEN		
NAPKINS, CORDED		
18" X 18"	100% COTTON	0.06
NAPKINS, MOMIE		
18" X 18"	100% COTTON	0.09
20" X 20"	100% COTTON	0.12
22" X 22"	100% COTTON	0.11
	50% POLYESTER/50% COTTON	0.11
NAPKINS, DAMASK		
20" X 20"	100% COTTON	0.11
	100% POLYESTER	0.12
TABLECLOTHES, MOMIE		
45" X 45"	100% COTTON	0.5
54" X 54"	100% COTTON	0.75
63" X 63"	100% COTTON	1.06
72" X 72"	100% COTTON	1.28
81" X 81"	100% COTTON	1.74
90" X 90"	100% COTTON	2.05
TABLECLOTHES, DAMASK		
54" X 54"	100% COTTON	0.73
63" X 63"	100% COTTON	0.79
72" X 72"	100% COTTON	1.09
	100% POLYESTER	1.23
81" X 81"	100% POLYESTER	2.1
BANQUET CLOTHS, MOMIE - 54" WIDTH		
6'	100% COTTON	1.07
8'	100% COTTON	1.36
10'	100% COTTON	1.67

BEDDING

SHEETS, SINGLE			
63" X 100"	50% POLYESTER/50% COTTON	0.91	
66" X 115"	65% POLYESTER/35% COTTON	1.16	
	50% POLYESTER/50% COTTON	1.34	
SHEETS, TWIN			
72" X 100"	65% POLYESTER/35% COTTON	1.18	
	50% POLYESTER/50% COTTON	1.18	
SHEETS, DOUBLE			
81" X 100"	65% POLYESTER/35% COTTON	1.34	
	50% POLYESTER/50% COTTON	1.42	
81" X 104"	50% POLYESTER/50% COTTON	1.44	
81" X 108"	65% POLYESTER/35% COTTON	1.27	
SHEETS, QUEEN			
	50% POLYESTER/50% COTTON	1.7	
PILLOWCASES			
42" X 33"	50% POLYESTER/50% COTTON	0.24	
	100% COTTON	0.26	
	65% POLYESTER/35% COTTON	0.23	
42" X 36"	50% POLYESTER/50% COTTON	0.25	
BEDSPREAD, SINGLE			
	100% COTTON	1.84	
BLANKETS, SINGLE			
	100% COTTON	2.22	

TOWELS

NONTERRY - BANK, CLUB, DOCTOR, OFFICE			
14" X 21"	100% COTTON	0.09	
14" X 25"	100% COTTON	0.14	
NONTERRY - BARBER/BEAUTY			
15" X 27"	100% COTTON	0.16	
NONTERRY -DISH TOWELS			
36" X 24"	100% COTTON	0.19	
36" x 30"	100% COTTON	0.14	
NONTERRY - GLASS TOWELS			
15" X 27"	100% COTTON	0.11	
NONTERRY - HAND TOWELS			
16" X 30"	100% COTTON	0.18	
16" X 32"	100% COTTON	0.15	
NONTERRY - KITCHEN TOWELS			
15" X 26"	100% COTTON	0.11	
	50% POLYESTER/50% COTTON	0.1	

BAR MOPS/SWIPES, RIBBED			
20" X 17"	100% COTTON	0.13	
CONTINUOUS TOWELS			
40-50 YARDS	100% COTTON	4.36	
	80% POLYESTER/20% COTTON	3.99	
	71% POLYESTER/29% COTTON	4.36	
	50% POLYESTER/50% COTTON	3.75	
TERRY			
BATH MATS			
18" X 24"	100% COTTON	0.51	
20" X 30"	100% COTTON	0.54	
BATH TOWELS			
20" X 40"	100% COTTON	0.4	
20" X 44"	100% COTTON	0.49	
22" X 44"	100% COTTON	0.54	
MASSAGE/HAND			
15" X 25"	100% COTTON	0.19	
16" X 26"	100% COTTON	0.19	
WASHCLOTHS, FACE			
12" X 12"	100% COTTON	0.06	
LINEN SUPPLY GARMENTS			
CAPS, CHEF			
	100% COTTON	0.24	
	65% POLYESTER/35% COTTON	0.25	
COATS, LONG			
FROCKS, LONG SLEEVE	65% POLYESTER/35% COTTON	1.23	
FROCKS, 3/4 SLEEVE	65% POLYESTER/35% COTTON	1.43	
LUGGER, MEAT/BUTCHER	50% POLYESTER/50% COTTON	1.24	
SHOP COAT	65% POLYESTER/35% COTTON	1.35	
WRAPAROUND, LONG SLEEVE	65% POLYESTER/35% COTTON	0.74	
WRAPAROUND, 3/4 SLEEVE	65% POLYESTER/35% COTTON	0.87	
COATS, SHORT			
CHEF, LONG SLEEVE	65% POLYESTER/35% COTTON	0.94	
CHEF, SHORT SLEEVE	65% POLYESTER/35% COTTON	0.87	
COUNTER/WAITER, LONG SLEEVE	65% POLYESTER/35% COTTON	0.98	
DOCTOR (SIDE BUTTON), LONG SLEEVE	65% POLYESTER/35% COTTON	0.52	
DOCTOR (SIDE BUTTON), SHORT SLEEVE	65% POLYESTER/35% COTTON	0.61	
JACKETS, BARTENDER, LONG SLEEVE	65% POLYESTER/35% COTTON	0.91	
JACKETS, BUS BOY, LONG SLEEVE	65% POLYESTER/35% COTTON	0.89	
JACKETS, LAPEL, LONG SLEEVE	65% POLYESTER/35% COTTON	0.75	
VESTS, NO SLEEVE	65% POLYESTER/35% COTTON	0.49	

DRESSES			
BELTED, SHORT SLEEVE	65% POLYESTER/35% COTTON	0.68	
PRINCESS, LONG SLEEVE	65% POLYESTER/35% COTTON	0.74	
PRINCESS, SHORT SLEEVE	65% POLYESTER/35% COTTON	0.76	
GOWN, ARTIST'S			
NOT-FITTED, LONG SLEEVE	65% POLYESTER/35% COTTON	0.66	
SEMI-FITTED, LONG SLEEVE	65% POLYESTER/35% COTTON	0.7	
SEMI-FITTED, 3/4 SLEEVE	65% POLYESTER/35% COTTON	0.64	
SHIRTS			
KITCHEN, SHORT SLEEVE	65% POLYESTER/35% COTTON	0.49	
PANTS SUITS			
TOPS, SHORT SLEEVE			
SLEEVE	65% POLYESTER/35% COTTON	0.58	
SLACKS	65% POLYESTER/35% COTTON	0.89	
PANTS/TROUSERS			
CHEF'S	65% POLYESTER/35% COTTON	1.01	
COOK'S	65% POLYESTER/35% COTTON	1.02	
INDUSTRIAL FLAT GOODS			
SHOP TOWELS			
18" X 18"	100% COTTON	0.06	
	BLEND	0.06	
18" X 30"	100% COTTON	0.11	
FENDERS COVERS			
36" X 60"	100% COTTON	0.82	
	50% POLYESTER/50% COTTON	0.66	
	100% POLYESTER	0.8	
SEAT COVERS			
60" X 72"	50% POLYESTER/50% COTTON	1.53	
INDUSTRIAL GARMENTS			
WORK APPAREL			
COVERALLS			
HEAVYWEIGHT	65% POLYESTER/35% COTTON	1.88	
LIGHTWEIGHT	65% POLYESTER/35% COTTON	1.46	
JACKETS			
EISENHOWER	65% POLYESTER/35% COTTON	1.46	
HIP LENGTH	65% POLYESTER/35% COTTON	1.78	
WAIST LENGTH	65% POLYESTER/35% COTTON	1.59	
JUMPSUIT/SPEEDSUIT			
LONGSLEEVE	65% POLYESTER/35% COTTON	1.12	
SHORTSLEEVE	65% POLYESTER/35% COTTON	1.02	
PANTS/TROUSERS			
	65% POLYESTER/35% COTTON	1.15	
SHIRTS			
LONGSLEEVE	65% POLYESTER/35% COTTON	0.59	
SHORTSLEEVE	65% POLYESTER/35% COTTON	0.55	

EXECUTIVE APPAREL			
SHIRTS			
LONGSLEEVE	65% POLYESTER/35% COTTON	0.59	
SHORTSLEEVE	65% POLYESTER/35% COTTON	0.41	
SLACKS/PANTS			
	65% POLYESTER/35% COTTON	0.97	
	100% POLYESTER	1.08	
HEALTHCARE FLATWORK			
BEDDING			
BEDSPREAD, SINGLE			
70" X 90"	100% COTTON	1.43	
72" X 90"	100% COTTON	1.77	
BLANKET, BABY			
30" X 40"	100% COTTON	0.26	
36" X 40"	100% COTTON	0.17	
BLANKET, BATH/ETHER/SHEET			
70" X 90"	100% COTTON	1.37	
BLANKET, THERMAL			
66" X 90"	100% COTTON	2.33	
INCONTINENCE PAD			
24" X 36"	100% COTTON	0.89	
34" X 36"	100% COTTON	1.31	
MATRESS PAD			
39" X 76"	100% COTTON	1.62	
PILLOWCASES			
42" X 33"	65% POLYESTER/35% COTTON	0.23	
	50% POLYESTER/50% COTTON	0.25	
42" X 36"	65% POLYESTER/35% COTTON	0.22	
	50% POLYESTER/50% COTTON	0.25	
SHEETS, DRAW			
54" X 81"	65% POLYESTER/35% COTTON	0.59	
SHEETS, SINGLE			
66" X 104"	50% POLYESTER/50% COTTON	1.06	
66" X 115"	65% POLYESTER/35% COTTON	1.07	
	50% POLYESTER/50% COTTON	1.29	
TERRY TOWELS			
BATH MATS			
20" X 30"	100% COTTON	0.57	
BATH TOWEL			
20" X 40"	100% COTTON	0.45	
FACE TOWEL			
16" X 26"	100% COTTON	0.2	
WASHCLOTH			
12" X 12"	100% COTTON	0.07	

SURGICAL/OPERATING ROOM FLATWORK			
WRAPPERS			
24" X 24"	100% COTTON		0.2
36" X 36"	100% COTTON		0.53
54" X 54"	100% COTTON		0.9
HEALTHCARE GARMENTS			
ADULT PATIENT APPAREL			
GOWNS			
BATHROBE	65% POLYESTER/35% COTTON		0.79
ISOLATION	50% POLYESTER/50% COTTON		0.48
O.R.	50% POLYESTER/50% COTTON		0.63
PATIENT	100% COTTON		0.5
	65% POLYESTER/35% COTTON		0.4
INFANT PATIENT APPAREL			
SHIRTS	100% COTTON		0.08
SURGICAL/OPERATING ROOM GARMENTS			
PANTS SUIT, TWO-PIECE	50% POLYESTER/50% COTTON		0.81
SCRUB DRESS	100% COTTON		0.54
SCRUB SUIT	100% COTTON		0.9
SURGEON/NURSE GOWN	100% COTTON		1.8

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HOTEL / MOTEL LAUNDRY TASK INFORMATION

OPERATION:		HOURS/DAY:		HOURS/WEEK:			
		DAYS/WEEK:		HOURS/YEAR:			
SINGLE BED:		NUMBER:		% OCCUPANCY:		OCCUPIED:	
ROOM LINEN ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION		
					FLATWORK LBS/HR	FULL-DRY LBS/HR	
MATTRESS COVER		2.75					
SINGLE SHEET		1.25					
PILLOW CASE		0.30					
BATH TOWEL		0.60					
HAND TOWELS		0.20					
WASH CLOTH		0.05					
BATH MAT		1.50					
BED SPREAD		3.50					
BLANKET		3.75					
SHOWER CURTAIN		1.25					
BATH ROBE		3.00					
DOUBLE BED:		NUMBER:		% OCCUPANCY:		OCCUPIED:	
ROOM LINEN ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION		
					FLATWORK LBS/HR	FULL-DRY LBS/HR	
MATTRESS COVER		2.75					
SINGLE SHEET		1.75					
PILLOW CASE		0.30					
BATH TOWEL		0.60					
HAND TOWELS		0.20					
WASH CLOTH		0.05					
BATH MAT		1.50					
BED SPREAD		3.50					
BLANKET		3.75					
SHOWER CURTAIN		1.25					
BATH ROBE		3.00					
QUEEN BED:		NUMBER:		% OCCUPANCY:		OCCUPIED:	
ROOM LINEN ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION		
					FLATWORK LBS/HR	FULL-DRY LBS/HR	
MATTRESS COVER		2.75					
SINGLE SHEET		2.00					
PILLOW CASE		0.30					
BATH TOWEL		0.60					
HAND TOWELS		0.20					
WASH CLOTH		0.05					
BATH MAT		1.50					
BED SPREAD		4.50					
BLANKET		4.50					
SHOWER CURTAIN		1.25					
BATH ROBE		3.00					

HOTEL / MOTEL LAUNDRY TASK INFORMATION cont.						
KING BED:	NUMBER:		% OCCUPANCY:		OCCUPIED:	
ROOM LINEN ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION FLATWORK LBS/HR	FULL-DRY LBS/HR
MATTRESS COVER		4.20				
SINGLE SHEET		2.25				
PILLOW CASE		0.30				
BATH TOWEL		0.60				
HAND TOWELS		0.20				
WASH CLOTH		0.05				
BATH MAT		1.50				
BED SPREAD		5.25				
BLANKET		5.25				
SHOWER CURTAIN		1.25				
BATH ROBE		3.00				
FOOD & BEVERAGE LINEN						
FOOD BEVERAGE ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION FLATWORK LBS/HR	FULL-DRY LBS/HR
TABLE CLOTH 45"		0.60				
TABLE CLOTH 54"		0.88				
TABLE CLOTH 64"		1.20				
TABLE CLOTH 72"		1.15				
TABLE CLOTH 90"		2.20				
T. CLOTH 54" X 96"		1.50				
T. CLOTH 54" X 120"		1.83				
T. CLOTH 54" X 144"		2.30				
NAPKINS 18" X 18"		0.01				
NAPKINS 20" X 20"		0.01				
NAPKINS 22" X 22"		0.01				
CHEF'S PANTS		1.15				
CHEF'S COAT		0.65				
KITCHEN SHIRT		0.49				
CHEF'S HAT		0.07				
BIB APRON		0.45				
HOOVER APRON		0.82				
WAIST APRON		0.36				
SMOCK		0.74				
FROCK		1.11				
COVERALLS		2.84				
PANTS		1.27				
SHIRTS		0.56				
DISH TOWEL		0.10				
GLASS TOWEL		0.14				
KITCHEN TOWEL		0.15				
GRILL WIPES		0.12				
DUST MOPS 12"		0.50				
DUST MOPS 18"		0.75				
DUST MOPS 24"		1.00				
DUST CLOTHS		0.18				
SHOP TOWELS		0.08				
WET MOPS		0.20				

HOTEL / MOTEL LAUNDRY TASK INFORMATION cont.

POOL - BEACH - HEALTH CLUB

POOL - BEACH HEALTH CLUB ARTICLES	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
BEACH TOWELS		3.00				
LARGE TOWELS		2.00				
BATH TOWELS		0.75				
HAND TOWELS		0.30				
WASH CLOTH		0.10				
ROBE		3.00				

RESUME OF LAUNDRY PRODUCTION TASK

AREA GENERATING LINEN	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
			LATWOR LBS./HR.	FULL-DRY LBS./HR.
SINGLE BED				
DOUBLE BED				
QUEEN BED				
KING BED				
FOOD & BEVERAGE				
POOL BEACH, ETC.				

PERSON TO CONTACT;

ADDRESS:

CITY:

STATE:

ZIP CODE:

PHONE:

FAX:

E-MAIL:

UTILITIES

WATER:

RATE:

INCOMING TEMP.:

DEGREE HARDNESS:

PRESSURE:

SEWER:

RATE:

GAS:

TYPE:

RATE:

ELECTRICITY

RATE

NOTES:

PRISON / JAIL LAUNDRY TASK INFORMATION

OPERATION _____ HOURS/DAY: _____ DAYS/WEEK: _____

POPULATION: _____ MALE: _____ FEMALE: _____

BED LINEN:

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
SINGLE BED SHEET		1.25				
PILLOW CASE		0.30				
BATH TOWEL		0.50				
BLANKET		3.00				
PILLOW		1.60				
TOTALS						

MALE UNIFORMS

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
COVERALLS		2.50				
PANTS (KHAKI)		1.50				
PANTS (JEANS)		1.75				
SHIRT		0.75				
JACKET		2.00				
TOTALS						

FEMALE UNIFORMS

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
COVERALL		2.50				
PANTS (KHAKI)		1.50				
PANTS (JEANS)		1.75				
SHIRT		0.75				
DRESS		1.40				
JACKET		2.00				
TOTALS						

PERSONAL CLOTHING: MALE INMATES

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
SWEAT PANTS		3.00				
SWEAT SHIRT		2.50				
SHORTS		0.35				
T-SHIRT		0.25				
HANDKERCHIEF		0.10				
PR.SOCKS		0.01				
SWEATER		1.50				
TOTALS						

PERSONAL CLOTHING: FEMALE INMATES

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
PANTS		1.25				
SKIRT		1.00				
BLOUSE		0.65				
DRESS		1.50				
SWEAT PANTS		3.00				
SWEAT SHIRT		2.50				
PANTIES		0.03				
BRA		0.40				
HANKERCHIEF		0.10				
PR. SOCKS		0.01				
SWEATER		1.50				
TOTALS						

PRISON / JAIL LAUNDRY TASK INFORMATION cont.

FOOD SERVICE:

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
COOK'S PANTS		1.15				
COOK'S COATS		1.00				
COOK'S HAT		0.15				
COOK'S HANDKERCHIEF		0.15				
COOK'S APRONS		0.75				
KITCHEN TOWELS		0.15				
GRILL WIPES		1.50				
MOPS		0.12				
TABLE CLOTHS		0.15				
NAPKINKS		0.12				
TOTALS						

INFIRMARY:

LINEN ARTICLE	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TOTAL POUNDS HOUR	TASK CLASSIFICATION	
					FLATWORK LBS/HR	FULL-DRY LBS/HR
SINGLE BED SHEET		1.25				
PILLOW CASE		0.30				
BATH TOWEL		0.50				
BLANKET		3.00				
PILLOW		1.60				
PAJAMA		1.25				
TOTALS						

PERSON TO CONTACT:

ADDRESS:

CITY:	STATE	ZIP CODE:
PHONE:	FAX:	E-MAIL:

UTILITIES

WATER:	RATE:	INCOMING TEMPERATURE:
	DEGREE HARDNES:	PRESSURE:
SEWER:	RATE:	
GAS:	TYPE	RATE:
ELECTRICITY:	RATE	

NOTE:

NURSING HOME LAUNDRY TASK INFORMATION

OPERATION:	HOURS/DAY:		HOURS/DAY:		HOURS/WEEK:	
	No. of BEDS: .		DAYS/WEEK:			
LINEN ARTICLES TO BE WASHED	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TASK POUNDS HOUR	CLASSIFICATION	
					FLATWORK LBS./HR.	FULL-DRY LBS./HR.
SHEET, REGULAR		1.41				
SHEET, DRAW		0.85				
SHEET, FITTED (REG.)		0.96				
SHEET FITTED		1.14				
PILLOW CASE		0.28				
PILLOW COVER		0.38				
FITTED MATTRESS PAD		1.72				
UNDERPAD, W. P.		0.80				
THERMAL BLANKET		3.32				
BATH BLANKET		1.29				
CRINKLE BED SPREAD		1.31				
CORDED BED SPREAD		2.38				
ADULT DIAPER SM		1.25				
ADULT DIAPER MD.		1.75				
ADULT DIAPER LG.		2.00				
SPREAD BLANKET		3.25				
BATH TOWEL		0.46				
HAND TOWEL TERRY		0.19				
BATH MAT		0.62				
WASH CLOTH		0.04				
LAUNDRY BAG		1.25				
PATIENT GOWN		0.50				
PAJAMA TOP		0.62				
PAJAMA BOTTOM		0.42				
PILLOW		1.80				
CUBICLE CURTAINS		0.69				
BUFFER PADS		2.00				
BIB APRON		0.29				
DISH TOWELS		0.08				
BAR TOWELS		0.21				
ENTRANCE MATS 3 X 4		5.58				
ENTRANCE MATS 3 X 5		7.99				
HAND DUSTER		0.60				
WET MOP SMALL		0.80				
WET MOP MEDIUM		1.25				
WET MOP LARGE		1.50				
DUST MOP 14"		0.68				
DUST MOP 24:		1.80				
DUST MOP 36"		2.00				

NURSING HOME LAUNDRY TASK INFORMATION cont.

PERSON TO CONTACT:

ADDRESS:

CITY: STATE: ZIP CODE:

PHONE: FAX: E-MAIL:

UTILITIES:

WATER: RATE: INCOMING TEMP.

DEGREE HARDNESS: PRESSURE:

SEWER: RATE:

GAS: TYPE: RATE:

ELECTRICITY: RATE: VOLTAGE:

DISPOSABLES

DIAPERS

BED PADS

WILL THEIR USE CONTINUE

DO YOU ANTICIPATE CHANGING TO LAUNDERABLE TYPE:

HOW SOON

NOTES:

HOSPITAL LAUNDRY TASK INFORMATION

OPERATION:	HOURS/DAY:		DAYS/WEEK		HOURS/WEEK	
TYPE & NUMBER OF PATIENTS	ACUTE		No.of BEDS		% OCCUPANCY	
	AMBULATORY		No.of BEDS		% OCCUPANCY	
LINEN ARTICLES TO BE WASHED	QUANTITY USED PER WEEK	UNIT WEIGHT POUNDS	TASK POUNDS WEEK	TASK POUNDS HOUR	CLASSIFICATION	
					FLATWORK LBS./HR.	FULL-DRY LBS./HR.
O.R.SHEET		1.95				
O.R.DRAW SHEET		1.10				
O.R.PILLOW		0.24				
O.R.TOWEL		0.28				
MAYO COVER		0.68				
WRAPPER 15 X 15		0.24				
WRAPPER 24 X 24		0.30				
WRAPPER 36 X 36		0.42				
WRAPPER 45 X 45		0.54				
WRAPPER 54 X 54		1.23				
WRAPPER 54 X 72		1.50				
WRAPPER 66 X 72		2.00				
DRAPES, MINOR		0.40				
LAPAROTOMY		2.25				
GYM (W/LEGS)		1.64				
VAGINAL		1.65				
SPLIT/THYROID		1.97				
BREAST DRAPE		2.16				
GENERAL SPINAL		0.52				
LEGGINS		1.19				
GOWN SURGICAL		1.20				
GOWN BARRIER		1.38				
SHIRT SCRUB		0.53				
PANTS SCRUB		0.78				
SPREAD BLANKET		3.25				
BATH TOWEL		0.46				
HAND TOWEL TERRY		0.19				
TOWEL DR./LAB.		0.22				
BATH MAT		0.62				
WASH CLOTH		0.04				
BABY DIAPER		0.15				
BABY DIAPER		0.70				
CRIB SHEET		0.70				
CRIB SHEET		1.20				
LAUNDRY BAG		1.00				
LAUNDRY BAG		1.25				
PATIENT GOWN		0.50				
X-RAY GOWN		0.66				
ISOLATION GOWN		0.69				
PAJAMA TOP		0.62				
PAJAMA BOTTOM		0.42				
INFANT GOWN		0.20				
CHILD GOWN		0.22				
PAJAMA TOP CHILD		0.51				
PAJAMA BOTTOM CHILD		0.35				
BABY SHIRT S/S		0.11				

HOSPITAL LAUNDRY TASK INFORMATION cont.

LINEN ARTICLES TO BE WASHED	QUANTITY	UNIT	TASK	TASK	CLASSIFICATION	
	USED	WEIGHT	POUNDS	POUNDS	FLATWORK	FULL-DRY
	PER WEEK	POUNDS	WEEK	HOUR	LBS./HR.	LBS./HR.
BABY SHIRT MITTEN CUFF		0.11				
BABY BLANKET		0.34				
TUNIC SCRUBB		0.40				
SLACK SCRUBB		0.50				
DRESS SCRUBB		0.88				
WARM-UP JACKET FEMALE		0.58				
WARM-UP JACKET MALE		0.51				
LAPEL COAT		0.83				
LAB COAT		0.75				
PANTSUIT TOPPER		1.14				
SLACKS PANTSUIT		0.66				
PRINCESS GOWN		0.79				
SHEET REGULAR		1.41				
SHEET FITTED		0.95				
SHEET FITTED		1.14				
PILLOW CASE		0.28				
PILLOW COVER		0.37				
FITTED MATTRESS PAD		1.72				
UNDERPAD W.P.		0.80				
THERMAL BLANKET		3.32				
BATH BLANKET		1.29				
CRINKLE BED SPREAD		1.31				
CORDED BED SPREAD		2.37				
BIB APRON		0.29				
DISH TOWELS		0.08				
BAR TOWELS		0.21				
ENTRANCE MATS 3 X 4		5.58				
ENTRANCE MATS 3 X 5		7.99				
HAND DUSTER		0.80				
WET MOP SMALL		0.80				
WET MOP MEDIUM		1.25				
WET MOP LARGE		1.50				
DUST MOP 14"		0.69				
DUST MOP 24"		1.80				
DUST MOP 36"		2.00				
BUFFER PADS		2.00				
PILLOWS		1.80				
PILLOW COVERS		1.75				
CUBICLE CURTAINS		0.70				
PERSON TO CONTAC:						
ADDRESS:						
CITY:		STATE			ZIP CODE:	
TELEPHONE:		FAX:			E-MAIL:	
UTILITIES						
WATER:		RATE:			INCOMING TEMP.:	
		DEGREE HARDNESS:			PRESSURE:	
SEWER:		RATE:				
GAS		TYPE:			RATE:	
ELECTRICITY:		RATE			VOLTAGE:	
NOTES						

Laundry Machinery Installation Check List

DATE: _____

Customer Name: _____ Title: _____

Company Name: _____

Address: _____ City: _____ State: ____ Zip: _____

Telephone: _____ Fax: _____ E-Mail: _____

Type of Facility: _____

Laundry Room Data

Overall room size: _____ x _____ Ceiling Height: _____

Foundation Thickness: _____ Condition: New floor Existing solid floor Floor w/cracking

Concrete pad needed: _____ Pad dimensions: _____ w x _____ d x _____ h

Steel base needed: _____ Height of steel mounting bases: _____

Smallest Access Door Size: _____ Doorjamb Removable? _____ Window Size: _____

Notes: _____

Gas Service

None Natural Gas Propane Supply Line Size: _____ Pressure: _____

Adequate Supply? _____ Distance to Install: _____

Notes: _____

Electrical Service

Voltage: _____ Phase: _____ Available Amperage: _____ Distance: _____

Breaker Panel Access: _____ Model/Type Panel: _____ Space Available: _____

Notes: _____

Steam Service

Available? _____ Pressure?: _____ Distance to eqpt.: _____

Notes: _____

Water Supply

Pipe Sizes: Cold: _____ Hot: _____ PSI of Supply: _____ Hot Storage Tank Size: _____

Distance to Installation: _____ Adequate Hot Water Supply? _____

New Heater Required? _____ Size Required: _____ Hardness/Grain: _____

Notes: _____

Drain Specs

Size: _____ Height of Drain: _____ Distance to install: _____

Trough: _____ Size: _____ Location of Trough: _____

Sump Pump Required: _____

Notes: _____

Venting Specs

Number of Existing Vents: _____ Size: _____ New Vent Required: _____

Size: _____ Length of New Run: _____ Bends: _____

Type of Wall: _____ Thickness: _____ Type of Ceiling: _____ Thickness: _____

Makeup Air Available: _____ Square Inches/Feet: _____ Length of Run: _____

Notes: _____

Chemical specs

Will they use liquid or powder chemicals: _____ Both: _____

Existing Supplier: _____

Notes: _____

Other Information

Loading Dock: _____ Loading Dock Height: _____ Distance to Install: _____

Elevator: _____ Size of Elevator: _____ Capacity of Elevator: _____

Sharp turns or corners to navigate? _____ Steps?/How many? _____

Smallest access door or opening: _____

Rigging required? _____ Fork lift available: _____ Capacity: _____

Notes: _____

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GUIDELINES FOR SIZING WASH ROOM EQUIPMENT

Obtaining actual item, quantity and weight data is the professional approach to sizing a laundry operation. Actual data will also prevent you from committing crucial errors, since there are facilities with figures that vary greatly with the "RULES OF THUMB" mentioned herein. However, if exact figures are not available, the following rules of thumb may be used as "GUIDES".

A. DEFINING THE TASK:

1-HOTEL/MOTEL

a. Formula

$$\frac{\text{Lbs./ room / day} \times \text{No. rooms} \times 7 \text{ days} \times \% \text{ occupancy}}{\text{operating hours / week}} = \text{Lbs./ hr.}$$

b. Use Data:

<u>Type Hotel/Motel</u>	<u>Usage lbs./room/day</u>
Budget (Motel 6)	8
Standard (Holiday Inn)	10
Luxury (Four Seasons, Hyatt)	12

c. Occupancy:

Typically chosen 80%

d. Operating Hours/Week::

Typically chosen as 40 hours/wk.

e. Example:

150 room standard hotel
No food and beverage
80 % occupancy
40 hrs./wk operating hours

$$\frac{10 \text{ lbs./ room} \times 150 \text{ rooms} \times 7 \text{ days} \times 80\% \text{ occupancy}}{40 \text{ hrs./ wk.}}$$

NOTE:

Some resort (beach) hotels have been known to use 22 lbs./room per day, have occupancy rates of 95% +, and operate 7 days/wk.

2-NURSING HOME:

$$\frac{\text{Lbs./bed / day} \times \text{number of beds} \times 7 \text{ days / wk} \times \text{occupancy \%}}{\text{Operating hours / week}} = \text{lbs / hr.}$$

b. Use Data:

8 lbs./bed/day if reusable adult diapers
6 lbs./bed/day if disposable adult diapers

c. Occupancy:

Typically chosen as 95%

d. Operating hours/week:

Typically chose as 40 hours/wk.

e. Example:

60 beds
Reusable adult diapers
85% occupancy (customer specified)
37.5 hours/wk operating hours (customer specified)

$$\frac{8 \text{ lbs / bed / day} \times 60 \text{ beds} \times 7 \text{ days / wk} \times 85\%}{37.5 \text{ hours / week}} = 76.2 \text{ lbs / hr.}$$

3-HOSPITAL:

a. Formula:

$$\frac{\text{lbs / patient / day} \times \text{No. beds} \times 7 \text{ days / wk} \times \text{occupancy \%}}{\text{Operating hours / week}} = \text{lbs. / hr.}$$

b. Use Data:

18 lbs./patient/day for general hospitals
12 lbs./patient/day for psychiatric hospitals
add 2 lbs./patient/day if teaching hospital
add 2 lbs./patient/day for large outpatient clinic

c. Occupancy:

Typically chosen as 80%

d. Operating Hours/Week:

Typically chosen as 40 hrs./wk.

e. Example:

600 teaching hospital
70% occupancy (customer specified)
48 hrs. wk. (customer specified)

$$\frac{20 \text{ lbs} / \text{patient} / \text{day} \times 600 \text{ beds} \times 7 \text{ days} / \text{wk} \times 70\%}{48 \text{ hours} / \text{week}} = 1,225 \text{ lbs.} / \text{hr.}$$

4-PRISON:

a. Formula:

$$\frac{\text{lbs.} / \text{inmate} / \text{days} \times \text{number of beds} \times \text{days} / \text{wk} \times \text{occupancy} \%}{\text{Operating hours} / \text{week}} = \text{lbs.} / \text{hr.}$$

b. Use Data:

6 lbs./inmate/day with daily bed & uniform change
3 lbs./inmate/day if bed & uniform are changed 3 times/wk.
1.50 lbs./inmate/day if bed & uniform are changed one time/wk.

c. Occupancy:

Typically chosen as 100%.

d. Operating Hours/Week:

Typically chosen as 40 hrs./wk.

e. Example:

300 inmates 3 changes/wk
100% occupancy
40 hrs/wk

$$\frac{3 \text{ lbs / inmate / day } \times 300 \text{ beds } \times 7 \text{ days / wk } \times 100\%}{40 \text{ hours / week}} = 157.50 \text{ lbs. / hr}$$

5-DIVISION OF WORK:

- a. 65% flatwork (sheets, pillow cases, etc.)
- b. 30% dry fold (bath towels, wash cloth, etc.)
- c. 5% garments (uniforms)
- d. Some hospitals & nursing homes have sheets which are simply dried in a tumbler and folded. This change yields a division of work as follows:

15% flatwork
80% dry fold
5% garments

Obviously great care must be taken in assignment of %.

SIZING WASHROOM EQUIPMENT

*The following 2 charts (2 pages) should be printed on A3 sized paper, in a landscape view, for easy viewing.

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B SIZING WASHROOM EQUIPMENT

1-WASHER-EXTRACTORS

TEXTILE ARTICLES TO BE WASHED	PRODUCTION REQUIRED POUNDS/HOUR	EFFICIENCY FACTOR %	DESIGNED PRODUCTION POUNDS/HOUR	LOADS/HOUR		LOADING FACTOR %	POUNDS OF WASHER-EXTRACTOR CAPACITY REQUIRED
				DIVIDED CYLINDER WASHER-EXTRACTORS	OPEN POCKET		
sizing calculation formula symbols	a	b	(a / b) = c	d	e	f	g=c / (d or e)/f/b
WALK-ON MATS							
HOTEL (SHEETS & TOWELS)							
HEALTHCARE (SHEETS & TOWELS)							
TABLE LINEN							
SERVICE UNIFORMS							
INDUSTRIAL UNIFORMS							
MICRO DENIER FABRIC							
ADULT DIAPERS							
APRONS & BAR MOPS							
SHOP TOWELS							
BABY DIAPERS							
Total pounds of washer-extractor capacity required:							Lbs.

WASHER-EXTRACTOR SIZING CALCULATIONS SYMBOLS & FORMULAS

- a = Production required pounds/hour
- b = Efficiency factor
- c = Design production pounds/hour $(a / b) = c$
- d = Loads/hour divided cylinder washer-extractor
- e = Loads/hour open pocket washer-extractor
- f = Loading factor
- g = Pounds of washer-extractor capacity required to meet designed production $g = c/(d \text{ or } e)/f / b$

h Select machines & quantities to yield required capacity

MACHINE MODEL	TYPE	CAPACITY POUNDS	No. OF MACHINES	CAPACITY TOTAL POUNDS
30015	OPEN POCKET	40		
30022	OPEN POCKET	60		
36021	OPEN POCKET	80		
36026	OPEN POCKET	100		
42026	OPEN POCKET	140		
42030	OPEN POCKET	160		
42032	OPEN POCKET	170		
42044	DIVIDED CYLINDER	220		
48040	OPEN POCKET	275		
60044	DIVIDED CYLINDER	450		
68036	OPEN POCKET	450		
72044	DIVIDED CYLINDER	700		
72044	OPEN POCKET	700		
72046	OPEN POCKET	600		
Total pounds washer-extractor capacity: Lbs.				

NOTES:

- 1-STOP IF PROJECTED RATE IS EQUAL TO OR SLIGHTLY IN EXCESS OF DESIGN PRODUCTION REQUIRED.
- 2-IF PROJECTED RATE IS SIGNIFICANTLY IN EXCESS OF THE DESIGN PRODUCTION RATE, REEVALUATE.
- 3-IF THE PROJECTED RATE IS SIGNIFICANTLY LESS THAN THE DESIGN PRODUCTION RATE, INCREASE THE NUMBER AND / OR SIZE OF THE MACHINES SELECTED AND REEVALUATE.

2-CBW BATCH WASHERS

HOW TO SIZE A CBW BATCH WASHER

a	TOTAL PRODUCTION REQUIRED		lbs/hr
b	% OF PRODUCTION THROUGH CBW(s)		%
c	No. OF CBW WASHERS (TYPICALLY 1 UNLESS CUSTOMER REQUIRES MORE)		
d	PRODUCTION REQUIRED/CBW	$= (a \times b) / c$	lbs/hr
e	CBW EFFICIENCY FACTOR(85% TO 90%)		%
f	DESIGNED PRODUCTION REQUIRED	d/e	lbs/hr
g	BATCH SIZE: CHOOSE FROM 100, 110, & 130 LBS	¹	lbs/load
h	REQUIRED LOADS/HOUR	f/g	loads/hr
i	TIME BETWEEN TRANSFERS	60/h	min/load
j	FORMULA TIME	²	min
k	CALCULATED NO. OF MODULES/CBW	j/i	modules
l	RECOMMENDED No. OF MODULES/CBW	k (rounded-up)	modules

¹ Some items such as adult diapers, baby diapers, and thermal blankets are bulky and must run at approximately 85% to 90% of normal load size. This should only be of consequence if these items represent a large proportion (greater than 15% to 20%) of the total volume to be produced.

² Formula time may need to be increased for some goods if calculated number of modules is 7 or fewer. If in doubt, add one module.

3-AUTOMATIC BATCH DRYER SIZING

a	TOTAL DESIGN PRODUCTION/BATCHES RATE		pounds/hour
b	No. OF CAKES/DRYER		cakes/batch
c	DRYER SIZE		pounds/load
d	FULL-DRY WORK %		%
e	FULL-DRY DESIGN PRODUCTION RATE	$(a \times d) \div 100$	pounds/hour
f	FULL-DRY TIME		minutes
g	FULL-DRY LOADS/DRYER/HOUR	$60 \div f$	loads/dryer
h	FULL-DRY PRODUCTION/DRYER/HOUR	$c \times g$	pounds/hour
i	DRYERS REQUIRED FOR FULL-DRY	$e \div h$	dryers
j	CONDITIONED WORK %		%
k	COND. WORK DESIGN PRODUCTION RATE	$(a \times j) \div 100$	pounds/hour
l	CONDITIONING TIME		minutes
m	CONDITIONED LOADS/DRYER/HOUR	$60 \div l$	loads/dryer
n	CONDITIONING PRODUCTION/DRYER/HOUR	$c \times m$	pounds/hour
o	No. OF DRYERS REQUIRED FOR COND.	$k \div n$	dryers
p	TOTAL NUMBER OF DRYERS REQUIRED	$i + o$	dryers
q	RECOMMENDED No. OF DRYERS	p (rounded-up)+1	dryers

WASHER AND DRYER SIZING PARAMETERS

REPRESENTATIVE LINEN ITEMS	WASHER-EXTRACTOR		TYPICAL CBW FORMULA TIMES	TYPICAL PBW FORMULA TIMES	TYPICAL COND. TIMES GAS.*	TYPICAL FULL-DRY TIMES GAS.*	
	LOADING FACTOR CAPACITY	LOADS/HOUR					
		OPEN POCKET					DIVIDED CYLINDER
WALK-ON MATS	133%	1.5	1.2	14	14	10	
HOTEL SHEETS	100%	1.5	1.2	16	14	3	
HOTEL TOWELS	100%	1.5	1.2	18	16	21	
HEALTHCARE SHEETS	100%	1.3	1.04	18	16	3	
HEALTHCARE TOWELS	100%	1.3	1.04	18	16	18	
TABLE LINEN WHITE	100%	1.1	0.86	30	25	6	
TABLE LINEN COLORED	100%	1.3	1.06	24	23	6	
SERVICE SHIRTS WHITE	70%	1	0.8	32	28	0	
SERVICE SHERITS COLORED	70%	1.2	0.96	28	24	0	
SERVICE PANTS WHITE	100%	1.2	0.96	30	26	10	
SERVICE PANTS COLORED	100%	1.4	1.12	26	22	10	
INDUSTRIAL SHIRTS WHITE	70%	0.9	0.72	36	32	0	
INDUSTRIAL SHIRTS COLORED	70%	1.1	0.88	32	28	0	
INDUSTRIAL PANTS WHITE	100%	1	0.8	32	28	10	
INDUSTRIAL PANTS COLORED	100%	1.2	0.96	28	24	10	
MICRO DENIER FABRIC	65%	1	0.8	35	31	15	
ADULT DIAPERS	85%	1	0.8	24	19	24	
APRONS	100%	0.75	0.6	34	29	3	
BAR MOPS	100%	0.75	0.6	34	29	15	
SHOP TOWELS	100%	0.67	0.54	36	31	12	
BABY DIAPERS	85%	0.67	0.54	35	31	25	
* Steam dryers require 1/3 more time on average							

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WASH CHEMISTRY

Fundamental Wash Chemistry

WATER

Although it's commonly accepted that soiled laundry gets clean by a combination of time, temperature, chemical action, and mechanical action, the truth is that water is the single most important chemical used in laundering.

Its role is to remove soil from the textiles by the processes of dissolving and dilution. Time, temperature, chemical action, and mechanical action serve to enhance the role of water in removing soil.

Water's ability to dissolve a wide variety of substances makes it an effective cleaning agent for a large percentage of soils. Most substances are more soluble in water than in any other solvent.

Detergents and "builders" have been developed to enhance the cleansing action.

Water allows the action of the washer to be distributed though out the soiled load. It acts as a wetting agent penetrating the soil/fiber interfaces and removing the soil from the fabric. Water also carries chemical supplies to and from the textiles and carries away suspended soil.

Water is used in large quantities in all laundries. Water consumption per pound of work processed varies from less than one gallon per pound for light soils to more than four gallons per pound for very heavy soils.

WASHING CHEMICALS

Several different chemicals are used in washing or sudsing. These chemicals may be added as separate ingredients or as a formulated combination.

In proper chemical terms, detergents are a subclass of chemical compounds known broadly as surface-active agents or surfactants. All detergents are surface-active agents, but not all surfactants are detergents.

In the laundering industry the term "detergent" is usually used incorrectly to describe a manufactured product containing a surfactant and possibly other additives to aid in cleaning.

Very simply, detergency involves removing foreign substances (soil: the term "soil" refers to the normal insoluble soils that can be removed using conventional wash formulas. Soil that can't be removed and discolors the fabric is referred to as a "stain". Stains are generally removed by bleaching) from any surface. In laundering, the detergent function involves soil from textile fibers.

SURFACTANTS

While some soils can be removed from fiber surfaces with mechanical action and water alone, most can't be. This is where surfactants play a role.

The process of soil removal involves loosening and lifting soils from a fiber's surface and holding these soils in suspension until they can be removed by dilution. All laundering baths are a form of dilution.

The main function of a surfactant or surface-active is to suspend soil, although it also plays a key role in loosening soil.

In addition, surfactants act as wetting agents. Reducing water's surface tension enhances its ability to penetrate the textile fibers.

ALKALIES

Alkalies and alkaline salts are added to surfactants to assist in soil removal and soil suspension. For this reason, they are frequently referred to as builders or alkaline builders.

Textile detergency is most effective in an alkaline medium rather than acid. While some detergent processes use an acid medium, practically speaking, textile cleaning normally occurs in alkaline medium.

BLEACHES

Bleach has three roles in the laundering process: removing stains, sterilizing linens and maintaining whiteness.

Of the three roles, bleach is most effective in removing stains and killing bacteria and other microorganisms. It does have a whitening effect on cotton, but whiteness retention is best accomplished by proper washing procedures. The whitening action of bleach is simply a fortunate byproduct.

FINISHING CHEMICALS

Finishing chemicals are used after the bleaching process. This section describes chemicals used in the rinsing, souring and starching baths.

ANTICHLOR

Oxidizing agents (bleach) on textiles and can also effectively remove some dyes and stains.

In the laundering process, antichlor is applied during one of the rinse baths following bleaching to "strip" the last traces of chlorine bleach from the fabric. Low-temperature bleaching operations, in particular, may require an application of antichlor if tests show the presence of chlorine.

Antichlor is the sour bath also corrects problems created by textiles with chlorine-retentive finishes. If the retained chlorine is not neutralized by anti-chlor, the heat of drying or ironing converts the chlorine to an acid form that is very damaging to textiles-especially cotton.

SOURS

The main purpose of the souring is to neutralize residual alkalinity with a mild acid or acid salt. Residual alkalinity in textiles is caused by the alkalinity in tap water, carryover from alkalis and detergents, and/or hydrolysis of soap.

This residual alkalinity can cause:

- yellowing of white fabrics
- fading or dulling of colors,
- skin irritation, and/or
- odors.

Another purpose of the souring operation is to retard iron accumulation in textiles laundered in rust contaminated water. The souring operation also can help:

- remove some metallic stains,
- destroy some species of bacteria,
- set some classes of dyes, and
- maintain whiteness.

Sours are some the most hazardous chemicals commonly used in the washroom. Personnel must be properly trained in the safe handling and storage procedures specifies on the Material Safety Data Sheet (MSDS) for the particular sour being used.

FABRIC SOFTENERS

Fabric softeners have been used in textile manufacturing and finishing for many years to improve feel or hand and suppleness, and to reduce harshness of fabrics.

At one time, about the only textile maintenance operators to take advantage of these obvious benefits were diaper services. Now most launderers use softeners because they also act as lubricants, speeding extraction and conditions, improving shake-out prior to ironing, reducing or eliminating ironer static, and generally increasing fabric and zipper life.

SIZING

Sizing give body to fabric, improve hand and feel and impede soil and stain penetration.

Sizings are:

- starch,
- Synthetic polymers,
- or a combination of these.

Most starches are made from wheat, corn or rice. Practically all proprietary laundry starches also contain a small percentage of waxes, sulfonated oils, or other additives that aid starch penetration and increase the pliability of the finish.

WASH STEPS

Flushes

The word "flush" is used to describe a fairly quick, high-level bath prior to the break or the bleach bath. (The word "rinse" is usually reserved for high-level baths following the bleach bath).

Flushes generally are used to condition textiles before subsequent baths and to remove debris and loose soil.

Hospital work is sometimes given an opening flush or flushes at a low temperature-below 110 below F so as not to set blood and albuminous stains (blood, serum and many protein stains are set at temperatures above 110 degrees F).

Many operators also add some alkali to this initial flush to prevent setting of blood stains. This reasoning is valid only if the alkali is distributed throughout the load before blood stains are set; however, some alkali or surfactant in a low-temperature flush can be beneficial in removing blood stains.

Flushes also are used to:

- Raise washing temperatures from low to high,
- lower temperature from high to low,
- lower alkalinity prior to bleaching,
- lower the soil concentration, and more.

BREAK

The word "break" is used to describe the first wash-chemical bath. In light and medium soil formulas, all of the surfactant and alkali to be used in the entire formula generally is added to the washer in the break bath.

The break is the single most important step in laundering process from the standpoint of soil removal. It is a crucial checkpoint for chemical control.

BLEACH SUDS

The bleach bath suds bath is the last point at which detergency-promoting agents are added to the laundry formula.

In the past, this step had been referred to as the "bleach suds" because a light, running suds was the visual indicator that the pH was correct. But the advent of low-sudsing synthetic detergents and the practice of adding flushes between break and bleach to lower alkalinity have made pH testing a necessity to determine that the pH is correct for bleaching.

The key measurement of the bleach bath is pH, although titration values can also have meaning, especially when the chemical composition of the alkali is known. The pH of the bleach bath at 150

degrees F should fall within 10.2 to 10.8 for chlorine bleach. A pH below 10.2 results in accelerated bleach action, with its accompanying fabric damage, while a pH above 10.8 retards bleaching action, which lessens stain removal and causing trailing of unspent bleach into the subsequent bath.

Bleach pH values may be lower provided water temperatures are also lower.

RINSING

Rinsing is the term used for bath following the bleach and preceding the sour or finishing bath.

During rinsing the final portions of loosened soil are removed along with the bulk of the washing compounds used in laundering. The temperature of the load is gradually reduced to the point at which textiles can be removed from the washer. Rinses are always carried out at a high water level and usually with no additional chemicals except for antichlors.

The number of baths required to complete the washing cycle is determined by the amount of dilution needed to remove the soil and lower the alkalinity and chlorine content. Titration measurements help determine the proper number of rinses. The following paragraphs deal with the controllable factors in rinsing, which have a bearing on the minimum rinsing requirements.

TEMPERATURE

Rinsing lowers temperature as well as soil content, alkalinity, and chlorine content.

Usually the temperature of the wash load is between 130 and 150 degrees F when the bleach is dumped. The optimum temperature for handling a wash load with bare hands is in the range of 95 to 105 degrees F. This means rinsing reduces temperature by about 35 to 45 degrees if the load will be removed by hand (pulled). If the washroom has self-dumping equipment or washer/extractors, the linen can be dumped from the equipment at 130 to 140 degrees F.

NUMBER OF RINSE BATHS

The function of the rinse baths is to remove loosened soil (most of which has been eliminated prior to the bleach step) and the chemicals used in laundering (alkali, detergent, and bleach). All of the chemicals are highly soluble and are easily removed at a water temperature of from 110 to 140 degrees F.

DILUTION

Rinsing also accomplishes dilution, a key function in the overall washing process. The degree of dilution depends of the type of fabric being processed and whether high or low water levels are used. Cotton retains more water than polyester.

The cost of water has risen dramatically in recent years, as have the costs of softening, heating and disposing of it. For these reasons, less rinsing is done today than was thought necessary in the past years. A minimum of four rinses, two hot and two split, was the rule a generation ago. Today, three rinses or two rinses and an intermediate extraction are common.

Antichlors are added to rinses to help remove residual chlorine. They are generally added if there is danger that fabrics will retain available chlorine even though the rinse water sampled at the dump

shows no residual chlorine present. For example, certain resin finishes such as some permanent-press finishes are chlorine retentive. This is why antichlors usually are added if chlorine bleach is used in laundering resin finished garments.

SOUR BATH

Souring is normally the final step in the laundering process. The purpose of the sour or acid bath is to neutralize the alkalinity of the water in the textiles before finishing.

Souring is done at a lower water level, generally at the temperature desired for extracting and finishing the textiles. Higher souring temperatures improve extraction and reduce drying time. Souring time varies depending upon conditions.

In this bath, other finishing supplies such as fabric softeners, antibacterial agents, brighteners, even starch may be added along with the sour. Starch use generally requires lengthening the bath time.

EXTRACTION

Extraction is used to lower moisture.

The extraction process is most efficient at high temperature and if fiber lubricants such as fabric softeners have been added to the sour bath. In general, the warmer the fabric extracted, the better the moisture removal.

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CONVERSION TABLE

Multiply	By	To Obtain	Multiply	By	To Obtain
Absolute viscosity (poise)	1	Gram/second centimeter	Btu/Hr/ft ² /°F/ft	0.00413	Cal(gm)/Sec/cm ² °C/cm
Absolute viscosity (centipoise)	0.01	Poise		1.49	Cal (kg)Hr/M ² /°C /Meter
Acceleration due To gravity (g)	32.174	Feet/second ²	Btu/minute	12.96	Foot lbs/sec
	980.6	Centimeters/second ²		0.02356	Horsepower
Acres	0.4047	Hectares		0.01757	Kilowatts
	10	Square chains	Btu/minute	17.57	Watts
	43,560	Square feet	Btu/pound	0.556	Cal(Kg)/Kilogram
	4,047	Square meters	Bushels	2150.4	Cubic inches
	0.001562	Square miles		35.24	Liters
	4,840	Square yards		4	Pecks
	160	Square rods		32	Quarts (dry)
Acre-feet	43,560	ft ³	Cables	120	Fathoms
	325,851	Gallons (US)	Calories (gm)	0.003968	Btu
	1233.49	Cubic meters		0.001	Calories (Kg)
	1,233,490	Liters		3.088	Foot lbs
Acre-feet/hour	726	ft ³ /minute		1.558 x 10 ⁻⁶	Horsepower hrs.
	5430.86	Gallons/minute		4.185	Joules
Angstroms	10 ⁻¹⁰	Meters		0.4265	Kilogram meters
Acres	0.01	Hectares		1.1628 x 10 ⁻⁶	Kilowatt hours
	1076.39	Square feet		0.0011628	Watt hours
	0.02471	Acres	Cal/(gm)sec/cm ²		
Atmospheres	76.0	Cms of Hg at 32°F	°C/cm	242.13	Btu/Hr/ft ² /°F/ft
	29.921	Inches of Hg at 32°F	Calories (Kg)	3.968	Btu
	33.94	Feet of water at 62°F		1000	Calories (gm)
	10.333	Kgs square meter		3088	Foot lbs
	14.6963	lbs/square inch		0.001558	Horsepower hrs.
	1.058	Tons/square foot		4185	Joules
	1013.15	Millibars		426.5	Kilogram meters
	235.1408	Ounces/square inch		0.0011628	Kilowatt hours
Bags of cement	94	lbs of cement		1.1628	Watt hours
Barrels of oil	42	Gallons of oil	Calories(Kg)/		
Barrels of cement	376	lbs of cement	Cu meter	0.1124	Btu/Cu foot at
Barrels (not legal)	31	Gallons (US)			0°C
or	31.5	Gallons (US)	Cal(kg)Hr/M ²		
Board feet	144 x 1 in.	Cubic inches	°C/M	0.671	Btu/Hr/ft ² /°F/ft
Boiler horsepower	33,479	Btu/hour	Calories (Kg)/Kg	1.8	Btu/pound
	9,803	Kilowatts	Calories (Kg)/min	51.43	Foot lbs/sec
	34.5	lbs of water evaporated/hour at 212°F		0.09351	Horsepower
				0.06972	Kilowatts
Btu	252.016	Calories (gm)	Carats (diamond)	200	Milligram
	0.252	Calories (Kg)	Centares (Centiares)	1	Square meters
	777.54	Foot lbs	Centigram	0.01	Grams
	0.0003927	Horsepower hours	Centiliters	0.01	Liters
	1054.2	Joules	Centimeters	0.3937	Inches
	107.5	Kilogram meters		0.032808	Feet
	0.0002928	Kilowatt hours		0.01	Meters
Btu/Cu foot	8.89	Calories(kg)/Cu meter at 32°F		10	Millimeters
*For thickness less than 1 in. use actual thickness in decimals of an inch.					

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Centimeter of Hg			ft ³ /minute		
At 32°F	0.01316	Atmospheres		472	Cubic centimeters/sec.
	0.4461	Feet of water at 62°F		0.1247	Gallons (US) sec.
	136	Kgs./square meter		0.472	Liters/second
	27.85	lbs/Square foot		62.36	lbs water
	0.1934	lbs/Square inch			Min at 62°F
Centimeters/sec	1.969	Feet/minute		7.4805	Gallons (US)/min
	0.03281	Feet/second		10.772	Gallons/24 hrs.
	0.036	Kilometers/hour		0.033058	Acre feet/24 hrs
	0.6	Meters/hour	ft ³ /second	646,317	Gallons (US)/24 hrs.
	0.02237	Miles/hour		448,831	Gallons/minute
	0.0003728	Miles/minute		1.98347	Acre feet/24 hrs.
Centimeters/Second ²			Cubic inches	16.387	Cubic centimeters
Centipoise	0.03281	Feet/second ²		0.0005787	ft ³
	0.000672	lbs/sec foot		1.639 x 10 ⁻⁵	Cubic meters
	2.42	lbs/hour foot		2.143 x 10 ⁻⁵	Cubic yards
	0.01	Poise		0.004329	Gallons (US)
Chains (Gunter's)	4	Rods		0.01639	Liters
	66	Feet		0.03463	Pints (liq. US)
	100	Links		0.01732	Quarts (liq. US)
Cheval-Vapeur	1	Metric horsepower	Cubic meters	10 ⁶	Cubic centimeters
	75	Kilogram meters/second		35.31	ft ³
	0.98632	Horsepower		61,023	Cubic inches
Circular inches	10 ⁶	Circular mils		1,308	Cubic yards
	0.7854	Square inches		264.2	Gallons (US)
	785,400	Square mils		1000	Liters
Circular mils	0.7854	Square mils		2113	Pints (liq. US)
	10 ⁻⁶	Circular inches		1057	Quarts (liq. US)
	7.854 x 10 ⁻⁵	Square inches	Cubic yards	764,600	Cubic centimeters
				27	ft ³
Cubic centimeters	3.531 x 10 ⁻⁵	ft ³		46,656	Cubic inches
	0.06102	Cubic inches		0.7646	Cubic meters
	10 ⁻⁶	Cubic meters		202	Gallons (US)
	1.308 x 10 ⁶	Cubic yards		764.6	Liters
	0.0002642	Gallons		1616	Pints (liq. US)
	0.001	Liters		807.9	Quarts (liq US)
	0.002113	Pints (liq. US)	Cubic yards/minute	0.45	ft ³ /sec
	0.001057	Quarts (liq. US)		3.367	Gallons (US)/sec
	0.0391	Ounces (fluid)		12.74	Liters/second
ft ³	28,320	Cubic centimeters	Cubit	18	Inches
	1728	Cubic inches	Days (mean)	1440	Minutes
	0.02832	Cubic meters		24	Hours
	0.03704	Cubic yards		86,400	Seconds
	7.48052	Gallons (US)	Days (sidereal)	86,164.1	Solar seconds
	28.32	Liters	Decigrams	0.1	Grams
	59.84	Pints (liq. US)	Deciliter	0.1	Liters
	29.92	Quarts (liq. US)	Decimeters	0.1	Meters
	2.296 x 10 ⁻⁵	Acre feet	Degrees (angle)	60	Minutes
	0.803564	Bushels		0.01745	Radians
	62.4266	lbs at 39.2° F		3600	Seconds
ft ³ of water	62.3554	lbs at 62° F			

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Degrees F (less 32)	0.5556	Degrees C	Feet/second	0.6818	Miles/hour
Degrees F	1 (plus 460)	Degrees F above absolute 0	Feet/second ²	0.01136	Miles/minute
Degrees C	1.8 (plus 32)	Degrees F		30.48	Centimeters/sec ²
	1 (plus 273)	Degrees C above absolute 0	Flat of a hexagon	0.3048	Meters/second ²
Degrees/second	0.01745	Radians/second	Flat of a square	1.155	Distance across corners
	0.1667	Revolutions/min		1.414	Distance across corners
	0.002778	Revolutions/sec	Foot lbs	0.0012861	Btu
Dekagrams	10	Grams		0.32412	Calories (gm)
Dekaliters	10	Liters		0.0003241	Calories (Kg)
Dekameters	10	Meters		5.05x 10 ⁻⁷	Horsepower hrs
Diameter (circle)	3.14159265359	Circumference		1.3558	Joules
(Approx.)	3.1416			0.13826	Kilogram meters
(Approx.)	3.14			3.766 x 10 ⁻⁷	Kilowatt hours
(Approx.)	22/7			0.0003766	Watt hours
Diameter (circle)	0.88623	Side of equal sq.	Foot lbs/min	0.001286	Btu/minute
	0.7071	Side of inscribed Square		0.01667	Foot lbs/sec.
				3.03 x 10 ⁻⁵	Horsepower
Diameter ³ (sphere)	0.5236	Volume (sphere)		0.0003241	Calories (Kg)/min
Diameter (Major) X				2.26 x 10 ⁻⁵	Kilowatts
Diam. (Minor)	0.7854	Area of ellipse	Foot/lbs/sec	0.07717	Btu/minute
Diameter ² (circle)	0.7854	Area (circle)		0.001818	Horsepower
Diameter ² (sphere)	3.1416	Surface (sphere)		0.01945	Calories (kg)/min
Diam (inches) XRPM	0.262	Belt speed ft/min		0.001356	Kilowatts
Digits	0.75	Inches	Furlong	40	Rods
Drams (avoirdupois)	27.34375	Grains		220	Yards
	0.0625	Ounces (avoir)		660	Feet
	1.771845	Grams		0.125	Miles
Fathoms	6	Feet		0.2042	Kilometers
Feet	30.48	Centimeters	Gallons (imperial)	277.42	Cubic inches
	12	Inches		4.543	Liters
	0.3048	Meters		1.20095	Gallons (US)
	1/3	Yards	Gallons (US)	3785	Cubic centimeters
	0.06061	Rods		0.13368	ft ³
Feet of water at 62	0.029465	Atmospheres		231	Cubic inches
	0.88162	Inches of Hg at 32° F		0.003785	cubic meters
				0.004951	Cubic yards
	62.3554	lbs/sq. ft		3.785	Liters
	0.43302	lbs/sq. ft		8	Pints (liq. US)
	304.44	Kilogram sq. meter		4	Quarts (liq. US)
Feet/minute	0.5080	Centimeter/sec.		0.83267	Gallon (imperial)
	0.1667	Feet/second		3.069 x 10 ⁻⁶	Acre feet
	0.01829	Kilometer/hour	Gallons (US) of Water at 62°F	8.3357	lbs of water
	0.3048	Meters/minute		6.0086	Tons of water/24 hours
	0.01136	Miles/hour	Gallons (US) of water/minute		
Feet/second	30.48	Centimeter/sec			
	1.097	Kilometer/hours			
	0.5921	Knots			
	18.29	Meters/minute			

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Gallons (US)/minute	0.002228	ft ³ /second	Horsepower (boiler)	33,479	Btu/hour
	0.13368	ft ³ /minute		9.803	Kilowatts
	8.0208	ft ³ /hour		34.5	lbs of water
	0.06309	Liters/second			Evaporated/hour at
	3.78533	Liters/minute			212°F
	0.0044192	Acre feet/24 hours	Horsepower hours	2546.5	Btu
Grains	1	Grains (avoirdupois)		641,700	Calories (gm)
	1	Grains (apothecary)		641.7	Calories (Kg)
	1	Grains (troy)		1,980,000	Foot lbs
	0.0648	Grams		2,684,500	Joules
	0.0020833	Ounces (troy)		273,740	Kilogram meters
	0.0022857	Ounces (avoir)		0.7455	Kilowatt hours
Grains/gallon (US)	17.118	Parts/million		745.5	Watt hours
	142.86	lbs/million	Inches	2.54	Centimeters
		Gallons (US)		0.8333	Feet
Grains	980.7	Dynes		1000	Mils
	15.43	Grains		12	Lines
	0.001	Kilograms		72	Points
	1000	Milligrams	Inches of Hg at		
	0.03527	Ounces (avoir)	32° F	0.03342	Atmospheres
	0.3215	Ounces (troy)		345.3	Kilograms/sq. meters
Grams/centimeter	0.002205	lbs		70.73	lbs/square foot
Grams/cubic	0.0056	lbs/inch		0.49117	lbs/square inch
centimeter	62.43	lbs/ft ³		1.1343	Feet of water 62°F
	0.03613	lbs/cubic inch		13.6114	Inches of water at
	4.37	Grains/100 cubic ft			62°F
Grams/liter	58.417	Grains/gallon (US)		7.85872	Ounces/square inch
	8.345	lbs/100 *	Inches of water at		
		Gallons (US)	62°F	0.002455	Atmospheres
	0.062427	lbs/cubic foot		25.37	Kilograms/sq meter
	1000	Parts/million		0.5771	Ounces/square inch
Gravity (g)	32.174	Feet/second ²		5.1963	lbs/square foot
	980.6	Centimeter/sec ²		0.03609	lbs square inch
Hand	4	Inches		0.07347	Inches at Hg at 32°F
	10.16	Centimeters	Joules	0.00094869	Btu
Hectares	2.471	Acres		0.239	Calories (gm)
	107.639	Square feet		0.000239	Calories (Kg)
	100	Acres		0.73756	Foot lbs
Hectograms	100	Grams		⁻⁷	Horsepower hours
				3.72 x 10	
Hectoliters	100	Liters		0.10197	Kilogram meters
Hectometers	100	Meters		⁻⁷	Kilowatt hours
				2.778 x 10	
Hectowatts	100	Watts		0.0002778	Watt hours
Hogshead	63	Gallons (US)		1	Watt second
	238.4759	Liters	Kilograms	980,665	Dynes
Horsepower	42.44	Btu/minute		2.205	lbs
	33,000	Foot/lbs/min		0.001102	Tons (short)
	550	Foot lbs/sec		1000	Grams
	1.014	Metric horsepower		35.274	Ounces (avoir.)
		(Cheval vapeur)		32.1507	Ounces (troy)
	10.7	Calories (Kg)/min			
	0.7457	Kilowatts			
	745.7	Watts			

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Kilogram meters	0.009302	Btu	Knots	1	Nautical miles/hr
	2.344	Calories (gm)		1.1516	Miles/hour
	0.002344	Calories (kg)		1.8532	Kilometers/hour
	7.233	Foot lbs	Leagues	3	Miles
	⁻⁶ 3.653 x 10	Horsepower hours	Lines	0.8333	Inches
	9.806	Joules	Links	7.92	Inches
	⁻⁶ 2.724 x 10	Kilowatt hours	Liters	1000	Cubic centimeters
	0.002724	Watt hours		0.03531	ft ³
Kilograms/				61.02	Cubic inches
Cubic meter	0.06243	lbs/cubic foot		0.001	Cubic meters
Kilograms/meter	0.6720	lbs/foot		0.001308	Cubic yards
Kilograms/square				0.2642	Gallons (US)
Centimeter	14.223	lbs/sq. inch		0.22	Gallons (Imp)
	1	Metric atmospheres		2.113	Pints (liq.US)
Kilogram/sq. meter	⁻⁵ 9.678 x 10	Atmospheres		1.057	Quarts (liq. US)
	0.003285	Feet of water at		⁻⁷ 8.107 x 10	Acre feet
		62°F		2.2018	lbs of water at 62°F
	0.002896	Inches at Hg at	Liters/minute	0.0005886	ft ³ /second
		32°F		0.004403	Gallons (US)/second
	0.2048	lbs/sq. foot		0.26418	Gallons (US)/minute
	0.001422	lbs/sq. inch	Meters	100	Centimeters
	0.007356	Centimeter at Hg		3.281	Feet
		At 32°F		39.37	Inches
Kiloliters	1000	Liters		1.094	Yards
Kilometers	100,000	Centimeters		0.001	Kilometers
	1000	Meters		1000	Millimeters
	3281	Feet	Meters/minute	1.667	Centimeters/second
	0.6214	Miles		3.281	Feet/minute
	1094	Yards		0.05468	Feet/second
Kilometers/hour	27.78	Centimeter/sec		0.06	Kilometers/hour
	54.68	Feet/minute		0.03728	Miles/hour
	0.9113	Feet/second	Meters/second	196.8	Feet/minute
	16.67	Meters minute		3.281	Feet/second
	0.6214	Miles/hour		3.6	Kilometers/hour
	0.5396	Knots		0.06	Kilometers/minute
Kilometers/hr/sec	27.78	Centimeters/sec/sec		2.237	Miles/hour
	0.9113	Feet/sec/sec		0.03728	Miles/minute
	0.2778	Meters/sec/sec	Micron	⁻⁶ 10	Meter
Kilowatts	56.92	Btu minute		0.001	Millimeters
	44.250	Foot lbs/min		0.03937	Mils
	737.6	Foot lbs/sec	Mils	0.001	Inches
	1.341	Horsepower		0.0254	Millimeters
	14.34	Calories (Kg)/min		25.4	Microns
	1000	Watts	Miles	160,934	Centimeters
Kilowatt hours	3413	Btu		5280	Feet
	860,500	Calories (gm)		63,360	Inches
	860.5	Calories (Kg)		1,609	Kilometers
	2,655,200	Food lbs		1760	Yards
	1341	Horsepower hours		80	Chains
	3,600,000	Joules		320	Rods
	367,100	Kilogram meters		0.8684	Nautical miles
	1000	Watt hours			

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Miles/hour	44.70	Centimeters/second	Pennyweights (troy)	24	Grains
	88	Feet/minute		1.55517	Grams
	1.467	Feet/second		0.05	Ounces (troy)
	1.609	Kilometers/hour		0.0041667	lbs (troy)
	0.8684	Knots	Pints (liq US)	4	Gills
	26.82	Meters/minute		16	Ounces (fluid)
Miles/minute	2682	Centimeters/sec		0.5	Quarts (liq. US)
	88	Feet/second		28.875	Cubic inches
	1.609	Kilometers/minute		473.1	Cubic centimeters
	60	Miles/hour	Pipe	126	Gallons (US)
Millibars	0.000987	Atmosphere	Points	0.01389	Inches
Milliers	1000	Kilograms	Poise	0.0672	lbs/sec foot
Milligrams	0.001	Grams		242	lbs/hour foot
	0.01543	Grains		100	Centipoise
Milligrams/liter	1	Parts/million	Poncelots	100	Kilogram meters/sec
Milliliters	0.001	Liters		1.315	Horsepower
Million/gals/24 hrs.	1.54723	ft ³ /second	lbs (avoirdupois)	16	Ounces (avoir)
Millimeters	0.1	Centimeters		256	Drams (avoir)
	0.03937	Inches		7000	Grains
	39.37	Mils		0.0005	Tons (short)
	1000	Microns		453.5924	Grams
Miner's inches	1.5	ft ³ /minute		1.21528	lbs (troy)
Minutes (angle)	0.0002909	Radians		14.5833	Ounces (troy)
Nautical miles	6080.2	Feet	lbs (troy)	5760	Grains
	1.1516	Miles		240	Pennyweights (troy)
Ounces (avoirdupois)	16	Drams (avoir)		12	Ounces (troy)
	437.5	Grains		373.24177	Grams
	0.0625	lbs (avoir)		0.822857	lbs (avoir)
	28.349527	Grams		13.1657	Ounces (avoir)
	0.9115	Ounces (troy)		0.00036735	Tons (long)
Ounces (fluid)	1.805	Cubic inches		0.00041143	Tons (short)
	0.02957	Liters	lbs of water at	0.00037324	Tons (metric)
	29.57	Cubic centimeters	62°F		
	0.25	Gills		0.010604	ft ³
Ounces (troy)	480	Grains		27.72	Cubic inches
	20	Pennyweights (troy)		0.120	Gallons (US)
	0.08333	lbs (troy)	lbs of water/		
	31.103481	Grams	Min at 62°F	0.0002673	ft ³ /second
	1.09714	Ounces (avoir)	lbs/cubic inch	0.01602	Grams/cubic
Ounces/square inch	0.0625	lbs/square in			Centimeter
	1.732	Inches of water at		16.02	Kilograms/cubic
		62°F			Meter
	4.39	Centimeters of		0.0005787	lbs/cubic inch
		Water at 62°F		27.68	Grams/cubic
	0.12725	Inches of Hg at			Centimeter
		32°F		27,680	Kilograms/cubic
	0.004253	Atmospheres			Meter
Palms	3	Inches		1728	lbs/cubic foot
Parts/million	0.0584	Grains/gallons (US)	lbs/foot	1.488	Kilograms/meter
	0.07016	Grains/gallons (Imp)	lbs/inch	178.6	Grams/centimeter
	8.345	lbs/million	lbs/hour foot	0.4132	Centipoise
		Gal (US)		0.004132	Poise grams/sec cm

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
lbs/sec foot	14.881	Poise grams/sec cm	Revolutions/second	360	Degrees/second
lbs/square foot	1488.1	Centipoise		6.283	Radians/second
	0.016037	Feet of water at 62°F		60	Revolutions/minute
			Revolutions/second ²	6.283	Radians/second ²
	4.882	Kilograms/sq meter		3600	Revolutions/min ²
	0.006944	lbs/square in	Rods	16.5	Feet
	0.014139	Inches of Hg at 32°F		5.5	Yards
			Seconds (angle)	4.848 x 10 ⁻⁶	Radians
	0.004725	Atmospheres	Sections	1	Square miles
lbs/square inch	0.068044	Atmospheres	Side of a square	1.4142	Diameter of inscribed circle
	2.390934	Feet of water at 62°F		1.1284	Diameter of circle With equal area
	2.0360	Inches of Hg at 32°F			
	703.067	Kilograms/sq. meter	Span	9	Inches
	27.912	Inches of water at 62°F	Square centimeters	0.001076	Square feet
				0.1550	Square inches
Quadrants (angular)	90	Degrees		.001	Square meters
	5400	Minutes		100	Square millimeter
	324,000	Seconds	Square feet	2.296 x 10 ⁻⁵	Acres
	1.751	Radians		929.0	Square centimeters
Quarts (dry)	67.20	Cubic inches		144	Square inches
Quarts (liq. US)	2	Pints (liq. US)		0.0929	Square meters
	0.9463	Liters		3.587 x 10 ⁻⁵	Square miles
	32	Ounces (fluid)		0.1111	Square yards
	57.75	Cubic inches		6.452	Square centimeters
	946.3	Cubic centimeters		0.006944	Square feet
Quintal, Argentine	101.28	lbs	Square inches	645.2	Square millimeters
Brazil	129.54	lbs		1.27324	Circular inches
Castile, Peru	101.43	lbs		1,273,239	Circular mils
Chile	101.41	lbs		1,000,000	Square mils
Metric	220.46	lbs	Square kilometers	247.1	Acres
Mexico	101.47	lbs		10,760,000	Square feet
Qures	25	Sheets		1,000,000	Square meters
Radians	57.30	Degrees		0.3861	Square miles
	3438	Minutes		1,196,000	Square yards
	206,625	Seconds	Square meters	0.0002471	Acres
	0.637	Quadrants		10.764	Square feet
Radians/second	57.30	Degrees/second		1.196	Square yards
	0.1592	Revolutions/second		1	Centares
	9.549	Revolutions/minute	Square miles	640	Acres
Radians/second ²	573.0	Revolutions/min ²		27,848,400	Square feet
	0.1592	Revolutions/sec ²		2,590	Square kilometers
Reams	500	Sheets		259	Hectares
Revolutions	360	Degrees		3,097,600	Square yards
	4	Quadrants		102,400	Square rods
	6.283	Radians		1	Sections
Revolutions/minute	6	Degrees/second	Square millimeters	0.01	Square centimeters
	0.1047	Radians/second		0.00155	Square inches
	0.01667	Revolutions/second		1550	Square mils
Revolutions/minute ²	0.001745	Radians/second ²		1973	Circular mils
	0.0002778	Revolutions/sec ²	Square mils	1.27324	Circular mils
				0.0006452	Square millimeters
				10 ⁻⁶	Square inches

Conversion Table

Multiply	By	To Obtain	Multiply	By	To Obtain
Square yards	0.0002066	Acres			
	9	Square feet			
	0.8361	Square meters			
	$\frac{1}{3.228 \times 10^7}$	Square miles			
Stere	1	Cubic meters			
Stone	14	lbs			
	6.35029	Kilograms			
Tons (long)	1016	Kilograms			
	2240	lbs			
	1.12	Tons (short)			
Tons metric	1000	Kilograms			
	2205	lbs			
	1.1023	Tons (short)			
Tons (short)	2000	lbs			
	32,000	Ounces			
	907.185	Kilograms			
	0.90718	Tons (metric)			
	0.89286	Tons (long)			
Ton of refrigeration	12,000	Btu/hour			
	288,000	Btu/24 hours			
Tons of water/24 Hours at 62°F	83.33	lbs of water/hr			
	0.16510	Gallons (US)/minute			
	1.3263	ft ³ /hour			
Watts	0.05692	Btu/minute			
	44.26	Foot lbs/min			
	0.7376	Foot lbs/sec			
	0.001341	Horsepower			
	0.01434	Calories (kg)/min			
	0.001	Kilowatts			
	1	Joule/second			
Watt hours	3.413	Btu			
	860.5	Calories (gm)			
	0.8605	Calories (Kg)			
	2655	Foot lbs			
	0.001341	Horsepower hours			
	3600	Joules			
	367.1	Kilograms meters			
	0.001	Kilowatt hours			
Watts/square inch	8.2	Btu/square foot/ Minutes			
	6373	Foot lbs/ Square ft/min			
	0.1931	Horsepower/sq. ft			
Yards	91.44	Centimeters			
	3	Feet			
	36	Inches			
	0.9144	Meters			
	0.1818	Rods			
Year (365 days)	8760	hours			

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30015 T5E, T5X, T6X, V7J, V8Z, VRJ DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 30015 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	14	55	6	24	8	32
Following Intermediate Extract	10	38	5	20	6	21

The 30015 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		4	16	4	15	4	15
3	8		5	18	5	17	4	17
4	10		6	21	5	19	5	19
5	13		6	24	6	21	5	21
6	15		7	27	6	23	6	22
7	18		8	30	7	26	6	24
8	20	LOW	9	33	7	28	7	26
9	23		10	37	8	30	8	28
10	25	HIGH	11	40	9	32	8	30
11	28		11	43	9	35	9	32
12	30		12	47	10	37	9	34
13	33		14	54	11	43	11	41
14	36		17	63	14	53	13	50
15	38		19	72	16	62	16	59
16	41		22	82	19	71	18	69
17	43		24	91	21	81	21	78
18	46		26	100	24	90	23	87
19	48		29	109	26	99	26	96
20	51		31	118	29	108	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				14	0			
none	High	10	0	10	COLD	0	11	5.21	25	95
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	9	4.85	9	34
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	11	5.21	11	40
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	9	4.85	9	34
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	11	5.21	11	40
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	11	5.21	11	40
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	11	5.21	11	40
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	10	0		10	38
Rinse	High	10		10	NONE	0	11	5.21	11	40
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	10	0		10	38

30022H8J, T5E, VRJ, T5X, T6X, V6J, V8Z, X8J, X8R, X8W DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 30022 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Intitial	22	82	10	36	13	48
Following Intermediate Extract	15	57	8	30	8	32

The 30022 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		5	20	5	18	5	18
3	8		6	24	6	22	6	21
4	10		7	28	7	25	6	24
5	13		8	32	7	28	7	27
6	15		10	36	8	31	8	29
7	18		11	41	9	34	9	32
8	20	LOW	12	46	10	37	9	35
9	23		13	50	11	41	10	38
10	25	HIGH	15	55	12	44	11	41
11	28		16	60	13	47	12	44
12	30		17	65	13	51	12	47
13	33		19	73	15	58	14	54
14	36		23	87	19	72	18	68
15	38		27	101	23	85	22	81
16	41		30	114	26	99	25	95
17	43		34	128	30	113	29	109
18	46		37	142	33	126	32	122
19	48		41	155	37	140	36	136
20	51		44	168	40	153	39	150

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				22	0			
none	High	10	0	10	COLD	0	13	4.87	35	133
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	11	4.55	11	42
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	13	4.87	13	51
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	11	4.55	11	42
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	13	4.87	13	51
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	13	4.87	13	51
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	13	4.87	13	51
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	15	0		15	57
Rinse	High	10		10	NONE	0	13	4.87	13	51
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	15	0		15	57
none	None	0		0	NONE	0	0		0	0

36021V5J, V5Z, V7J, V7Z DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 36021 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	29	109	13	48	17	64
Following Intermediate Extract	20	76	10	40	11	43

The 36021 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		7	26	7	25	7	25
3	8		8	30	7	28	7	27
4	10		9	33	8	30	8	29
5	13		10	37	9	33	8	32
6	15		11	41	9	36	9	34
7	18		12	45	10	38	10	36
8	20	LOW	13	50	11	41	10	39
9	23		14	54	12	44	11	41
10	25		15	58	12	47	11	43
11	28		17	63	13	49	12	46
12	30		18	68	14	52	13	48
13	33	HIGH	19	72	15	55	13	51
14	36		20	77	15	58	14	53
15	38		22	83	17	63	15	58
16	41		26	98	21	78	19	72
17	43		30	113	24	92	23	87
18	46		34	127	28	107	27	101
19	48		38	142	32	122	31	116
20	51		41	157	36	136	33	125

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				29	0			
none	High	13	0	13	COLD	0	19	4.99	48	181
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	13	4.37	13	50
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	19	4.99	19	72
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	13	4.37	13	50
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	19	4.99	19	72
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	19	4.99	19	72
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	19	4.99	19	72
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	76
Rinse	High	13		13	NONE	0	19	4.99	19	72
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	76
none	None	0		0	NONE	0	0		0	0

36026V7J, V5J, V5Z, V7Z, X8J, X8R, X8W DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 30026 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	36	137	16	61	21	80
Following Intermediate Extract	25	95	13	50	14	53

The 30026 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		8	28	7	27	7	27
3	8		9	33	8	30	8	29
4	10		10	37	9	33	8	32
5	13		11	41	10	36	9	35
6	15		12	46	10	39	10	37
7	18		13	51	11	42	11	40
8	20	LOW	15	56	12	45	11	42
9	23		16	61	13	48	12	45
10	25		17	66	14	51	13	47
11	28		19	71	14	55	13	50
12	30		20	77	15	58	14	53
13	33	HIGH	22	82	16	61	15	55
14	36		23	88	17	64	15	58
15	38		25	94	18	69	16	62
16	41		30	112	23	86	21	79
17	43		34	129	27	104	26	97
18	46		39	147	32	122	30	115
19	48		44	165	37	140	35	133
20	51		48	183	42	157	40	151

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				36	0			
none	High	13	0	13	COLD	0	22	4.81	58	218
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	15	4.23	15	56
Drain	None	0			NONE	0	0		0	0
none	High	13	0	13	HOT	0	22	4.81	22	82
none	None	0			NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	15	4.23	15	56
none	None	0			NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	22	4.81	22	82
none	None	0			NONE	0	0		0	0
none	None	0			NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	22	4.81	22	82
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	22	4.81	22	82
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0			NONE	0	0		0	0
none	None	0			NONE	0	0		0	0
Intermediate extract	None	0			NONE	0	0		0	0
none	None	0			NONE	25	0		25	95
Rinse	High	13			NONE	0	22	4.81	22	82
none	None	0			NONE	0	0		0	0
Intermediate extract	None	0			NONE	0	0		0	0
none	None	0			NONE	25	0		25	95
none	None	0			NONE	0	0		0	0

36030F8R and S DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 36030 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	40	150	18	67	23	88
Following Intermediate Extract	28	105	14	55	15	59

The 36030 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		8	30	8	29	7	28
3	8		9	35	8	32	8	31
4	10		11	40	9	35	9	34
5	13		12	45	10	39	10	37
6	15		13	50	11	42	11	40
7	18		15	56	12	45	11	43
8	20	LOW	16	61	13	49	12	45
9	23		18	67	14	52	13	48
10	25		19	73	15	56	13	51
11	28		21	78	16	59	14	54
12	30		22	84	17	63	15	57
13	33	HIGH	24	90	17	66	16	60
14	36		26	97	18	70	17	62
15	38		29	111	22	83	20	76
16	41		35	131	27	103	25	96
17	43		40	151	33	124	31	116
18	46		45	172	38	144	36	136
19	48		51	192	43	164	41	157
20	51		56	212	49	184	43	164

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				40	0			
none	High	13	0	13	COLD	0	24	4.81	63	240
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	16	4.23	16	61
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	24	4.81	24	91
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	16	4.23	16	61
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	24	4.81	24	91
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	24	4.81	24	91
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	24	4.81	24	91
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	28	0		28	104
Rinse	High	13		13	NONE	0	24	4.81	24	91
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	28	0		28	104
none	None	0		0	NONE	0	0		0	0

42026V6J, V6Z, X7J, X7R, X7W DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 42026 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	50	191	22	85	29	112
Following Intermediate Extract	35	133	18	70	20	75

The 42026 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		12	45	12	44	11	43
3	8		14	53	13	50	13	49
4	10		16	60	15	56	15	55
5	13		18	69	17	63	16	61
6	15		20	77	18	69	18	67
7	18		23	86	20	76	19	73
8	20		25	95	22	83	21	80
9	23		27	104	24	90	23	86
10	25	LOW	30	113	26	97	25	93
11	28		33	123	28	105	26	100
12	30		35	133	30	112	28	107
13	33	HIGH	38	143	32	120	30	113
14	36		41	153	34	127	32	120
15	38		43	163	36	135	34	128
16	41		46	174	38	143	36	135
17	43		49	184	40	151	38	142
18	46		52	195	42	159	39	149
19	48		54	206	44	167	41	156
20	51		57	216	46	175	43	163

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				29	0			
none	High	13	0	13	COLD	0	32	3.64	61	231
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	26	3.28	26	97
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	32	3.64	32	120
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	26	3.28	26	97
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	32	3.64	32	120
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	32	3.64	32	120
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	32	3.64	32	120
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	74
Rinse	High	13		13	NONE	0	32	3.64	32	120
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	74
none	None	0		0	NONE	0	0		0	0

42030V6J, V6Z DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 42030 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	58	219	26	97	34	128
Following Intermediate Extract	40	152	21	79	22	85

The 42030 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		13	48	12	46	12	46
3	8		15	56	14	53	14	52
4	10		17	64	16	59	15	58
5	13		19	73	17	66	17	64
6	15		22	82	19	73	19	71
7	18		24	91	21	80	20	77
8	20		27	101	23	87	22	84
9	23		29	111	25	95	24	90
10	25	LOW	32	121	27	102	26	97
11	28		35	131	29	110	28	104
12	30		38	142	31	118	29	111
13	33	HIGH	40	153	33	126	31	119
14	36		43	164	35	134	33	126
15	38		46	175	38	142	35	133
16	41		49	186	40	150	37	140
17	43		52	197	42	158	39	148
18	46		55	208	44	166	41	155
19	48		58	220	46	175	43	163
20	51		62	233	49	186	43	163

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				34	0			
none	High	13	0	13	COLD	0	33	3.48	67	253
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	27	3.16	27	102
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	33	3.48	33	126
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	27	3.16	27	102
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	33	3.48	33	126
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	33	3.48	33	126
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	33	3.48	33	126
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	22	0		22	85
Rinse	High	13		13	NONE	0	33	3.48	33	126
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	22	0		22	85
none	None	0		0	NONE	0	0		0	0

42032F7S and R, X7J, X7W, X7R DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 42032 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	61	232	27	103	36	136
Following Intermediate Extract	43	162	22	84	24	91

The 42032 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		13	49	12	47	12	47
3	8		15	57	14	54	14	53
4	10		17	66	16	61	16	59
5	13		20	75	18	68	17	66
6	15		22	84	20	75	19	72
7	18		25	94	22	82	21	79
8	20		28	104	24	90	23	86
9	23		30	114	26	97	24	93
10	25	LOW	33	125	28	105	26	100
11	28		36	135	30	113	28	107
12	30		39	146	32	121	30	114
13	33	HIGH	42	157	34	129	32	121
14	36		45	169	36	137	34	128
15	38		48	180	38	145	36	136
16	41		51	192	41	154	38	143
17	43		54	203	43	162	40	151
18	46		57	215	45	170	42	158
19	48		60	227	47	179	44	166
20	51		64	242	51	191	48	181

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				36	0			
none	High	13	0	13	COLD	0	34	3.42	70	264
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	28	3.11	28	105
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	28	3.11	28	105
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	34	3.42	34	129
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	34	3.42	34	129
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	24	0		24	90
Rinse	High	13		13	NONE	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	24	0		24	90
none	None	0		0	NONE	0	0		0	0

42044WP2, STAPH GUARD DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 42044 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
When	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	79	301	35	133	46	175
Following Intermediate Extract	55	210	29	109	31	117

The 42044 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		15	56	14	54	14	53
3	8		18	66	16	62	16	60
4	10		20	77	18	70	18	68
5	13		23	88	21	78	20	75
6	15		26	99	23	86	22	82
7	18	LOW	29	111	25	94	24	90
8	20		32	123	27	103	26	97
9	23		36	135	29	111	28	105
10	25		39	147	32	120	30	113
11	28		42	160	34	129	32	121
12	30	HIGH	46	173	36	138	34	129
13	33		49	186	39	147	36	137
14	36		53	200	41	156	38	145
15	38		56	213	44	165	40	153
16	41		60	227	46	175	43	161
17	43		64	241	49	184	45	169
18	46		67	255	51	193	47	177
19	48		72	271	54	206	50	188
20	51		82	309	64	244	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				46	0			
none	High	12	0	12	COLD	0	36	3.13	83	313
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	7	0	7	HOT	0	25	2.70	25	94
Drain	None	0		0	NONE	0	0		0	0
none	High	12	0	12	HOT	0	36	3.13	36	138
none	None	0		0	NONE	0	0		0	0
Suds	Low	7	0	7	HOT	0	25	2.70	25	94
none	None	0		0	NONE	0	0		0	0
Flush	High	12	0	12	HOT	0	36	3.13	36	138
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	12	0	12	HOT/COLD SPLIT	0	36	3.13	36	138
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	12	0	12	COLD	0	36	3.13	36	138
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	31	0		31	117
Rinse	High	12		12	NONE	0	36	3.13	36	138
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	31	0		31	117
none	None	0		0	NONE	0	0		0	0

48040F7B, F7N, F7J, F7W, H7N, H7W, F72, F7D, H7R, H7K DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 48040 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	99	376	44	167	58	219
Following Intermediate Extract	69	262	36	137	39	147

The 48040 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		20	74	19	72	19	71
3	8		23	86	22	81	21	80
4	10		26	98	24	91	24	89
5	13		29	110	27	100	26	98
6	15		32	123	29	110	28	106
7	18	LOW	36	136	32	120	30	115
8	20		39	149	34	129	33	124
9	23		43	162	37	139	35	133
10	25		47	176	39	149	38	142
11	28		50	190	42	159	40	151
12	30	HIGH	54	204	45	170	42	160
13	33		58	219	48	180	45	169
14	36		62	233	50	190	47	179
15	38		66	248	53	201	50	188
16	41		70	263	56	211	52	198
17	43		74	278	59	222	55	207
18	46		78	294	62	233	57	216
19	48		82	309	64	243	60	226
20	51		86	324	67	254	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				58	0			
none	High	14	0	14	COLD	0	50	3.28	108	409
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	9	0	9	HOT	0	37	2.87	37	139
Drain	None	0		0	NONE	0	0		0	0
none	High	14	0	14	HOT	0	50	3.28	50	191
none	None	0		0	NONE	0	0		0	0
Suds	Low	9	0	9	HOT	0	37	2.87	37	139
none	None	0		0	NONE	0	0		0	0
Flush	High	14	0	14	HOT	0	50	3.28	50	191
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	14	0	14	HOT/COLD SPLIT	0	50	3.28	50	191
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	14	0	14	COLD	0	50	3.28	50	191
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	39	0		39	146
Rinse	High	14		14	NONE	0	50	3.28	50	191
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	39	0		39	146
none	None	0		0	NONE	0	0		0	0

60044 RAPID LOAD, STAPH GUARD DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 60044 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
When	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	162	615	72	273	94	359
Following Intermediate Extract	113	429	59	223	63	240

The 60044 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		30	113	29	110	29	109
3	8		34	129	33	123	32	122
4	10		38	145	36	136	35	134
5	13		43	162	40	150	39	146
6	15		47	179	43	163	42	159
7	18	LOW	52	197	47	177	45	171
8	20		57	215	50	191	49	184
9	23		62	234	54	205	52	197
10	25		67	253	58	219	56	210
11	28		72	272	62	234	59	224
12	30	HIGH	77	292	66	249	63	237
13	33		83	313	70	264	66	251
14	36		88	334	74	279	70	265
15	38		94	355	78	295	74	279
16	41		99	376	82	311	78	293
17	43		105	398	86	327	81	308
18	46		111	420	91	343	85	322
19	48		117	442	95	359	89	337
20	51		123	464	99	375	93	351

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				94	0			
none	High	14	0	14	COLD	0	74	3.12	168	637
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	9	0	9	HOT	0	54	2.75	54	205
Drain	None	0		0	NONE	0	0		0	0
none	High	14	0	14	HOT	0	74	3.12	74	280
none	None	0		0	NONE	0	0		0	0
Suds	Low	9	0	9	HOT	0	54	2.75	54	205
none	None	0		0	NONE	0	0		0	0
Flush	High	14	0	14	HOT	0	74	3.12	74	280
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	14	0	14	HOT/COLD SPLIT	0	74	3.12	74	280
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	14	0	14	COLD	0	74	3.12	74	280
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
Rinse	High	14		14	NONE	0	74	3.12	74	280
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
none	None	0		0	NONE	0	0		0	0

64042BTN - DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 64042 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
When	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	162	615	72	273	94	359
Following Intermediate Extract	113	429	59	223	63	240

The 64042 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		30	113	29	110	29	109
3	8		34	129	33	123	32	122
4	10		38	145	36	136	35	134
5	13		43	162	40	150	39	147
6	15		47	179	43	163	42	159
7	18	LOW	52	197	47	177	46	172
8	20		57	215	51	192	49	185
9	23		62	234	54	206	52	198
10	25		67	254	58	221	56	212
11	28		72	274	62	236	60	226
12	30	HIGH	78	294	66	251	63	239
13	33		83	315	70	266	67	253
14	36		89	336	75	282	71	268
15	38		94	357	79	298	75	282
16	41		100	379	83	314	78	297
17	43		106	401	87	330	82	311
18	46		112	423	92	347	86	326
19	48		118	446	96	363	90	341
20	51		124	468	100	380	93	351

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				94	0			
none	High	16	0	16	COLD	0	83	3.29	177	672
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	12	0	12	HOT	0	66	2.98	66	251
Drain	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
Suds	Low	12	0	12	HOT	0	66	2.98	66	251
none	None	0		0	NONE	0	0		0	0
Flush	High	16	0	16	HOT	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT/COLD SPLIT	0	83	3.29	83	314
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	16	0	16	COLD	0	83	3.29	83	314
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
Rinse	High	16		16	NONE	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
none	None	0		0	NONE	0	0		0	0

68036F5N, H5N, H5K DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 68036 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	180	683	80	303	105	399
Following Intermediate Extract	125	476	65	248	70	267

The 68036 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		26	98	25	95	25	94
3	8		30	112	28	107	28	106
4	10		34	128	32	120	31	118
5	13		38	144	35	133	34	130
6	15		42	160	39	146	38	142
7	18	LOW	47	177	42	160	41	155
8	20		52	195	46	174	44	168
9	23		56	213	50	188	48	181
10	25		61	231	53	202	51	194
11	28		66	250	57	217	55	208
12	30	HIGH	71	270	61	232	59	222
13	33		77	290	65	247	62	236
14	36		82	310	69	262	66	250
15	38		87	331	74	278	70	264
16	41		93	352	78	294	74	279
17	43		99	373	82	310	78	293
18	46		104	394	86	326	82	308
19	48		110	416	91	343	86	323
20	51		116	438	95	360	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				94	0			
none	High	16	0	16	COLD	0	83	3.29	177	672
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	12	0	12	HOT	0	66	2.98	66	251
Drain	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
Suds	Low	12	0	12	HOT	0	66	2.98	66	251
none	None	0		0	NONE	0	0		0	0
Flush	High	16	0	16	HOT	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT/COLD SPLIT	0	83	3.29	83	314
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	16	0	16	COLD	0	83	3.29	83	314
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
Rinse	High	16		16	NONE	0	83	3.29	83	314
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	63	0		63	239
none	None	0		0	NONE	0	0		0	0

72044 STAPH GUARD, RAPID LOAD DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 72044 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	252	957	112	424	147	558
Following Intermediate Extract	175	667	91	348	98	373

The 72044 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		36	138	36	134	35	134
3	8		41	156	40	150	39	148
4	10		46	175	44	165	43	163
5	13		51	194	48	181	47	178
6	15		57	215	52	197	51	193
7	18	LOW	62	236	57	214	55	208
8	20		68	258	61	231	59	224
9	23		74	280	66	249	64	240
10	25		80	303	70	266	68	257
11	28		87	327	75	285	72	273
12	30	HIGH	93	351	80	303	77	290
13	33		100	376	85	322	81	308
14	36		106	401	90	341	86	325
15	38		113	427	95	361	91	343
16	41		120	453	101	381	96	361
17	43		127	480	106	401	100	380
18	46		134	507	111	421	105	398
19	48		141	534	117	442	110	417
20	51		149	562	122	463	113	431

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				147	0			
none	High	16	0	16	COLD	0	101	2.95	248	937
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	70	2.59	70	267
Drain	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT	0	101	2.95	101	381
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	70	2.59	70	267
none	None	0		0	NONE	0	0		0	0
Flush	High	16	0	16	HOT	0	101	2.95	101	381
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	16	0	16	HOT/COLD SPLIT	0	101	2.95	101	381
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	16	0	16	COLD	0	101	2.95	101	381
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	98	0		98	372
Rinse	High	16		16	NONE	0	101	2.95	101	381
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	98	0		98	372
none	None	0		0	NONE	0	0		0	0

72046 E5N DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 72044 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	216	820	96	364	126	478
Following Intermediate Extract	150	571	78	298	84	320

The 72044 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		36	137	35	133	35	133
3	8		41	154	39	148	39	146
4	10		46	173	43	162	42	160
5	13		51	191	47	177	46	174
6	15		56	211	51	192	50	187
7	18	LOW	61	231	55	208	53	202
8	20		66	251	59	223	57	216
9	23		72	273	63	239	61	231
10	25		78	294	68	256	65	245
11	28		84	317	72	272	69	261
12	30	HIGH	90	340	77	289	73	276
13	33		96	363	81	307	77	291
14	36		102	387	86	324	81	307
15	38		109	411	90	342	86	323
16	41		115	436	95	360	90	339
17	43		122	461	100	378	94	356
18	46		129	486	105	396	99	372
19	48		135	512	110	415	103	389
20	51		142	538	115	434	103	389

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				126	0			
Flush	High	16	0	0	COLD	0	0	1.75	126	477
Drain	None	0	0	0	NONE	0	0		0	0
Suds	Low	10	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Flush	High	16	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Bleach	Low	10	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Rinse	High	16	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
Rinse	High	16	0	0	HOT/COLD SPLIT	84	0	1.75	84	319
Drain	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0	0	0	NONE	0	0		0	0
Sour Softener	Low	10	0	0	COLD	84	0	1.75	84	319
Drain	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0	0	0	NONE	0	0		0	0
Flush	None	0		0	NONE	84	0		84	319
Flush	None	0		0	NONE	0	0		0	0
Flush	None	0		0	NONE	0	0		0	0

75046 M5K DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the 72044 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	216	820	96	364	126	478
Following Intermediate Extract	150	571	78	298	84	320

The 72044 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		36	137	35	133	35	133
3	8		41	154	39	148	39	146
4	10		46	173	43	162	42	160
5	13		51	191	47	177	46	174
6	15		56	211	51	192	50	187
7	18	LOW	61	231	55	208	53	202
8	20		66	251	59	223	57	216
9	23		72	273	63	239	61	231
10	25		78	294	68	256	65	245
11	28		84	317	72	272	69	261
12	30	HIGH	90	340	77	289	73	276
13	33		96	363	81	307	77	291
14	36		102	387	86	324	81	307
15	38		109	411	90	342	86	323
16	41		115	436	95	360	90	339
17	43		122	461	100	378	94	356
18	46		129	486	105	396	99	372
19	48		135	512	110	415	103	389
20	51		142	538	115	434	103	389

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				126	0			
Flush	High	16	0	0	COLD	0	0	1.75	126	477
Drain	None	0	0	0	NONE	0	0		0	0
Suds	Low	10	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Flush	High	16	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Bleach	Low	10	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Rinse	High	16	0	0	HOT	0	0	1.75	0	0
Drain	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
Rinse	High	16	0	0	HOT/COLD SPLIT	84	0	1.75	84	319
Drain	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0	0	0	NONE	0	0		0	0
Sour Softener	Low	10	0	0	COLD	84	0	1.75	84	319
Drain	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0	0	0	NONE	0	0		0	0
Flush	None	0		0	NONE	84	0		84	319
Flush	None	0		0	NONE	0	0		0	0
Flush	None	0		0	NONE	0	0		0	0

MWR12E5, J5, X5 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWR12 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	9	34	4	15	5	20
Following Intermediate Extract	6	24	3	12	4	13

The MWR12 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		3	11	3	11	3	10
3	8		4	14	4	13	3	13
4	10		5	18	4	16	4	16
5	13		6	21	5	19	5	18
6	15	LOW	6	24	6	21	5	21
7	18		7	28	6	24	6	23
8	20	HIGH	8	31	7	27	7	26
9	23		9	35	8	30	8	28
10	25		10	39	9	33	8	31
11	28		11	42	9	35	9	34
12	30		12	46	10	39	10	37
13	33		14	54	12	47	12	45
14	36		16	62	14	55	14	53
15	38		18	70	16	62	16	60
16	41		20	77	18	70	18	68
17	43		22	84	20	77	20	75
18	46		24	91	22	84	22	82
19	48		26	98	24	91	23	89
20	51		28	104	26	97	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				5	0			
none	High	8	0	8	COLD	0	7	4.13	12	47
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	6	0	6	HOT	0	6	3.64	6	21
Drain	None	0		0	NONE	0	0		0	0
none	High	8	0	8	HOT	0	7	4.13	7	27
none	None	0		0	NONE	0	0		0	0
Suds	Low	6	0	6	HOT	0	6	3.64	6	21
none	None	0		0	NONE	0	0		0	0
Flush	High	8	0	8	HOT	0	7	4.13	7	27
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	8	0	8	HOT/COLD SPLIT	0	7	4.13	7	27
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	8	0	8	COLD	0	7	4.13	7	27
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	4	0		4	13
Rinse	High	8		8	NONE	0	7	4.13	7	27
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	4	0		4	13
none	None	0		0	NONE	0	0		0	0

MWR16E5, J5, X5 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWR16 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
When	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Intitial	13	48	6	21	7	28
Following Intermediate Extract	9	33	5	17	5	19

The MWR16 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		2	7	2	7	2	6
3	8		3	10	2	9	2	9
4	10		4	14	3	11	3	11
5	13		5	17	4	14	3	13
6	15		6	21	4	17	4	16
7	18		7	25	5	20	5	18
8	20	LOW	8	29	6	23	6	21
9	23		9	33	7	26	6	24
10	25	HIGH	10	37	8	29	7	26
11	28		11	42	8	32	8	29
12	30		13	50	10	39	10	37
13	33		16	61	13	50	13	48
14	36		19	72	16	61	15	59
15	38		22	83	19	72	18	69
16	41		25	94	22	83	21	80
17	43		28	104	25	94	24	91
18	46		30	115	28	105	27	102
19	48		33	125	30	115	30	112
20	51		36	136	33	125	33	125

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				7	0			
none	High	10	0	10	COLD	0	8	3.55	15	56
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	6	3.17	6	23
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	8	3.55	8	29
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	6	3.17	6	23
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	8	3.55	8	29
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	8	3.55	8	29
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	8	3.55	8	29
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	5	0		5	19
Rinse	High	10		10	NONE	0	8	3.55	8	29
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	5	0		5	19
none	None	0		0	NONE	0	0		0	0

MWR18E4, X4, J6, J4 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWR18 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
When	100% Cotton		100% Polyester		50/50 PolyCotton	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
Intitial	14	55	6	24	8	32
Following Intermediate Extract	10	38	5	20	6	21

The MWR18 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		2	7	2	7	2	6
3	8		3	10	2	9	2	9
4	10		4	14	3	11	3	11
5	13		5	17	4	14	3	13
6	15		6	21	4	17	4	16
7	18		7	25	5	20	5	18
8	20	LOW	8	29	6	23	6	21
9	23		9	33	7	26	6	24
10	25	HIGH	10	37	8	29	7	26
11	28		11	42	8	32	8	29
12	30		12	46	9	35	8	32
13	33		14	53	11	41	10	38
14	36		17	64	14	52	13	49
15	38		20	75	17	63	16	60
16	41		23	86	20	74	19	71
17	43		26	96	22	85	22	81
18	46		28	107	25	95	24	92
19	48		31	118	28	106	27	102
20	51		34	128	31	116	13	51

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				8	0			
none	High	10	0	10	COLD	0	8	3.32	16	60
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	6	2.99	6	23
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	8	3.32	8	29
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	6	2.99	6	23
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	8	3.32	8	29
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	8	3.32	8	29
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	8	3.32	8	29
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	6	0		6	21
Rinse	High	10		10	NONE	0	8	3.32	8	29
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	6	0		6	21
none	None	0		0	NONE	0	0		0	0

MWR27E5, X5, J5 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWR27 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	22	82	10	36	13	48
Following Intermediate Extract	15	57	8	30	8	32

The MWR27 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		5	20	5	18	5	18
3	8		6	23	6	21	6	21
4	10		7	28	6	24	6	24
5	13		8	32	7	28	7	26
6	15		10	36	8	31	8	29
7	18		11	41	9	34	8	32
8	20	LOW	12	45	10	37	9	35
9	23		13	50	11	40	10	38
10	25	HIGH	15	55	12	44	11	41
11	28		16	60	12	47	12	44
12	30		17	65	13	50	12	47
13	33		18	70	14	54	13	50
14	36		20	75	15	57	14	53
15	38		23	87	18	69	17	64
16	41		27	100	22	82	21	78
17	43		30	114	25	96	24	91
18	46		34	127	29	109	28	105
19	48		37	141	32	123	31	118
20	51		41	154	36	136	33	131

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				13	0			
none	High	10	0	10	COLD	0	12	3.36	24	91
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	10	3.12	10	37
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	10	3.12	10	37
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	12	3.36	12	44
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	12	3.36	12	44
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	8	0		8	32
Rinse	High	10		10	NONE	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	8	0		8	32
none	None	0		0	NONE	0	0		0	0

MWF27J8, Z8 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWF27 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	22	82	10	36	13	48
Following Intermediate Extract	15	57	8	30	8	32

The MWF27 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		5	20	5	18	5	18
3	8		6	23	6	21	6	21
4	10		7	28	6	24	6	24
5	13		8	32	7	28	7	26
6	15		10	36	8	31	8	29
7	18		11	41	9	34	8	32
8	20	LOW	12	45	10	37	9	35
9	23		13	50	11	40	10	38
10	25	HIGH	15	55	12	44	11	41
11	28		16	60	12	47	12	44
12	30		17	65	13	50	12	47
13	33		18	70	14	54	13	50
14	36		20	75	15	57	14	53
15	38		23	87	18	69	17	64
16	41		27	100	22	82	21	78
17	43		30	114	25	96	24	91
18	46		34	127	29	109	28	105
19	48		37	141	32	123	31	118
20	51		41	154	36	136	33	131

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				13	0			
none	High	10	0	10	COLD	0	12	3.36	24	91
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	10	3.12	10	37
Drain	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	10	3.12	10	37
none	None	0		0	NONE	0	0		0	0
Flush	High	10	0	10	HOT	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	10	0	10	HOT/COLD SPLIT	0	12	3.36	12	44
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	10	0	10	COLD	0	12	3.36	12	44
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	8	0		8	32
Rinse	High	10		10	NONE	0	12	3.36	12	44
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	8	0		8	32
none	None	0		0	NONE	0	0		0	0

MWF45J8, Z8 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWF45 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	36	137	16	61	21	80
Following Intermediate Extract	25	95	13	50	14	53

The MWF45 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		8	28	7	27	7	27
3	8		9	33	8	30	8	29
4	10		10	37	9	33	8	32
5	13		11	41	10	36	9	35
6	15		12	46	10	39	10	37
7	18		13	51	11	42	11	40
8	20	LOW	15	56	12	45	11	42
9	23		16	61	13	48	12	45
10	25		17	66	14	51	13	47
11	28		19	71	14	55	13	50
12	30		20	77	15	58	14	53
13	33	HIGH	22	82	16	61	15	55
14	36		23	88	17	64	15	58
15	38		25	93	18	67	16	61
16	41		26	99	19	71	17	63
17	43		28	107	20	77	18	69
18	46		33	125	25	95	23	87
19	48		38	142	30	113	28	105
20	51		42	160	35	130	33	125

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				21	0			
none	High	13	0	13	COLD	0	16	3.10	37	140
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	8	0	8	HOT	0	12	2.75	12	45
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	16	3.10	16	61
none	None	0		0	NONE	0	0		0	0
Suds	Low	8	0	8	HOT	0	12	2.75	12	45
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	16	3.10	16	61
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	16	3.10	16	61
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	16	3.10	16	61
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	14	0		14	53
Rinse	High	13		13	NONE	0	16	3.10	16	61
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	14	0		14	53
none	None	0		0	NONE	0	0		0	0

MWF63J7, Z7 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWF63 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Initial	50	191	22	85	29	112
Following Intermediate Extract	35	133	18	70	20	75

The MWF63 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting range	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm		gallons	Liters	gallons	Liters	gallons	Liters
2	5		7	26	6	24	6	24
3	8		8	32	8	29	8	28
4	10		10	39	9	34	9	33
5	13		12	46	11	40	10	38
6	15		14	53	12	45	11	43
7	18		16	61	13	51	13	48
8	20		18	69	15	57	14	54
9	23		20	77	17	63	16	59
10	25	LOW	23	85	18	69	17	65
11	28		25	94	20	75	19	70
12	30		27	103	22	82	20	76
13	33	HIGH	29	111	23	88	22	82
14	36		32	120	25	95	23	88
15	38		34	130	27	101	25	94
16	41		37	139	29	108	26	100
17	43		39	148	30	115	28	106
18	46		42	158	32	122	30	112
19	48		44	167	34	128	31	118
20	51		47	177	36	135	33	124

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				29	0			
none	High	13	0	13	COLD	0	23	3.14	53	199
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	18	2.84	18	69
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	23	3.14	23	88
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	18	2.84	18	69
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	23	3.14	23	88
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	23	3.14	23	88
Drain	None	0		0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	23	3.14	23	88
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	74
Rinse	High	13		13	NONE	0	23	3.14	23	88
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	20	0		20	74
none	None	0		0	NONE	0	0		0	0

MWF77J7, Z7 DATA SHEET

This table lists the quantity of water initially absorbed by a nominal load of goods in the MWF77 washer extractor and the quantity reabsorbed following an intermediate extract, for the fabric types shown.

ABSORBED WATER						
	100% Cotton		100% Polyester		50/50 PolyCotton	
When	Gallons	Liters	Gallons	Liters	Gallons	Liters
Intitial	61	232	27	103	36	136
Following Intermediate Extract	43	162	22	84	24	91

The MWF77 washer-extractor will use additional water as shown in this table, to fill to the water levels indicated, for the fabric types shown. The factory-set/recommended low and high levels are as shown, but other levels may be used.

FREE WATER								
Water Level		Factory Setting	100% Cotton		100% Polyester		50/50 Poly-Cotton	
Inches	cm	range	gallons	Liters	gallons	Liters	gallons	Liters
2	5		13	49	12	47	12	47
3	8		15	57	14	54	14	53
4	10		17	66	16	61	16	59
5	13		20	75	18	68	17	66
6	15		22	84	20	75	19	72
7	18		25	94	22	82	21	79
8	20		28	104	24	90	23	86
9	23		30	114	26	97	24	93
10	25	LOW	33	125	28	105	26	100
11	28		36	135	30	113	28	107
12	30		39	146	32	121	30	114
13	33	HIGH	42	157	34	129	32	121
14	36		45	169	36	137	34	128
15	38		48	180	38	145	36	136
16	41		51	192	41	154	38	143
17	43		54	203	43	162	40	151
18	46		57	215	45	170	42	158
19	48		60	227	47	179	44	166
20	51		64	242	51	191	48	181

The following example is based on a nominal load of 50/50 poly-cotton goods, the factory-set/recommended water levels, and the wash formula shown.

Operation	Level	Factory set Water level in inches	Programmed Level	actual programmed water level inches	Fill water HOT,COLD,REUSE, HOT/COLD SPLIT, HOT/REUSE SPLIT,COLD/REUSE SPLIT	Added Absorbed water	Added Free Water	TOTAL LIQUOR TO GOODS RATIO (X:1)	Water Consumption	
									Gallons	Liters
Initially Absorbed Water	None	0				36	0			
none	High	13	0	13	COLD	0	34	3.42	70	264
none	None	0	0	0	NONE	0	0		0	0
Flush	Low	10	0	10	HOT	0	28	3.11	28	105
Drain	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
Suds	Low	10	0	10	HOT	0	28	3.11	28	105
none	None	0		0	NONE	0	0		0	0
Flush	High	13	0	13	HOT	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	High	13	0	13	HOT/COLD SPLIT	0	34	3.42	34	129
Drain	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
Rinse	High	13	0	13	COLD	0	34	3.42	34	129
none	None	0	0	0	NONE	0	0		0	0
none	None	0	0	0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	24	0		24	90
Rinse	High	13		13	NONE	0	34	3.42	34	129
none	None	0		0	NONE	0	0		0	0
Intermediate extract	None	0		0	NONE	0	0		0	0
none	None	0		0	NONE	24	0		24	90
none	None	0		0	NONE	0	0		0	0

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Glossary

Abrasion resistance– Degree to which a fabric is able to withstand surface wear and rubbing.

Absorption– Ability of a porous solid to hold, within its body, gases or liquids.

Acetic Acid– A weak organic acid (CH_3COOH). Leaves a residual odor when used as a laundry sour.

Acid– A substance that yields H^+ (H_3O^+) cations in water solution.

Acid dye– A type of dye requiring an acid environment during application; used for dyeing animal fibers.

Acid number (acid value)– The measure of the amount of free acid in a substance; expressed as the number of milligrams of potassium hydroxide required to neutralize one gram of substance.

Acrylic– 1. Generic name of a manufactured fiber containing 85% polyacrylonitrile. 2. A prefix used to describe a number of products made from acrylic acid or acrylates.

Activated carbon– Carbon specially treated to give it the ability to attract and hold dissolved substances in dry-cleaning solvent.

Adsorption– Taking up of a substance by a solid or liquid surface.

Affinity– The attraction of one substance for another, as a textile fiber for a dye.

Agglomerate– To coagulate or bunch particles into larger masses.

Agitation– The motion of fabrics in the washing solution created by the mechanical motion of the wash wheel.

Air permeability– Ability of a fabric to allow air to pass through it as determined by its porosity. Air permeability is a factor in the warmth of blankets, for example.

Albuminous– Containing one of several normally soluble natural proteins such as egg whites.

Aliphatic– An organic molecule that has an open chain of carbon atoms (could be straight, branched, saturated, or unsaturated).

Alkali– A substance that yields negatively charged hydroxide (OH^-) anions in a water solution. Alkaline substances, when dissolved in water, produce a slick feel, turn red litmus paper blue, and give solutions a pH value greater than 7.

Alkaline hydrolysis– A chemical process that uses alkaline materials to break down other molecular units. The term is often applied to chemical damage to polyester fibers caused by contact with a strong alkaline solution.

Alkaline pressure– A measure of the alkalinity of a solution as expressed by its percentage of sodium oxide content.

Amine– A compound that may be regarded as a derivative of NH_3 (ammonia) in which one or more of the hydrogen atoms has been replaced by hydrocarbon radicals.

Anhydrous– Free from water, as in anhydrous metasilicate.

Aniline dye– A type of dye derived chemically from aniline or other coal tar derivatives.

Anionic– A class of surfactants that produces negatively charged active ingredients when dissolved in water.

Antibacterial– A chemical agent that is able to kill or retard the growth of bacteria.

Antichlor– Reducing chemicals used in rinse or sour baths to facilitate complete removal of residual chlorine. They include sodium bisulfite, sodium thiosulfate, and proprietary antichlors.

Antimycotic– Having the property to minimize the growth of mold or mildew.

Antiseptic– A substance, generally applied to living tissue, that prevents or arrests the growth of microorganisms either by inhibiting their activity or destroying them.

Anti-static– Able to disperse electrostatic charges on a fabric and prevent buildup of static electricity.

Aseptic– Free of microorganisms capable of causing infection.

Aspergillus niger– A type of fungus responsible for the development of mildew in fabrics.

Atmospheric fading (gas or fume fading)– Fading of some dyestuffs through exposure to certain gases given off during the burning of fuels.

Alkylbenzene– A class of surfactants that contain both a hydrocarbon chain and a benzene ring structure in the hydrophobic portion of the molecule.

Alkylbenzene Sulfonates– A class of surfactants that contain both a hydrocarbon chain and a benzene ring structure in the hydrophobic portion of the molecule. The hydrophilic portion of the surfactant molecule is a sulfonate group.

Amide– A chemical compound resulting from the reaction of an organic acid with an amine.

Ammonia– Derivatives- See Amine, Amide, and Quats.

Ammonium– Hydroxide- An alkaline material (NH_4OH) also known as aqueous ammonia.

Amphoterics– A surfactant having both anionic and cationic groups and properties.

Amylase– A class of enzymes that catalyze the decomposition of starch.

Anion– The negative (-) charged ion in an electrolytic solution.

Anionic– A class of surfactants that produces a negative (-) charge in the molecule.

Anthraquinone– A class of colorfast vat dyes.

Antibacterial– See current glossary

Antimicrobial– A chemical agent that is capable of killing or retarding the growth of microorganisms including bacteria and mildew.

Archimedean Screw– A pump design invented by Archimedes. Design applies to some bottom transfer tunnel washers where the load is advanced by the rotation of partition sections that form what looks like the thread of a screw.

Basic dye– A type of dye capable of coloring silk and wool directly but requiring an assistant on cotton. Although they produce a very bright color, such dyes are little used because of their poor fastness.

Bentonite– A colloidal clay capable of absorbing large quantities of an oily soil.

Bichloride of mercury– Sometimes referred to as bichloride or corrosive sublimate. A poisonous, corrosive salt of mercury used chiefly in pharmaceuticals and antiseptics. It frequently attacks and tenders cottons and linens, and the damage does not appear until the textiles are laundered.

Biochemical oxygen demand (BOD)– A measure of the amount of oxygen consumed in the biological process that breaks down organic matter in water. Large amounts of organic waste use up large amounts of dissolved oxygen, thus the greater the degree of pollution, the greater the BOD.

Biodegradable– A substance subject to the process of biodegradation.

Biodegradation– The decomposition of a natural or synthetic substance through the action of bacteria and other microorganisms in water with the assistance of sunlight and dissolved oxygen.

Bleach bath (bleach suds)– The bath in which bleach is added as the last detergency- promoting agent incorporated into the laundry formula. In the past, this step has been referred to as the bleach suds because a light running suds was taken as the visual indicator that the pH was correct. With the advent of low-sudsing synthetic detergents and the placement of flushes between break and bleach to lower alkalinity for correct pH at the bleach, testing for bleach pH rather than using the visual presence of suds is a necessity.

Bactericide– A chemical agent that is capable of killing bacteria.

Bacteriostat– A chemical agent that is capable of retarding the growth of bacteria.

Base Exchange– A water softening process that softens water by exchanging the sodium ions of certain natural greensands (glaucinite) or synthetic mineral resins with the calcium and magnesium hardness in water.

Bath– A batch washing term used to describe a washing step and includes the contents of the wash liquor.

Bicarbonate Alkalinity– Alkalinity due to the presence of sodium bicarbonate (NaHCO_3). Used as a measure of water quality and rinsing efficacy.

Bigenetic– A manufactured fiber formed by combining two or more generic classes of polymers at the time the fiber is extruded.

Bleaching in the clear– Bleaching under conditions where minimal amounts of soil, chemicals, and other materials remain in the solution.

Bleaching intensity– The quantity, concentration, time, and temperature of bleaching.

Bleed– To lose dye from a colored fabric during laundering or dry-cleaning can be caused by improper cleaning methods, dye application, or excess surface dye.

BOD– Biochemical oxygen demand. A term used to describe certain contaminants of wastewater.

Body– The compact, solid, or firm feel of a fabric.

Body Oils– Oils that come from the surface of the skin. These are common soils for hotel and hospital linen items.

Boiling point– The temperature at which a substance passes from the liquid to the vapor state.

Bolt– A roll or length of fabric.

Bonding– A process of pressing fibers into thin sheets or webs held together by adhesive chemicals.

Borax– A weak and sparingly soluble alkali; known chemically as sodium tetraborate.

Break (break suds)– The first wash chemical bath. In light and medium soil formulas, all of the surfactant/detergent and alkali to

be used in the entire formula is generally added to the washer in the break bath. The break is the single most important step in the laundering process from the standpoint of soil removal.

Break compound– Any washroom supply used in the break or initial operation in the washing formula.

Broadcloth– A fine, rich-looking, closely woven cotton fabric, usually mercerized. Most dress shirts are broadcloth.

Brownian movement– A ceaseless movement of ultra-microscopic particles of colloidal nature, first observed by an investigator named Brown. This movement is important in detergent processes and is exhibited by soap and other colloidal substances.

Brush– To finish knitted or woven fabrics by raising a nap on them with circular brushes.

Btu– British thermal unit, used to measure energy content, production, and use.

Buffer– Substance or mixture of substances that in solution maintains a constant hydrogen ion concentration despite addition of comparatively large amounts of acid or alkali.

Builder– Alkaline components of detergent/soap solutions that enhance detergency.

Building– The use of an alkali to enhance the detergent efficiency of a soap/detergent solution.

Built Detergent– A detergent mix containing surfactant and one or more builders to enhance detergency.

Bursting strength– The pressure required to rupture a fabric.

Calcium Soap– Also known as lime soap. Formed by the interaction of the calcium in hard water with soaps. These soaps are insoluble and lead to the formation of soap specs.

Calico– A coarse, printed cotton fabric, usually made from low-grade cotton and heavily sized.

Carbonate– An alkaline chemical salt in which carbonic acid is the neutralized acid.

Carboxymethylcellulose (C₆H₇O₂(OH)₂OCH₂COOH)_n– Used as a surface-active agent. (See surfactant.)

Carboy– A container often encased in a protective covering and usually used to hold from 5 to 15 gallons of a corrosive liquid.

Carded Yarn– A type of yarn in which the fibers have been partially aligned by a brushing process before making them into yarns. Coarser, larger, hairier, and weaker than combed yarns.

Carryover (carryover suds)– A cleaning step in a laundry formula in which no supplies are added, but supplies previously added are retained for use.

Catalyst– A substance capable of speeding up a chemical reaction. It can be recovered practically unchanged at the end of the reaction.

Cation– The positive (+) charged ion in an electrolytic solution.

Cationic– A class of surfactants that produces positively charged active ingredients when dissolved in water.

Caustic potash– See potassium hydroxide.

Caustic soda– See sodium hydroxide.

Causticity– The amount of free alkali or hydroxyl ions liberated when alkaline salts are dissolved in water.

Cellulase– A class of enzymes that catalyze the decomposition of cellulose.

Celsius– Referring to a temperature scale in which the interval between the freezing point and the boiling point of water, under standard pressure conditions, is divided into 100 equal parts or degrees, so that 0°C corresponds to 32°F and 100°C to 212°F. Indicated by the letter C after the stated temperature.

Centigrade– See celsius.

Centrifugal force– The force that tends to propel a thing or its parts outward from a center of rotation.

Chaetomium globosum– A microorganism responsible for the development of mildew in textile fabrics.

Charged system– A method of cleaning, employing dry cleaning solvent to which a quantity of detergent has been added for improved cleaning.

Chelate– To tie up or render certain substances inactive.

Chelating agent– A substance that has the ability to tie up and render certain substances, such as hardness salts and iron, inactive in water.

Chemical Decomposition– A chemical reaction that results in a chemical being converted to two or more different chemicals

Chemical oxygen demand (COD)– A measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water. The COD test, like the BOD test, is used to determine the degree of pollution in an effluent.

Chino– A particular type of all-cotton, khaki-colored army twill made of combed two-ply cotton yarns.

Chintz– A glazed cotton fabric often printed with figures and large flower designs.

Chloride of lime– A low grade of calcium hypochlorite assaying 35% available chlorine.

Chlorite– The bleaching agent sodium chlorite.

Chrome dye– A type of dye that uses a chromium compound as a mordant or assistant.

CIU– Categorical Industrial User. Term used by EPA to describe certain wastewater generating industries.

Clarify– To remove foreign matter and soluble impurities from a solvent usually by distillation or filtration.

Classify– To separate goods according to degree of soil and resistance of fabric and color to physical and chemical attack.

Clean– 1. Process to remove soils. 2. State of a substance after soils have been removed.

Cleaning cycle– The total time consumed from the beginning to the end of a complete round of cleaning operations.

Clearing agent– A material added to lower the cloud point of a liquid detergent product.

Cloud point– The temperature at which a nonionic detergent or wetting agent, in solution, tends to become cloudy with consequent decreased solubility and effectiveness.

CMC– See carboxymethylcellulose.

Coagulate– To clot or consolidate into a mass. The solidification of egg white by boiling is an example.

Coalesce– The tendency for smaller droplets of a liquid to form one larger drop. In a good emulsion, coalescence does not occur.

COG– See NOG. Customer-owned goods.

Colloidal– State of subdivision of matter in which particles of 100 μ (microns) are dispersed in a continuous medium.

Color buildup– Accumulation of loose or non-fast dyes and other coloring matter from fabrics in a cleaning solvent.

Colorimeter– An optical instrument for measuring color intensity; used to evaluate and standardize a colored solution.

Combed yarn– A cotton yarn that has been subjected to a special combing operation to remove short fibers and impurities remaining after the carding operations. This added process produces finer, smoother, and stronger yarns.

Compatible– Capable of being used in conjunction with other materials without loss of essential properties.

Complex Phosphates– A class of phosphorus/oxygen compounds (such as sodium hexametaphosphate, sodium tripolyphosphate, or tetrasodium pyrophosphate) that are very effective in improving soil removal. However, phosphate use is restricted or banned in some areas.

Compound– A chemical term used to describe substances formed by combining atoms and ions according to the laws for chemical combination. They are represented by a formula that indicates the ratio of atoms making up the substance.

Condensate– The purified substance, usually water or solvent, formed as a result of a condensing or distilling action.

Condensate of Ethylene Oxide– A type of nonionic surfactant.

Condense– To reduce from one state to another state with a denser form, as steam to water. Also, to compress or compact.

Condition– To prepare goods for ironing, pressing, or other finishing operations by running in a tumbler until desired moisture retention is reached.

Congee– Change in the state of matter from liquid to solid.

Construction– The number of yarns per inch in warp and filling in a fabric; for example, 60 X 52 means 60 yarns per inch of warp and 52 yarns per inch of filling.

Contact stain– A stain acquired by a textile touching a staining surface or another textile and picking up color.

Continuous Batch Washers– A type of washing machine in which the load is transferred along a series of compartments, usually in the opposite direction to the intended flow of water.

Corduroy– A coarse, durable fabric having a piled surface raised in cords, ridges, or ribs.

Count– See yarn count.

Counterflow– A concept in which textiles being processed in a tunnel washer and the water used for processing them move through the machine in opposite directions.

Coupling agent– A substance soluble in both water and in material to be emulsified; improves the stability of an emulsion.

Crease resistant– Refers to fabrics with high resistance to wrinkling or creasing and good recovery from wrinkling. Often obtained by chemical finishing as in durable press.

Cretonne– A drapery or slip cover fabric, usually printed, similar to chintz, but without glaze.

CRF– Abbreviation for crease-resistant finish.

Crimp– To apply a wavy appearance to a fiber or yarn by means of a twist or mechanical application.

Crock– To rub loose dye off one fabric onto another. May also be a container for chemicals.

Cross-infection– An infection that is acquired from a contaminated environment.

Crowsfeet– Indistinct wrinkles in a fabric.

Crystal– A physical shape or form of matter, always conforming to a definite geometric pattern.

Crystalline– Being in the form of crystals. A material that is not crystalline is amorphous.

Culture– A growth of microorganisms on a nutrient medium; to grow microorganisms on such a medium.

Cuprous Oxide– Copper (I) Oxide. Cu_2O . A reddish to pink colored solid ionic compound of copper.

Cure– To set a resin finish in treated fabric by converting it to the insoluble form by heat.

Cut pile– Fabrics such as velvets, plush, or corduroy in which pile surface is produced by cutting yarns, either warp or filling, that were originally woven in loop form.

Cyanuric Acid– Triazinetriol; trihydroxy cyanide; tricyanic acid; tricarbimide ($\text{N}_3\text{C}_3(\text{OH})_3$). Derivatives used in production of dry organic chlorine bleaches. Cyanuric acid derivatives are useful as bleaching agents: trichloroisocyanuric acid (TCCA), dichloroisocyanuric acid (DCCA), sodium dichloroisocyanurate (NaDCC), and potassium dichloroisocyanurate (KDCC).

Dalton– A unit of mass commonly used by colloid separation chemists but actually out of date. A Dalton corresponded to the atomic masses first assigned by Dalton based on $H = 1.0$. The modern system of amu (atomic mass units) is based on $C = 12.0$; small difference.

Damask– A type of fabric in which the figures are formed by contrast between warp and filling yarns. The figures appear reversed on the wrong side.

DCCA– A dry organic chlorine bleach (dichloroisocyanuric acid)

Decompose– To break up into similar component parts heat or chemical action; for example, the decomposition by heat of sodium bicarbonate into soda ash and carbonic acid.

Deflocculate– The breaking down of solid soils such as carbon, dust, earth, and clay into smaller particles - deflocculated.

Degradation– Partial or complete destruction of a substance.

Degrease– To remove grease and oils from garments prior to laundering or dry cleaning with detergent and water.

Degree of Polymerization The number of repeating units making up a polymer of average length. Increases with molecular weight of the polymer.

Deleterious– Harmful or destructive, as the action of strong acids on fabrics.

Deliquesce– The act of a solid turning to a liquid due to the absorption of atmospheric moisture.

Denier– The weight in grams of 9,000 meters of fiber or yarn. The lower the denier number, the finer the yarn.

Density– A substance's weight per unit of volume. With dry products, it is generally expressed as lbs per cubic foot; with liquid products, as lbs per gallon.

Deodorize– To destroy or mask odor.

Deposit– To settle upon, as limesoap on a washwheel.

Desalination– Water purification process of removing salt from water. Normal application uses seawater as the raw water source.

Desize– To remove the sizing from textile fabric.

Desizing agent– A compound that has the capability of removing sizing from textile fabric. Some enzymes are excellent desizing agents.

Dessicate– To remove moisture, to dry.

Detergent– A surface-active agent or a blend of chemicals containing surface active agents that concentrates at all the surfaces in the washing zone and aids in the removal of insoluble foreign substances or soil from textile fibers.

Diatomaceous earth– The hard skeletal remains of microscopic plants called diatoms. Used in filter powder.

Dichloro-5,5 dimethyl hydantoin– See Hydantoin

Dichloroisocyanuric Acid– See cyanuric acid. DCCA.

Diffuse– To spread or penetrate rapidly throughout.

Dilution– A process using water to remove suspended soil from the washer by lowering the concentration of soil in each successive bath. Dilution occurs with each drain and fill. It is frequently monitored to evaluate the effectiveness of rinsing. For conventional washers, as the water from each bath is dumped from the washer, soil is removed so that the water in the next bath has to suspend less soil. Dilution depends upon the total amount of water in the washer for each bath and the amount of water retained by the load after draining.

Dimensional stability– Ability of fabric to retain its shape and size after being subjected to wear, washing, and dry cleaning.

Direct dye– A type of dye used primarily to dye cotton and rayon, for which it has good affinity.

Dirt– Foreign matter out of place such as soil or stains.

Discrete– Of a specific and consistent size. Normally applied to load sizes.

Disinfect (disinfectant)– To free from infection, usually with a chemical agent that destroys disease germs or other harmful microorganisms.

Disinfectant detergent– A chemical compound formulated to disinfect while it cleans.

Disperse– To scatter finely divided particles in such a manner that the individual particles are not visible to the naked eye.

Dissolved Solids– A wastewater term that refers to how much solid would be obtained in a specified amount of water were evaporated.

Dissolving– Chemical process of a solid, liquid, or gas being separated into individual molecules or ions and distributed throughout a solvent (usually liquid). Application to laundering is primarily dissolving of solid or liquid soils and chemicals in water.

Distill– To purify a liquid, such as contaminated dry cleaning solvent by boiling, condensing, and collecting its vapors.

D.P.– Abbreviation for durable press.

Drill– A stout twilled cotton fabric.

Drip dry– See wash-and-wear.

Dry side– Pertaining to cleaning or spotting agents that dissolve in dry cleaning solvents but not in water.

Duck– A dense, heavy cotton fabric usually having two warp yarns woven as one. Lighter weights used for service coats and uniforms, the heavier for tents, awnings, tarpaulins, aprons, and wherever unusual

Durable press– A long-lasting finish applied to textile fabrics to improve their crease and wrinkle resistance. Synthetic resins are normally used for this purpose and are usually applied to cotton fabrics or blends of cotton and polyester.

Dye– Complex chemical coloring matter having an affinity for textile fibers.

EDTA– Ethylenediaminetetraacetic acid. A strong sequestering agent for metal ions.

Effluent – Industrial waste. Liquid sewage after undergoing some treatment.

Elasticity– The ability of fibers, yarns, or woven and knit fabrics to return to their original shape after being stretched.

Electrolysis– A decomposition caused by an electrical current.

Electrolyte– A solution that easily conducts electricity.

Elongation– Lengthening or stretching of a textile fiber, yarn, or thread by a force applied to it. It is expressed as a percentage of the original length.

Embedded– Refers to solid particles trapped in small opening such as soil particles in fabric.

Emulsification– Method of dispersing one immiscible liquid in another.

Emulsified– See Emulsification.

Emulsifying– See Emulsification.

Enzymatic Chemistry– Detergent chemistry using the action of enzymes to catalyze the removal of one or more types of soil.

Enzyme– One of many complex proteins formed by living organisms that are capable of increasing the speed of some decomposition reactions.

Enzyme Detergents– Detergent containing one or more classes of enzymes in addition to a surfactant.

ESCHERICHIA COLI (E. COLI)– A bacteria found in the intestine and fecal matter.

Esterification– A process of producing an ester (-C-O-) by reaction of an alcohol with an acid.

Ethylene Oxide– (CH₂)₂O. 1,2-epoxy ethane. Used as a fumigant and in the synthesis of surfactants and other organic compounds.

Ethylene Oxide Adducts of Alkyl Phenol– A class of nonionic surfactants made by reaction of alkyl phenol with ethylene oxide.

Eutrophication– The process by which a body of water, such as a lake, becomes rich in dissolved nutrients with consequent oxygen deficiency. Eutrophication may occur natural means or by artificial means such as contamination by fertilizers.

Extensibility– Length gained by stretching a fiber, yarn, or thread to the breaking point. It is expressed as a percentage of the original length.

Extrusion– Process of forming manufactured textile fibers by forcing polymers or pre-polymers through a spinneret and then

hardening into fiber form.

Fabric– A system of textile fibers produced first by building yarns and then weaving or knitting these yarns.

Fabric Brighteners– See optical brighteners.

Fabric softener– A chemical added to the washer during or after the sour bath for the purpose of improving the feel or hand and suppleness and reducing harshness of fabrics.

Fade-ometer– A standard laboratory device for testing the fastness of a colored fabric to sunlight.

Fahrenheit– Referring to a temperature scale on which the interval between the freezing point of water at 32°F and the boiling point 212°F, under standard pressure conditions, is divided into 180 equal parts or degrees. Indicated by the letter F after the stated temperature.

Fast color– A color that when applied to a fiber will not fade or change shade by exposure to sunlight, washing processes, or body wastes.

Fatty Acids– Organic acids obtained from the decomposition (saponification) of fats and oils.

Feedwater Treatment– Treatments applied to the incoming water prior to softening or use in a boiler.

Felt– To shrink wool fabrics with accompanying interlocking of the fibers.

Ferric Hydroxide– Iron (III) hydroxide $Fe(OH)_3$. This compound is an ingredient of rust found in water.

Ferric Ion– Iron (III) ion or Fe^{+++} . The form of iron found in rust.

Fiber Lubricant– Chemicals (such as fabric softeners) added to textiles to allow easier movement of the fibers.

Filament– A fine, continuous fiber, such as silk, rayon, polyester, or nylon.

Filler– A material added to soap or other detergent that does not improve its effectiveness under the conditions of use.

Film– A thin coating, layer, or membrane. Colloidal films have an important part in emulsification and adsorption.

Flame retardant (flame resistant)– Pertaining to fabric treated or impregnated to resist burning. Also a chemical compound capable of imparting flame resistance to fabrics.

Flammable– Capable of being easily ignited and burned.

Flash point– The lowest temperature at which the vapors of a liquid decompose to a gaseous mixture that can be ignited.

Flatwork ironer rolling– The rolling that occurs, under certain conditions, to the edges of flatwork when they pass through a chest-type ironer.

Floatation– A water treatment process that brings contaminants to the surface of the water. Usually removed by skimming.

Fluorocarbon– A highly volatile solvent similar to perchloroethylene except that it contains fluorine atoms in place of chlorine in its chemical makeup.

Flush– A high-level bath for a short period of time prior to the break or the bleach bath. Flushes generally are used for conditioning textiles before subsequent baths and for removing debris and loose soil.

Foam/foaming agent– A colloidal phenomenon involving an air-liquid colloidal system. A material that increases the stability of this colloidal phenomenon.

FOG– A wastewater term referring to the content of fats, oils, and greases.

Formic Acid– Methanoic Acid ($HCOOH$). Limited use as a laundry sour due to odor and possible skin irritation.

Fortified– Adding additional chemical ingredients to a product or solution to enhance performance or avoid problems.

Fray– To wear out due to rubbing or friction.

Free Fatty Acids– Acids that come from fats and have been separated from the rest of the fat molecule. Can be produced by the reaction of soaps with acids.

Fugitive (color)– A color that has poor affinity for the fiber to which it is applied and has a tendency to bleed, run, or be washed away entirely.

Fused fabric– A resilient two-layer collar or cuff bonded together by an intervening solid film or binder.

FWA– Fluorescent whitening agent. See Optical brightener.

Gas fade– To fade or to change color because of contact with gas fumes in the air.

Generic Chemicals– Chemicals with names based on the systematic rules of nomenclature for chemical compounds. As opposed to brand names or trademark names.

Germicide– Anything that destroys germs (microorganisms); applied especially to agents that kill disease germs.

G Force– A method of measuring forces in multiples of the force of gravity. Applied to cylindrical washers and extractors by the equation: $G \text{ force} = d(RPM)^2/70414$,

where: G = force at the inner edge of the wheel circumference, d = diameter in inches, and RPM = revolutions per minute.

Gingham– A yarn-dyed cotton fabric usually woven in checks or stripes.

Glacial Acetic Acid– See acetic acid.

Globule– A small drop of a liquid or particle of solid.

Glyceride– A chemical compound composed of fatty acids and glycerine. When reacted with strong, hot caustic, it forms soap and glycerine.

Go-back– An improperly laundered or dry cleaned piece sent back for recleaning.

Grains– A unit of mass. 1 gram = 15.432 grains

Gram Negative– A class of bacteria. They are sometimes referred to as soil bacteria, and are associated in humans with intestinal waste. Typical of these is *Escherichia coli* (“*E. coli*”) found in large number in fecal matter.

Gram Positive–A class of bacteria. In general, the gram positives are indigenous to the upper respiratory system and skin of humans, and are typified by *Staphylococcus aureus* (“staph”).

Gravity (specific)– The relative weight of a certain volume of a solid or liquid compared with the weight of the same volume of water.

Gray– Dull appearance of fabric color due to redeposition of soil or dye from wash water or solvent.

Grease– A general name for oily solids.

Greensands– A natural softening agent (glaucanite) that can be used in water softeners in place of synthetic mineral resins to exchange sodium ions with the calcium and magnesium hardness in water.

Greige (gray)– Pertaining to fabric produced by weaving or knitting prior to dyeing, bleaching, or finishing. It usually contains sizing or other finishes that are subsequently removed.

Gum– A sticky, viscous, water-soluble substance exuded from various trees and plants. The substance hardens when exposed to air.

Hand– The feel of fabrics such as soft, harsh, or boardy.

Hazardous Soils– Soils that require special precautions in processing. Dangers may include poisonous compounds, microorganism contamination, flammable components, environmental risks, etc.

HCS– OSHA's Hazard Communication Standard. Provides workers the “right-to-know” the hazards and identities of the chemicals they are exposed to in the work-place.

Heat-set– The stabilization of synthetic fabrics to prevent change in size or shape.

Heavy Metals– A wastewater term referring to content of high mass metals such as cadmium, lead, mercury, and zinc

Hemoglobin– The pigment of blood. It contains 0.4% iron and is a common source of staining.

Hexane Extractibles– A wastewater term referring to the content of organic materials that will transfer to hexane when a mixture of hexane and the wastewater are shaken together (extraction).

High tenacity– Referring to yarn of high strength.

Highlight– A lustrous or shiny area appearing on the surface of a starched fabric.

HLB– An empirical ratio called the hydrophile/lipophile balance developed as a measure of the relationship between the two parts of the surfactant molecule.

Humidity– The amount of moisture in the atmosphere.

Humidity (relative)– The percentage of moisture in the air as compared with the total amount of moisture that the air can hold at the same temperature.

Hydantoin– An organic compound used in the production of certain organic dry bleaches. In general, they have low solubility in water but are very effective bleaching agents once dissolved. The most popular is 1,3-dichloro-5,5 dimethyl hydantoin.

Hydrate– To combine with water. Also, a chemical compound formed by the union of water with some other substance.

Hydraulic Press– A method of reducing moisture content in washed goods. Commonly used in place of an extractor for tunnel installations.

Hydrocellulose– Partially hydrolyzed cellulose produced by chemical reaction with acid. Such as found in acid damaged cotton.

Hydrofluoric Acid– HF A very dangerous acid as skin contact can be fatal. Effective as a neutralizer of alkalinity and has excellent rust removing properties. Commercial rust removing agents may contain hydrofluoric acid and special buffering agents.

Hydrogen– A colorless, odorless, tasteless gas; flammable and lighter than any other known substance.

Hydrogenation– A process in which hydrogen is added to the unsaturated portion of fats or oils to make them more solid and resistant to oxidation.

Hydrolases– The most widely used detergent enzymes. Catalyze the decomposition of soils based on proteins, lipids and polysaccharides such as starch.

Hydrolysis– 1. Reaction of a salt with water to form an acid and base. 2. Decomposition of organic compounds by interaction with water in the presence of alkalis or acids or in some cases water alone.

Hydrophile/Lipophile Balance– See HLB

Hydrophilic– Water loving. Refers to the end of the surfactant molecule that is attracted to water. Tends to be repelled by oil (lipophobic or oleophobic - oil hating).

Hydrophobic– Water hating. Refers to the end of the surfactant molecule that is attracted to oil (lipophilic or oleophilic - oil loving).

Hydrotrope– Substances that act as solubilizers and coupling agents for otherwise incompatible materials. They help overcome turbidity or stratification in aqueous solutions containing a sparingly soluble oil or solid. They also act as cloud point depressors for light-duty liquids. Examples are sodium or potassium toluene sulfonate.

Hydroxide– Refers to a chemical containing the hydroxide anion (OH^-).

Hydroxide Anion OH^- – the strongest form of alkali that can be present in a water solution. May come directly from the dissolving of alkalis such as sodium hydroxide (NaOH) or indirectly from alkaline salts such as sodium orthosilicate.

Hygienic– Pertaining to the preservation of health. It requires sanitary conditions.

Hygienically clean– Although not a precise definition, one that has received acceptance is merchandise free of microorganisms in quantities capable of causing disease.

Hygroscopic– Capable of absorbing atmospheric moisture readily.

Hymolal salt– The sulfated fatty alcohols derived from the higher chain alcohols and having soap-like properties.

Hypochlorite– The active bleaching ion (OCl^-) in chlorine bleach oxidation chemistry.

A compound that contains the hypochlorite anion. Most common form is a liquid solution of sodium hypochlorite (NaOCl) other examples include solid Lithium hypochlorite (LiOCl).

Hypochlorous Acid– HOCl The acid formed in acid solutions of the hypochlorite ion.

Inactive Alkalinity– Alkalinity that titrates below a pH of 8.3

Inkers– Term that refers to printers towels heavily laden with inks (and solvents).

In vitro– Referring to the testing of antibacterial properties “in glass,” as in test tubes, with no interfering material present.

In vivo– Testing of antibacterial properties as “in life” usage, in which practical contaminants and denaturants are present.

Industrial clothing (fabrics)– Clothing for wear in industry rather than for apparel and household use.

Infection– Invasion by pathogenic organisms that multiply and cause disease.

Infection-control chemicals– Any chemicals used to prevent cross-infection.

Infectious– Having the ability to transmit disease.

Insoluble– Incapable of being dissolved.

Insoluble Precipitates– Solids that form from a solution that cannot be redissolved without changing the solution chemistry or temperature.

Interfacial tension– The surface tension existing between two liquids or a solid and liquid that keeps the liquids from mixing or a liquid from spreading on a solid. Soap lowers the interfacial tension between water and some soils and thus allows the soil to be flushed away.

Intermediate Extraction– An extraction step other than the final extraction and occurs between two steps in the washing formula to remove more of the wash liquor than would be removed by a drain only step.

Ion Exchange Resins– Materials used in base exchange water softener to replace calcium and magnesium hardness ions with sodium ions. See Zeolite and Greensands.

Iridescent– Pertaining to fabrics having contrasting colored warp and filling.

KDCC– See cyanuric acid. Potassium dichloroisocyanurate.

Keratin– Principal constituent of cuticle, hair, hoofs, and feathers. Very rich in sulfur.

Kier– A mechanical device in which cotton fiber or fabrics are boiled out to remove the natural impurities.

Kier boil– A treatment for the removal of deep-seated stains. The fabrics are boiled in a solution of alkaline detergent and soap

in an open tank, preferably provided with a steam injector for continuous circulation.

Laminated– *Pertaining to fabrics composed of layers of cloth joined together with resin.*

Latent alkalinity– *Alkalinity present in the water supply.*

Lecithin– *An organic fatty material containing nitrogen and phosphorous found in practically all animal tissues and in some vegetable matter, chiefly the seeds.*

Level– *The height of the water or solvent inside the cylinder of the washwheel when the machine is loaded and in motion.*

Liberate– *To set free, as to liberate chlorine or oxygen in bleaching.*

Lime– *Calcium oxide or hydroxide.*

Lime Soap– *See Calcium Soap.*

Lime Soap Dispersers– *Chemicals that react with lime soaps and allow them to be removed.*

Linear Alcohol Ethoxylates– *A class of nonionic surfactants. The word linear indicates a more readily biodegradable version of the surfactant.*

Linear Alkyl Sulfonate– *A class of synthetic anionic surfactants (LAS). The word linear indicates a more readily biodegradable version of the surfactant.*

Lint– *Short fiber produced and loosened by mechanical action or the action of chemicals in the cleaning process.*

Lipase– *A class of enzymes that catalyze the decomposition of fats.*

Lipids– *Group of organic compounds that include fats, esters, fatty acids, soaps, waxes, and other compounds with similar properties.*

Lipophilic– *See hydrophobic*

Lithium Hypochlorite– LiOCl *A relatively stable dry form of inorganic hypochlorite bleach.*

Low Intensity– *A mild process such as a washing formula with reduced chemical or mechanical action.*

Lubricant– *A material added to some laundry products to help keep washer doors from sticking and/or to make fabrics easier to process during ironing.*

Luster– *The shine occurring on or imparted to fibers, yarns, or finished fabrics.*

Material Safety Data Sheets– *See MSDS*

Matrix Fiber– *A manufactured fiber formed by combining two or more generic classes of polymers in a matrix-fibril configuration at the time the fiber is extruded.*

Membrane– *A thin wall usually of animal or vegetable tissue. Also includes synthetic film walls. Semi porous ones may be used in filtration and purification.*

Mercerizing– *A process in which cotton yarns are held under tension while being passed through a caustic soda solution. The resulting yarn is strong and lustrous.*

Metallic Ions– *Positively charged ions formed by removing electrons from neutral metal ions. e.g. Fe^{+++} formed from Fe by removing (oxidation) three electrons.*

Metasilicate– *Salt of the acid H_2SiO_3 . Usually refers to the compound sodium metasilicate (Na_2SiO_3).*

Micelle– *A special grouping of a number of molecules of a chemical substance, such as detergent, held loosely together by chemical bonds.*

Microfiber– *A fabric or yarn made from very small fibers in which the individual fiber size is less than one denier.*

Mil– *A unit, 1/1000 inch, used for measuring the diameter of textile fibers.*

Mild charge– *Low concentration of detergent in dry cleaning solvent; usually one-half to two percent.*

Mildewcide– *A chemical agent that is able to kill mildew-forming organisms.*

Mildistats– *A chemical agent that is capable of retarding the growth of mildew.*

Mileage (solvent)– *The number of lbs of clothing that can be cleaned with one gallon of solvent.*

Mineral Resins– *Synthetic zeolites used in the base exchange method of water softening.*

Mineral spirits– *petroleum solvent.*

Modified Starch– *Natural starches in a form that can be added “dry to the wheel”. These products have been chemically modified or pre-gelatinized for rapid dispersion in water.*

Moire– *Fabrics having a grain or wood effect produced during finishing.*

Moisture retention– *Amount of moisture, usually expressed as a percentage of textile dry weight, that a load of laundry retains before or after a processing operation.*

Montmorillonite– Bentonite clay that can function as a soil suspender and a dye scavenger.

Monofilament– A single-filament yarn.

Mordant– A chemical agent applied to a textile fiber to improve the affinity of a certain dye for the fiber and make the color fast.

Mote– A small impurity that may occur in cotton yarn, such as a speck of cotton seed or other impurity from the cotton plant.

Moth repellent– Chemically treated to resist moth damage. Also, a chemical compound for treating fabric, usually wool, to render it moth repellent

MSDS– Material Safety Data Sheet. Under the provisions of OSHA's Hazard Communication Standard, Material Safety Data Sheets (MSDSs) must be readily accessible to employees when they are in their work areas during their work shifts. As long as employees can get information when it is needed, employers can take different approaches to providing the information such as keeping the MSDSs in a binder in a central location or providing it in electronic format and making it available at computer terminals. In addition, MSDSs must be readily available to emergency personnel in the event of fire or other emergency. See Chapter X for more details.

Muck (filter)– The combination of insoluble soil, used solvent, and filter powder that is removed from the bags, screens, or tubes of a filter. Also called sludge.

Muriatic acid– The commercial name for hydrochloric acid.

Muslin– A firm, plain, white cotton fabric used largely for sheeting.

NaDCC– See cyanuric acid. Sodium dichloroisocyanurate.

Nano Filtration– A membrane treatment process that falls between reverse osmosis and ultra filtration on the filtration/separation spectrum.

Nap– Fiber ends lifted from the body of a fabric to produce a soft, downy surface.

Net– A porous bag, usually constructed of cotton or nylon, to contain garments during the cleaning process.

Neutralization– A chemical reaction in which a given quantity of an acid, either mineral or organic, reacts with a chemically equivalent amount of alkali to form water and a salt.

Neutralizing– The result of mixing equal quantities of acid and alkali. Produces water and a salt. Also the basis for conducting alkali titrations.

NFPA– National Fire Protection Association. The NFPA codes are an approved method of rating the hazard level of chemicals.

Nitric Acid– HNO_3 A strong acid that is corrosive to most metals.

NOBS– Sodium nonanoyl-oxybenzene-sulphonate. Used in the United States as a bleach activator with Peroxygen Bleaches.

NOG– See COG. Not our goods.

Nomenclature– A system of assigning chemical names following a precise set of rules.

Nonionic– A class of surfactants that produce no charged active ingredients when dissolved in water.

Nonpathogenic– Not capable of producing disease.

Nontoxic– Not poisonous; not capable of producing injury or disease.

Nonwoven– A fabric produced directly from fibers matted together instead of being spun or woven.

Nonylphenol Ethoxylates– A class of nonionic surfactants.

NTA– Nitrilotriacetic acid. A strong sequestering agent for metal ions.

Nutrient– A nutritious chemical element or compound; as an example, phosphate or nitrate absorbed by plants to promote growth.

Occluded– To shut in or out.

Off Gas– For a solid or liquid solution to release gas.

Oily Surfactant Complex– A soil suspending structure consisting of oily soil surrounded by surfactant molecules.

Olefin– One of the fiber generic names defined by FTC. Olefin includes several polymer structures, the most common being polyethylene and polypropylene.

Oleophilic– Oil loving. See hydrophobic.

One-bath system– A dry cleaning procedure employing low concentration of detergent in which garments receive a single wash with no rinse. This is also referred to as a single-bath system.

One-shot– A built soap or built synthetic detergent that is added to the washwheel, usually in a single dosage.

Opacifier– A substance that imparts a white, uniform creaminess or lotion effect to a liquid detergent mixture.

Optical brightener– A type of dye that enhances the brightness of certain fibers by converting invisible ultraviolet light to visible light. Common ingredients in almost all manufactured or compounded laundry products. Frequently added to some fibers during manufacture.

Orthosilicate– Usually refers to sodium orthosilicate (Na_4SiO_4). Made by combining metasilicate and caustic.

Overweight Load– Load in which the equivalent amount of clean dry fabric exceeds wash load recommendations.

Oxalic Acid– HOCCOOH Used as a rust-removing agent. Must be thoroughly rinsed because residue can damage cellulose fibers such as cotton.

Oxides– Refers to a general class of compounds made from chemically combining an element with oxygen.

Oxidizing– Refers to the oxidation process. Removal of electrons from a substance. Opposite of reducing.

Oxidizing Bleach– Bleaches that decolorize by the removal of electrons from stains and dyes.

Oxycellulose– An oxidized (damaged) form of cellulose caused by reaction with oxidizing agents. Such as cotton damaged by improper bleaching.

Oxygen Scavengers– Chemical agents that combine with dissolved oxygen.

Ozone– A highly active form of oxygen containing three atoms per molecule instead of the usual two. It is usually formed by a silent electrical discharge in the air and is used as an oxidizing and deodorizing agent in the purification of water.

Package dye– To dye yarn wound on perforated spools or tubes placed in a special dyeing machine containing the dye liquor. Also a small container of concentrated dye.

Package plant– A plant doing a complete cleaning service with all work done on the premises.

Pad– To impregnate fabric with dye liquor or other liquid by squeezing between rolls. Also, to impregnate with liquid for a special purpose, as to pad mops with a dust control oil.

Pad dye– To dye fabric by first passing it through a trough containing the dye and then squeezing it between rollers to remove the excess.

Particulate Soil Removal– Process of removing small insoluble solid particles that may be trapped in a fabric structure.

Pastel– Pertaining to light shades of color.

Pathogen– Microorganisms capable of causing disease.

Pathogenic– Capable of causing disease.

Pathogens– Substances, usually microorganisms, capable of causing disease.

Pearl ash– Common name for potassium carbonate. It is an alkali that absorbs moisture from the air readily and has approximately 77% of the neutralizing power of soda ash, which it resembles.

Penetrate/penetrating agent– To wet out a fiber completely. A surfactant can be considered a penetrating agent.

Pentahydrate– A chemical substance that contains as part of the molecular structure five molecules of water.

Peracetic Acid– CH_3COOOH A form of acetic acid containing an additional oxygen atom. May be used as an oxygen based bleaching agent.

Percalé– A closely woven fabric, either white or colored, principally used for dresses, shirts, and sheets.

Perchloroethylene– Tetrachloroethylene (Cl_2CCl_2). Popular dry cleaning solvent.

Periphyton– A plant found in water whose excessive growth contributes to eutrophication

Permanent finish– A finish applied to fabric that retains its specific properties throughout the normal period of wear and maintenance.

Permanganate (potassium)– A strong oxidizing agent frequently used in stain removal.

Permeable– Able to be penetrated by fluids or gases.

Peroxygen Oxidizer– See oxidizer. A chemical agent that causes a loss of electrons based upon the nature of the oxygen atoms in the agent.

Persalts– A class of inorganic compounds that can produce hydrogen peroxide when dissolved in water.

Perspiration– A body of excretion containing salt, albumin, fatty acids, and other constituents. It may be acid or alkaline depending upon varying conditions.

Petri dish– A round glass or plastic dish with a cover used for growing bacteria.

Petroleum solvent– Flammable dry cleaning solvent derived from petroleum products. two main types are in use: 140°F, and Stoddard solvent with a flash point of at least 100°F.

pH– The term applied to a scale of values designating the degree of the acidity or alkalinity of a solution. The pH scale runs from 0 to 14 with 7 representing a neutral state. Values greater than 7 are alkaline. Values less than 7 are acidic.

Pharmaceutical– Pertaining to drug or medicinal uses. A pharmaceutical grade of chemical is suited to pharmaceutical use.

Phosphates– A class of compounds and metallic salts containing both phosphorous (P) and oxygen (O).

Photometer– An optical instrument for measuring the light reflectance of surfaces. Used in determining whiteness, soil removal, and color fading for laboratory control of cleaning formulas.

Physical– Pertaining to any properties or forces not chemical.

Pick– One filling thread on the loom or in the finished fabric.

Pigment– Finely divided insoluble colored substance that imparts color to a substance such as paint.

Pile– A fabric made with yarns or fibers that stand upright from the main body of the material, such as velvet. These may be looped as in terry.

Pill– A small ball of fibers on the surface of a fabric caused by abrasion and wear.

Pine oil– A byproduct of the steam distillation of pine stumps in the manufacture of turpentine and rosin. It is used as a solvent and deodorant.

PLC– Computer term meaning program logic controller.

Pliability of the Finish– Relates to the ability of a finish such as starch to be able to bend rather than cracking and flaking off.

Ply– Yarn formed by twisting together two or more single strands or threads.

Polyester's Scavenger Nature– Polyester is oleophilic and has a tendency to attract and absorb suspended oily soils from the wash liquor.

Polyethylene– A plastic film of high molecular weight, polymerized ethylene produced by polymerization at high pressure. It is translucent, is the lightest of all plastics, and remains tough and flexible even at low temperatures.

Polymer– The molecular chain-like structure from which resins and synthetic fibers are produced by the linking together of molecular units called monomers.

Polymerize– To link molecules together to form a polymer.

Polysaccharides– A class of complex natural carbohydrates including starch and cellulose of the general formula $(C_6H_{10}O_5)_n$ in which n is a large number.

Polyvinyl Acetate Polymer– A synthetic sizing material that has been used as a starch substitute for synthetic fiber fabrics. Has a tendency to accumulate and cause problems.

Polyvinyl Alcohol– A synthetic finishing and sizing material that is more soluble and less stiff than polyvinyl acetate. Can also be used as a nondurable soil release finish.

Pony washer– Any small washwheel. Usually used for special pieces or small lots needing careful treatment.

Poplin– A ribbed fabric, usually cotton.

Pore– The opening or space between yarns in a fabric that produces “breathing” properties. Also may refer to spaces between fibers in yarns.

Porous (porosity)– Having minute openings that permit the passage of air or liquid through a material.

Post-cure– The application of heat to set permanent press resins after the garment has been completely manufactured.

Potash– Common term for potassium and its compounds.

Potassium dichloroisocyanuric Acid– See cyanuric acid. KDCC.

Potassium hydroxide (KOH)– A strongly alkaline chemical used chiefly for making soap and as a reagent in chemical titrations.

Potassium Orthosilicate– K_4SiO_4 See orthosilicate. Potassium variation of the sodium compound that is more freeze resistant.

Potassium Permanganate– $KMnO_4$ Strong oxidizer used in stain and dye removal. Water solution is dark purple and may leave a brown residue of MnO_2 after oxidation of the stain.

POTW– Publicly Owned Treatment Works. Waste water processing facility in most cities.

PPE– Personal Protective Equipment

ppm– Parts per million. One milligram per liter. 0.0584 grains per US gallon. A unit used to express concentrations of dilute solutions.

Precipitate– To separate, as a solid from a liquid. Also refers to a solid substance separated from a liquid.

Pre-shrunk– Term used to describe fabrics or garments that have been subjected to a shrinking process before being placed on the market.

Pre-spot– To apply a cleaning or spotting compound to fabric spots or stains before cleaning.

Pressure (detergent or alkaline)– The total amount of alkali present for detergent use.

Primary treatment– First stage of sewage treatment that involves settling out larger suspended solids by screening and sedimentation before discharge for further treatment.

Print– A general term for fabric with designs from dyes applied by engraved rollers, wood block, or screens.

Proprietary Chemicals– Formulated chemicals containing an unspecified recipe of generic chemicals. Sold by brand or trade names. Hazardous contents but not per- cent composition are indicated on MSDSs.

Propylene Oxide with a Fatty Alcohol– A class of nonionic surfactant.

Proteases– A class of enzymes that catalyze the decomposition of proteins.

Proteinaceous Stains– Stains that contain natural proteins.

Pure finish– Finish in which no sizing or treatment is added to the fabric.

Pyrophosphate– One of several complex phosphates that have been used as builders in laundry detergents.

Quality control– Testing and inspecting materials during manufacture or processing to assure conformance to quality standards.

Quaternary Ammonium Surfactants– A class of positively charged surfactants derived from ammonia consisting of a nitrogen (N) atom surrounded by four alkyl groups. Some are used as fabric softeners, others as bacteriostats and bacteriocides.

Quaternary Germicides– See Quaternary Ammonium surfactants. Effective at killing many types of bacteria.

Quaternary Nitrogen Compounds– See Quaternary Ammonium surfactants.

Quats– See Quaternary Ammonium surfactants.

Rancid– Natural decomposition of natural fats to produce foul tastes and odors.

Reagent– Any substance used in a chemical reaction to detect, measure, examine, or produce other substances.

Reclaim– To recover for further use, as stained fabrics in a laundry. Also, to recover solvent from dry cleaning garments by condensing the vapors driven off during drying. Also, recovering wash water for treatment and/or subsequent use.

Redeposition– Process by which soil that has been removed in washing fails to be adequately suspended and redeposits on the fabric.

Red Litmus Paper– A test paper for determining the presence of alkaline solutions. Changes from red to blue in alkaline conditions.

Reducing– Refers to the reduction process. Addition of electrons to a substance. Opposite of oxidizing.

Reducing Bleach– Bleaches that decolorize by the addition of electrons to dyes and stains.

Reduction– Addition of electrons to a substance. Opposite of oxidation.

Relative humidity (solvent)– The amount of moisture present in dry cleaning solvent expressed as a percentage of the maximum amount that the solvent could contain at the same temperature and pressure.

Repel– To force away from or prevent from mixing with or adhering to as a chemical agent to repel soil from fabrics.

Repellent– A chemical or substance that repels.

Residue– The non-distillable matter remaining behind after solvent distillation.

Resilient– Referring to the ability of fabrics to withstand crushing or creasing without objectionable change in appearance or shape.

Reverse Surfactants– See amphoteric. Detergents that can function in soil removal and soil suspension during the cleaning process and then reverse those properties to aid in wastewater treatment.

Rinse– High water-level bath or baths following the bleach and preceding the sour or finishing bath. During rinsing the final portions of loosened soil are removed along with the bulk of the washing compounds used in laundering.

Rinse solvent– Solvent used for rinsing garments.

Rosin– An acidic material obtained from coniferous or pine trees; sometimes used to extend soap.

Rosin soap– A soap made from rosin-containing material.

Salt– Chemically, the product of the reaction between an acid and a base. Also, sodium chloride (common table salt, brine).

Sanforizing– The trademark for a patented process for pre-shrinking cotton fabrics by controlled compression during manufacture. Articles made from properly sanforized cloth are not subject to appreciable shrinkage.

Saponification– Alkaline hydrolysis of an oil or fat, or the neutralization of a fatty acid to form a soap.

Saturate– To charge or furnish with something to the point at which no more can be absorbed, dissolved, or retained.

Scour– To clean fibers or fabric to remove such impurities as sizing, oil, and dirt in preparation for dyeing or bleaching.

Seawater Detergents– Detergents that are resistant to hard water and can be used with some success in hard water conditions such as with seawater.

Secondary infection– A super-imposed infection occurring in a host who is already suffering from an earlier infection.

Secondary treatment– The biological treatment of sewage wastes following primary treatment by sedimentation.

Sediment– A water treatment term that refers to particles large enough to settle out from the water.

Selvage– The natural edge of a woven fabric finished so that it will not travel. It always runs parallel to the warp threads.

Semi-colloid– A particle having only partial colloidal characteristics.

Semi-permeable– Refers to a membrane for filtration that allows some substances to pass through and removes other substances.

Sepsis– Poisoning caused by absorption into the blood of pathogenic microorganisms.

Septic– Causing sepsis or putrefaction; infective.

Sequester– A chemical process in which a soluble complex is formed that prevents the normal reaction of certain chemical species, for example, the action of water hardness ions is sequestered by complex phosphates.

Shakeout– To straighten out cleaned goods prior to finishing.

Shelf Life– A term that indicates how long a chemical can be stored and still maintain all of its active properties.

Shrinkage– The contraction and increase in density of fibers and yarns causing a change in shape and size of textile fabrics. Moisture, sudden temperature changes, fabric design, and mechanical and chemical actions promote shrinkage.

Silica– A substance known chemically as silicon dioxide; sand is representative of silica.

Silicated Alkalies– A class of alkaline builders that contain one or more units of SiO_2 .

Silt– A very fine suspension of mineral matter, usually found in water.

Silver nitrate– A corrosive chemical that causes black silver stains on textiles.

Sizing– Starch or synthetic polymer added to fabric to increase the firmness or crispness of the fabric.

Slippage– A form of textile damage that results when one set of threads slips over the opposite set. Smooth natural fibers, yarns possessing little twist, fancy weaves (floats), and wear are common causes of slippage.

Slub– A thick place in a yarn that produces an irregularity in the fabric. Filling yarns are sometimes slubbed purposely to give an irregular ribbed effect to the fabric.

Sludge– See muck. Also a concentrate in the form of semi-liquid mass deposited as a result of the treatment of sewage and industrial wastes.

Snap– The quality of a finished fabric when it possesses luster, uniformity, and unimpaired whiteness.

Soap Scum– Solid residue produced from the reaction of soap with hard or acidic water. e.g., Bath tub ring.

Soap Specks– Solid spots of lime soap on the fabric from the reaction of hard water with soap.

Sodium Alkylbenzene Sulfonate– ABS A class of anionic surfactants used for textile cleaning.

Sodium Bisulfite– NaHSO_3 A reducing agent used as a reducing bleach, antichlor, dye stripper, etc.

Sodium Dichloroisocyanurate– See cyanuric acid. NaDCC.

Sodium Hexametaphosphate– One of several complex phosphates that have been used as builders in laundry detergents.

Sodium Hydrosulfite– Sodium hyposulfite ($\text{Na}_2\text{S}_2\text{O}_4$). A reducing agent used as a reducing bleach, antichlor, and dye fixer.

Sodium hydroxide (NaOH) – A strongly alkaline compound used in making soaps and alkaline builders.

Sodium Hypochlorite– Refers to a solution of NaOCl used as an oxidizing bleach.

Sodium Perborate– NaBO_3 A dry solid used as an oxygen based bleach.

Sodium Percarbonate– A dry solid used as an oxygen based bleach. Can be considered as sodium carbonate hydrated with hydrogen peroxide. More soluble and faster acting than sodium perborate.

Sodium Silicofluoride– Sodium fluosilicate (Na_2SiF_6). A common dry laundry sour.

Sodium Stearate– Common soap made from caustic and animal fat.

Sodium Thiosulfate– $\text{Na}_2\text{S}_2\text{O}_3$ Reducing agent used as a reducing bleach and antichlor.

Soil release– A finish applied to textiles designed to provide easy removal of subsequently applied soil.

Soil repellent– See soil retardant.

Soil retardant– Treated to resist soiling. Also, a chemical substance that, when applied to fabric, will enable it to resist soiling.

Solidification– Process of a substance changing from the liquid or gas state to a solid. Usually by lowering temperature as in freezing.

Soluble– Capable of being dissolved in water or solvent.

Solvent– A substance, usually liquid, capable of dissolving other substances. It is the name usually given to the liquid used for dry cleaning garments.

Solvent (140°F)– See petroleum solvent.

Solvent Fumes– Vapor given off by solvent. Can present a safety problem in terms of flammability and health risk.

Solvent retention– Amount of solvent that a load of dry cleaning retains after cleaning and extraction.

Sour– An acidic agent used in the final bath of the laundering process to neutralize the last traces of alkali from soaps and builders left in fabrics from previous steps in the process.

Sour bath– Normally the final bath in the laundering process. The purpose of the sour (or acid) bath is to neutralize the alkalinity of the water in the textiles before removing them from the machine for finishing.

Specific gravity– The ratio of the weight of a definite volume of a given substance to the weight of an equal volume of water. Temperature must be specified.

Spinneret– A corrosion-resistant disc containing from one to hundreds of tiny holes through which polymers or prepolymers are extruded to form fibers.

Split rinse– A rinse of moderate temperature obtained by completely opening both hot and cold water supply valves at the same time.

Spore– A class of microorganism monitored in the laboratory evaluation of “hygienically clean”.

Spun Poly– Fabric containing yarns made from textured staple-length polyester fibers.

Squeeze roll– A mechanical device for applying pressure to squeeze out liquid.

SS– Suspended solid. A wastewater term referring to the amount of solid material in suspension.

Staple– The average length of a raw textile fiber that is twisted into a yarn. It may vary from one-half inch as in the case of cheaper cottons to many miles in length as in the case of rayon filaments. In general, when comparing natural fibers to the same type, the longer staple is of higher quality and is stronger.

Starch lubricant– An oily or waxy material added to starch to increase flexibility.

Static electricity– An electrical charge generated by rubbing unlike bodies together.

Steam sweep– The injection of wet steam to the still, just above the liquid solvent level to help flush out the solvent vapors.

Stearic Acid– An 18 carbon organic acid commonly found in animal fats. Used to make soap.

Stearine– A glycerine composed of a stearic acid and glycerine. When tallow cools from a melted condition, stearine is the first material to solidify.

Sterile– Free of living organisms.

Stock solution– A solution of laundry or dry cleaning supplies prepared in concentrated form for later convenient use.

Stop spot– To spray, splash, or pour a soil-spotting compound on apparently heavy or tenacious soil stains prior to cleaning.

Straight soap– Commercially pure soap containing at least 88% anhydrous soap.

Streak– A stain taking the form of a line on a dry cleaned garment caused by the non-volatile residue in highly contaminated solvent.

Strength, breaking– See tensile strength. The force required to cause fabric breakage.

Strip– To remove dyes or stains from fabric by use of a chemical reducing agent.

Stripper (stripping agent)– The agent used to strip dyes or stains from fabrics.

Strong charge– High concentration of detergent in dry cleaning solvent, usually about 4%.

Substantive– Self-combining or adhering tenaciously, as a dye substantive to cotton.

Suds– A bath occurring between the break and bleach bath. Suds baths are carried out at low water levels, usually with hot or tempered water. If alkali or detergent isn't added on these additional suds baths, they are referred to as carryover suds.

Suds carryover– See suds.

Sulfated Fatty Alcohols– A class of anionic surfactants.

Sulfated Nonionics– A class of anionic surfactants.

Sulfur black– A black dye that is fast to washing but very sensitive to chlorine bleach.

Sulfur dioxide– An irritating, gaseous compound of sulfur found frequently in the atmosphere. It is capable of causing dye fading and fabric tendering when in contact with moisture.

Sulfur dye– A type of dye having sulfur in its basic structure; has poor bleach resistance.

Sulfonated Amides– A class of anionic surfactants. Resistant to salt and used as seawater detergents.

Sulfonation– Introduction of the sulfo group $-SO_3H$ into an organic compound (surfactant).

Sunfast– Fabrics colored with dyes that will not fade under normal exposure to sun- light.

Supersaturate– To cause to contain more dissolved matter in a solution than is normally possible. Such solutions are unstable and readily return to the saturated state.

Surface tension– That property of all liquids in which the exposed surface tends to contract to the smallest possible area, namely a sphere. This tendency is greatly reduced by detergents, which aid in the wetting and removal of soil from fabrics.

Surfactant (surface-active agent)– A substance that alters energy relationships at inter- faces, such as wetting agents and foaming agents.

Surfactant/Builder– Term that includes both of the major components of a detergent. Determines the proper use category for the detergent.

Suspended solids (SS)– Small particles of solid pollutants in sewage that contribute to turbidity and that resist separation by conventional means. The examination of suspended solids and the BOD test constitute the two main determinations for water quality performed at wastewater treatment facilities.

Swale– A satin that exhibits a wavy outline.

Syndet– Shortened form of synthetic detergent.

Synthetic detergent– A surface-active material made from synthetic organic combls that has cleansing action similar to soap. These detergents may be anionic, cationic, or nonionic, depending on their constitution.

Synthetic solvent– A non-flammable chlorinated or fluorinated dry cleaning solvent such as perchloroethylene.

Synthetic Starch– One of several chemicals such as polyvinyl acetate and polyvinyl alcohol used in place of plant starches. Commonly used for synthetic fiber fabrics.

TAED– Tetra acetyl-ethylene-diamine. Developed in Europe as a bleach activator for Peroxygen Bleaches.

Tallow– Fat obtained by extraction or rendering of solid animal fats.

TCCA– See cyanuric acid. trichloroisocyanuric acid.

Tenacious Soil– Any soil that is very difficult to remove. Tightly held by the fabric.

Tenderize (tender)– To lower the fiber strength of fabric by chemical or mechanical means.

Tensile strength– The measure of the ability of a yarn or fabric to resist breaking.

Tertiary treatment– A phase of wastewater treatment beyond the 85% to 95% BOD removal of the secondary stage by such processes as carbon adsorption, reverse osmosis, ion exchange, and demineralization.

Tetrachloroethylene– See perchloroethylene.

Textile– Textile Products manufactured from fibers. This includes yarn, tread, and most types of fabric.

TFPIA– Textile Fiber Products Identification Act. A US law that applies to most fabrics and requires that fibers be identified using “generic” names for manufactured fibers and “commonly accepted terms” for natural fibers. For manufactured fibers, generic terms are defined based on the structure of the polymer repeating unit.

Thermal Shock– Term that describes the possible setting of wrinkles in heat sensitive fabrics such as polyester when the bath temperature is rapidly changed.

Thermoplastic– Having the property of becoming soft under application of heat, specifically referring to certain synthetic resins and textile fibers.

Thermosetting– Having the property of hardening or setting with heat as do certain plastics or synthetic resins.

Thixotropy– The property of a substance decreasing in viscosity on standing after agitation. This term is encountered mostly in soap stock tanks.

Titanium Dioxide– A common pigment added during the extrusion of manufactured fibers to control luster.

Titanium stripper– A chemical reducing agent containing a compound of titanium used for dye or stain removal.

Titanous chloride ($TiCl_3$)– A compound of titanium and chloride that is an active reducing agent. It is strong enough to remove many dyes and is used as a stain remover.

Titration– A process used to measure the concentration or amount of a chemical present in a solution.

Tolerance– Ability to withstand or endure without ill effects.

Top dye– To add color to a fabric that has already been dyed to produce a greater depth or a change of shade to match the desired standard.

Total fatty acid (T.F.A.)– The total amount of fatty material that is obtained when a sample of fat or fatty acid is completely saponified and, after acidulation, extracted with petroleum ether or ethyl ether.

Tow– A fiber form created during the production of manufactured staple fibers. Tow consists of many continuous filaments from the spinneret in a large rope-like bundle. The spinneret, used for producing tow, will often have as many as 200,000 holes. These tows are crimped and mechanically cut into staple lengths which are used as is or blended with other staple fibers, either natural or manufactured.

Toxicity– Rating assigned to the health effects (including tendency to cause death) by exposure to an agent including inhalation, oral ingestion, and skin exposure.

Translucent– Allowing passage of light, but diffusing it so that objects beyond cannot be clearly seen; in between transparency and opacity.

Trichloroisocyanuric Acid– See cyanuric acid. TCCA.

Tripoly– One of several complex phosphates that have been used as builders in laundry detergents.

Trisodium Phosphate– One of several complex phosphates that have been used as builders in laundry detergents.

Tunnel Washers– General term that includes continuous batch washers in which the basic principle is the movement of the load from section to section as the water moves in the opposite direction,

Turbidity– Water treatment term that refers to small insoluble particles that are dispersed in the water causing cloudiness and are too small to remove by settling.

Two-bath system– A dry cleaning system utilizing two distinct cycles in the cleaning process, one with solvent containing detergent, the other with clear rinse solvent.

Underweight Load– Load in which the equivalent amount of clean dry fabric is less than wash load recommendations.

Vapor– A gas, specially from a substance that is a solid or liquid at ordinary temperature.

Vat dye– An extremely light and wash-fast type of dye applied to fibers in a soluble form by reducing action and then permanently set by oxidizing to its original insoluble form. Used primarily on cotton yarns and fabrics.

Verdigris– A greenish or bluish deposit of copper soap or salts formed on copper, brass, or bronze surfaces.

Viscosity– The resistance to flow exhibited by a liquid product. Viscosity in detergent practice is measured in centipoises, water at room temperature having a viscosity of 1 centipoise. The higher the viscosity, the thicker (less fluid) the product.

Viscous– Possessing or characterized by viscosity.

Volatile– Readily evaporated.

Volatile matter– That portion of a chemical substance that vaporizes below a specified temperature within a specified length of time.

Warp– The heavy yarns running lengthwise (parallel to the selvage) in a fabric and upon which the cross yarns or filling yarns are built.

Wash-and-wear– fabrics or garments treated with a wrinkle-resistant finish allowing them to be washed and used without pressing.

Washing soda– A form of soda ash containing crystallized water within its molecular structure.

Washwheel– A washing machine.

Water conditioning– The treatment of water prior to washing to remove undesirable, suspended, or dissolved matter.

Water repellent– Referring to fabric or garments treated to resist wetting by water without closing the fabric pores. Also, a chemical used to impart water repellency to fabrics.

Water-soluble Soil– Soils that dissolve in water readily and require no additional chemicals for removal.

Waterproof– Referring to fabrics that have been treated in such a manner as to make them impervious to penetration by water. Rubber, oil, or plastic coated fabrics are typical.

Weight– To apply a finish to fabric to give increased weight.

Wet– To cover or saturate with water or solvent.

Wet clean– To clean by washing in water.

Wet-dry– Pertaining to spotting agents that are soluble or miscible and rinseable in both water and dry cleaning solvents.

Wet-side– Pertaining to detergents or spotting agents that are soluble and rinseable in both water and dry cleaning solvents.

Wetting agent/wetting– A material that increases the spreading of a liquid medium on a surface.

Whiteness retention– The whiteness reflectance of a laundered or dry cleaned fabric expressed as a percentage of the original reflectance.

Yarn– The continuous thread-like strand resulting from the spinning operation and used for weaving, knitting, or crocheting.

Yarn count– The number of yarns per inch used in the construction of a fabric.

Zeolite– A hydrous aluminum-sodiumsilicate capable of exchanging sodium for calcium magnesium and other metals. It also has the capability of regenerating (reversing) itself when treated with brine (concentrated sodium chloride solution).

Zero soft water– Sometimes called “zero hardness.” This refers to water that is free from hardness salts.

Zinc Silicofluoride– $ZnSiF_6$ A highly soluble dry laundry sour that may create waste- water issues due to the release of zinc.

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