

**INDUSTRIAL
CHEMICALS
DIVISION**



PQ CORPORATION

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PQ Australia Pty. Ltd.
Phone: 61-3-9708-9200

IN TAIWAN

PQ Silicates Ltd.
Phone: 886-2-2383-0515

PQ Corporation, recently acquired by JPMorgan Partners, is a leading producer of silicate, zeolite, and other performance materials serving the detergent, pulp and paper, chemical, petroleum, catalyst, water treatment, construction, and beverage markets. It is a global enterprise, operating in 19 countries on five continents, and along with its chemical businesses, includes Potters Industries, a wholly owned subsidiary, which is a leading producer of engineered glass materials serving the highway safety, polymer additive, metal finishing, and conductive particle markets.

Bulletin 41-26

Detergent Formulary

PQ Corporation is one of the world's leading manufacturers of soluble silicates. This leadership is based on more than one hundred years of experience in the development and manufacture of a wide variety of sodium and potassium silicates and sodium metasilicates for the soap and detergent industry.

In addition to offering a broad range of products, PQ can supply customers from manufacturing facilities located throughout the United States. To service users of less than truckload quantities, PQ silicates are available from chemical distributors located nationwide.

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DETERGENT FORMULARY

Detergency

In the most basic terms, detergency is the process of removing soil from the surface to which it clings. This definition requires the formulator to consider the following: the nature of the soil to be removed, the substrate or surface to which it clings, the process by which the soil is to be removed, the type of water to be used, and its temperature. The substrate or surface may be fabric, metal, ceramic, glass, masonry, or concrete. The type of soil can be particulate, carbonaceous, or oily.

An effective cleaning compound must perform certain basic functions during the process of soil removal. These functions include: neutralizing acidic soil components, emulsification of oils and greases, deflocculating particulate soil, suspending soil and preventing redeposition.

PQ® sodium and potassium silicates and sodium metasilicates contain optimum proportions of alkali and silica for most cleaning requirements. They scatter grease and dirt deposits into small, suspended particles which rinse away without redepositing on freshly washed surfaces.



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The use of sodium and potassium silicates and sodium metasilicate improves soil suspension so that the cleaned material does not act as a "filter" when the wash water is drained. The silica content also moderates the alkali's tendency to corrode sensitive metals. Silica contributes substantially to the unique buffering action of the metasilicates. It enables them to maintain effective pH levels during cleaning operations despite sudden and heavy introduction of acidic soils. Initial supplies last longer in the detergent bath, whereas an unbuffered alkali quickly loses its strength. This results in a sharp drop-off in pH with the consequent loss in cleaning action.

Silicates increase the effectiveness of surfactants or soaps. A combination of silicates and complex phosphates offers a synergistic effect which results in more effective detergency than corresponding amounts of either component used alone. Moreover, in situations where phosphates are not used, alkaline silicates in combination with VALFOR® synthetic zeolites have proven to be very efficient and cost effective for softening water.

HOW TO USE THIS DOCUMENT

This document provides basic starting formulations for cleansing compounds and detergents. In general, the formulations have been taken from the published literature. We have not tested them, but they appear reasonable and are offered as starting points for those who wish to develop their own compounds.

All recommended percentages are on a weight/weight basis.

To locate a formulation for a particular cleaning application, check the index on page 1.

Products of the PQ Corporation used in the formulations are identified by their trademarks as follows: METSO BEADS® 2048 and METSO PENTABEAD® 20 sodium metasilicate; BRITESIL® hydrous polysilicates; KASIL® potassium silicates; A®2447, D®, N®, and STAR® liquid sodium silicates; G® hydrous sodium silicate powder; PQ® epsom salt; and VALFOR® 100 synthetic zeolite.

CHEMICAL ABBREVIATIONS USED IN THE FORMULATIONS

CMC - Carboxymethylcellulose

EDTA - Ethylenediamine tetra acetic acid

LAS - Linear alkylbenzene sulfonate

STPP - Sodium tripolyphosphate

TKPP - Tetrapotassium pyrophosphate

TSP - Trisodium phosphate, anhydrous

TSPP - Tetrasodium pyrophosphate

Note: The formula ingredients are listed in order of addition. It is recommended that bench-scale quantities of the formulations be made and evaluated before production is initiated. The EO (ethylene oxide) listed for certain ingredients is varied to achieve desired cloud point and foaming characteristics.

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AIRCRAFT AND AUTOMOTIVE CLEANERS (INDUSTRIAL)

Aircraft Cleaner:

METSO PENTABEAD® 20 sodium metasilicate	30%
STPP	30%
Ammonium bifluoride	8%
TSP	20%
Sodium alkyl naphthalene sulfonate	8%
Sodium alkylaryl sulfonate powder (90%)	4%

Carwash—Liquids:

Water	77%
TKPP (60%)	12%
KASIL® #6 potassium silicate	5%
Phosphate ester	1%
C9-C11 linear alcohol, 6 moles EO	5%
Water	62%
TKPP (60%)	15%
STAR® sodium silicate	6%
Sodium xylene sulfonate (40%)	12%
C9-C11 linear alcohol, 6 moles EO	5%

Carwash—Powders:

METSO BEADS® 2048 sodium metasilicate	20%
STPP	40%
TSP	5%
Sodium carbonate	20%
Alkylaryl sulfonate powder	5%
C9-C11 linear alcohol, 6 moles EO	10%
METSO PENTABEAD® 20 sodium metasilicate	30%
STPP	44%
Sodium carbonate	15%
CMC	1%
Octylphenol, 7-8 moles EO	5%
Octylphenol, 5 moles EO	5%

Engine Cleaner:

Sodium carbonate	40%
TSP	20%
C9-C11 linear alcohol, 6 moles EO	15%
METSO PENTABEAD® 20 sodium metasilicate	25%

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Truck Wash—Powders:

METSO PENTABEAD® 20 sodium metasilicate	20%
Sodium carbonate	30%
STPP	35%
Sodium alkylaryl sulfonate	15%
Sodium carbonate	40%
Nonylphenol, 9-10 moles EO	5%
TSP	25%
METSO PENTABEAD® 20 sodium metasilicate	20%
Sodium alkylaryl sulfonate	10%

Whitewall Tire Cleaners:

LIQUIDS:

Water	70%
Potassium hydroxide (45%)	16%
N® Clear sodium silicate	10%
Sodium alkylaryl sulfonate (60%)	2%
C9-C11 linear alcohol, 6 moles EO	2%
Water	74.3%
TSP, anhydrous	4.5%
STAR® sodium silicate	8.0%
Sodium hydroxide (50%)	3.3%
Sodium xylene sulfonate (40%)	6.3%
Sodium alkylaryl sulfonate (60%)	1.6%
C9-C11 linear alcohol, 6 moles EO	2.0%

POWDER:

STPP	45%
C9-C11 linear alcohol, 6 moles EO	5%
TSP	10%
Sodium alkylaryl sulfonate	10%
METSO BEADS® 2048 sodium metasilicate	30%

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FOOD & DAIRY CLEANERS (INDUSTRIAL AND INSTITUTIONAL)

Baking Pan Cleaners:

Sodium carbonate	35%
STPP	12%
Nonylphenol, 9-10 moles EO	3%
METSO PENTABEAD® 20 sodium metasilicate	50%

Dairy Piping Cleaner:

Sodium carbonate	30%
STPP	25%
Triton DF-16	5%
METSO BEADS® 2048 sodium metasilicate	30%
Sodium hydroxide beads	10%

Sodium carbonate	28%
STPP	35%
C12-C15 linear alcohol, 12 moles EO	5%
Alkylaryl sulfonate, acid (98%)	2%
METSO BEADS® 2048 sodium metasilicate	30%

Egg Cleaner:

TSPP	32%
Sodium carbonate	30%
METSO BEADS® 2048 sodium metasilicate	20%
Sodium sulfate	10%
Sodium dichloroisocyanurate 2H ₂ O	3%
Sodium alkylaryl sulfonate	5%

Grill Cleaner:

Water	78.2%
Sodium acrylate (MW 4500-5500)	0.5%
METSO BEADS® 2048 sodium metasilicate	7.9%
TKPP (60%)	3.0%
Phosphate ester	5.4%
Octylphenol, 9-10 moles EO	5.0%

Milk Can Cleaner:

STPP	30%
METSO BEADS® 2048 sodium metasilicate	30%
Sodium carbonate	35%
Sodium dichloroisocyanurate, 2H ₂ O	3%
Sodium alkylaryl sulfonate	2%

Sanitizing Cleaners:

STPP	30%
Sodium carbonate	25%
C12-C16 linear alcohol, 12 moles EO	10%
METSO PENTABEAD® 20 sodium metasilicate	30%
Quaternary germicide	5%
METSO BEADS® 2048 sodium metasilicate	20%
Sodium carbonate	35%
STPP	30%
Sodium dichloroisocyanurate, 2H ₂ O	10%
Sodium alkylaryl sulfonate	5%

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METAL CLEANING (INDUSTRIAL)

Aluminum:

METSO BEADS® 2048 sodium metasilicate	45%
STPP	30%
Sodium bicarbonate	20%
Sodium resinate	3%
Octylphenol, 9-10 moles EO	2%
Water	33%
Potassium hydroxide (45%)	30%
N® Clear sodium silicate	20%
Sodium xylene sulfonate (40%)	12%
Nonylphenol, 9-10 moles EO	3%
Gluconic acid (45%)	2%

Degreaser:

Water	62%
METSO BEADS® 2048 sodium metasilicate	8%
EDTA, tetrasodium (37%)	10%
Phosphate ester	10%
C9-C11 linear alcohol, 6 moles EO	5%
C9-C11 linear alcohol, 2.5 moles EO	5%

Destainer:

STPP	25%
METSO BEADS® 2048 sodium metasilicate	25%
Octylphenol	2%
Sodium sulfate	8%
PQ® Magnesium Sulfate	2%
Sodium perborate, monohydrate	38%

Ferrous Metals—Immersion:

LIQUID—LIGHT DUTY:

Water	49%
Potassium hydroxide (45%)	12%
METSO BEADS® 2048 sodium metasilicate	12%
TKPP (60%)	12%
Sodium xylene sulfonate (40%)	12%
Nonylphenol, 11-13 moles EO	3%

POWDER—HEAVY DUTY:

Sodium carbonate	22%
TSP	10%
Nonylphenol, 11-13 moles EO	3%
Sodium gluconate	5%
METSO BEADS® 2048 sodium metasilicate	20%
Sodium hydroxide beads	40%

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POWDER—MEDIUM DUTY:

Sodium carbonate	40%
TSP	16%
Nonylphenol, 11-13 moles EO	4%
METSO BEADS® 2048 sodium metasilicate	14%
Sodium lignosulfonate	4%
Sodium hydroxide beads	22%

POWDER—LIGHT DUTY:

Sodium carbonate	45%
STPP	25%
Nonylphenol, 11-13 moles EO	5%
METSO BEADS® 2048 sodium metasilicate	25%

Ferrous Metals—Spray:

LIQUID—LIGHT DUTY

Water	10.0%
Phosphate ester, potassium salt	4.5%
Nonylphenol, 9-11 moles EO	1.0%
Potassium hydroxide (45%)	38.0%
STAR® sodium silicate	45.0%
Gluconic acid (50%)	1.5%

POWDER—LIGHT DUTY

Sodium carbonate	55%
TSPP	11%
C12-C13 linear alcohol, 1 mole EO	2%
C12-C13 linear alcohol, 3 moles EO	2%
METSO PENTABEAD® 20 sodium metasilicate	25%
Sodium gluconate	5%

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HEAVY DUTY CLEANERS (INDUSTRIAL)

CIP Cleaners:

STPP	40%
Sodium carbonate	12%
C12-C13 linear alcohol, 3 moles EO	3%
METSO BEADS® 20 sodium metasilicate	25%
Sodium hydroxide beads	20%

STPP	40%
Sodium carbonate	12%
C12-C13 linear alcohol, 3 moles EO	3%
METSO PENTABEAD® 20 sodium metasilicate	45%

Concrete Cleaners:

STPP	10%
Sodium carbonate	26%
Nonylphenol, 9-10 moles EO	6%
Pine oil	3%
METSO PENTABEAD® 20 sodium metasilicate	55%

TSP	20%
Sodium carbonate	25%
Pine oil	2%
Sodium alkylaryl sulfonate	9%
METSO BEADS® 2048 sodium metasilicate	30%
Sodium hydroxide beads	14%

Fuel Oil Tank Cleaner:

Water	83.0%
METSO PENTABEAD® 20 sodium metasilicate	4.0%
TKPP	2.0%
Sodium xylene sulfonate (40%)	6.0%
Sodium lignosulfonate	1.0%
Octylphenol, 6-7 moles EO	1.5%
Octylphenol, 9-10 moles EO	2.5%

Printing Plant Cleaner:

METSO PENTABEAD® 20 sodium metasilicate	100%
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Usage: 4-6 oz./gal. water

Steam Cleaners:

LIQUIDS:

Water	18.8%
TKPP	17.2%
Potassium hydroxide (45%)	31.3%
Phosphate ester	2.3%
Octylphenol, 7-8 moles EO	0.4%

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Steam Cleaners:

LIQUIDS (Continued):

Water	34.1%
TKPP	17.2%
Potassium hydroxide (45%)	31.1%
Phosphate ester	2.0%
C9-C11 linear alcohol, 6 moles EO	0.4%

POWDERS:

STPP	35%
Sodium carbonate	20%
C9-C10 linear alcohol, 12 moles EO	10%
METSO BEADS® 2048 sodium metasilicate	35%

STPP	50%
C9-C10 linear alcohol, 12 moles EO	3%
Sodium gluconate	2%
METSO PENTABEAD® 20 sodium metasilicate	45%

HARD SURFACE CLEANERS (INDUSTRIAL AND INSTITUTIONAL)

LIQUIDS:

Water	71.4%
TSP	1.6%
Sodium hydroxide (50%)	4.0%
Phosphate ester	5.0%
C9-C11 linear alcohol, 6 moles EO	2.8%
C9-C11 linear alcohol, 2.5 moles EO	1.2%

Water	28%
N® Clear sodium silicate	10%
Sodium hydroxide (50%)	5%
EDTA, tetrasodium (37%)	20%
Sodium xylene sulfonate (40%)	30%
C12-C13 linear alcohol, 6.5 moles EO	7%

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MACHINE DISHWASH DETERGENTS (INSTITUTIONAL)

LIQUIDS:

Water	50.9%
ACUSOL 810 ⁺	6.9%
Triton DF-16*	3.0%
Potassium hydroxide (45%)	1.2%
TKPP (60%)	25.0%
N [®] Clear sodium silicate	13.0%

Water	10%
Potassium hydroxide (45%)	35%
KASIL [®] #1 potassium silicate	30%
TKPP (60%)	20%
Sodium hypochlorite (15%)	5%

POWDERS:

STPP	40%
METSO BEADS [®] 2048 sodium metasilicate	20%
Sodium carbonate	15%
Sodium hydroxide beads	20%
Chlorinated TSP	5%

STPP	40%
Sodium carbonate	24%
C12-C13 linear alcohol, 5 moles EO	6%
METSO PENTABEAD [®] 20 sodium metasilicate	30%

*Dow Chemical ⁺Rohm and Haas Company

LAUNDRY DETERGENTS (INDUSTRIAL AND INSTITUTIONAL)

LIQUIDS—(Dispersions):

Water	69.0%
STPP	17.0%
Potassium hydroxide (45%)	1.6%
KASIL [®] #6 potassium silicate	7.4%
LAS	5.0%

Water	54.5%
TKPP	4.6%
Sodium hydroxide (45%)	4.2%
Potassium hydroxide (45%)	13.7%
Phosphate ester	5.0%
C12-C15 linear alcohol, 9 moles EO	3.0%

Water	28.7%
Fluorescent brightener	0.1%
CMC	0.5%
ACUSOL 810 ⁺	6.0%
Nonylphenol, 9-10 moles EO	10.0%
Potassium hydroxide (45%)	2.2%
TKPP (60%)	40.0%
KASIL [®] #6 potassium silicate	12.5%

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LIQUID—(Solution):

Water	69.0%
Potassium hydroxide (45%)	1.6%
STPP	17.0%
KASIL® #6 potassium silicate	7.4%
LAS	5.0%

POWDERS—Linen Supply:

MODERATE TO HIGH ALKALINITY:

Sodium carbonate	30%
STPP	20%
Nonylphenol, 9-10 moles EO	8%
Sodium sulfate	6%
LAS	4%
METSO BEADS® 2048 sodium metasilicate	30%
CMC	2%

METSO BEADS® 2048 sodium metasilicate	30%
Sodium carbonate	20%
STPP	20%
LAS	12%
CMC	2%
Sodium hydroxide beads	16%

LOW ALKALINITY:

Britesil® H ₂ O hydrous polysilicate	20%
STPP	26%
Sodium carbonate	28%
Nonylphenol, 9-10 moles EO	10%
Sodium sulfate	10%
CMC	2%
LAS	4%

PHOSPHOROUS-FREE:

VALFOR® 100 zeolite A	20%
Sodium carbonate	28%
Sodium polyacrylate (MW 4500-5500)	2%
Nonylphenol, 9-10 moles EO	8%
LAS	4%
METSO BEADS® 2048 sodium metasilicate	36%
CMC	2%

POWDERS—Industrial Supply:

MODERATE ALKALINITY:

Sodium carbonate	20%
STPP	15%
Nonylphenol, 9-10 moles EO	12%
Sodium sulfate	16%
Polyvinylpyrrolidone	1%
CMC	1%
METSO BEADS® 2048 sodium metasilicate	35%

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LOW ALKALINITY:

Britesil® C24 hydrous polysilicate	20%
STPP	16%
Sodium carbonate	20%
Sodium sulfate	30%
Polyvinylpyrrolidone	1%
CMC	1%
Nonylphenol, 9-10 moles EO	12%

PHOSPHOROUS-FREE:

VALFOR® 100 zeolite A	14%
Sodium carbonate	20%
Nonylphenol, 9-10 moles EO	14%
Sodium sulfate	20%
Polyvinylpyrrolidone	1%
CMC	1%
METSO BEADS® 2048 sodium metasilicate	30%

NOTE: An optical brightener is recommended in the above formulations.

LAUNDRY ALKALI BUILDERS (INDUSTRIAL & INSTITUTIONAL)

POWDERS:

HIGH ALKALINITY:

METSO BEADS® 2048 sodium metasilicate	60%
Sodium hydroxide beads	40%
METSO BEADS® 2048 sodium metasilicate	30%
STPP	20%
Sodium carbonate	28%
CMC	2%
Sodium hydroxide beads	20%

MODERATE ALKALINITY:

METSO BEADS® 2048 sodium metasilicate	100%
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LIQUIDS:

LINEN SUPPLY:

N® Clear sodium silicate	62%
Potassium hydroxide (45%)	38%
N® Clear sodium silicate	52%
Potassium hydroxide (flake)	37%
Water	11%
N® Clear sodium silicate	52%
Sodium hydroxide beads	14%
Potassium hydroxide (flake)	28%
Water	6%

INDUSTRIAL SUPPLY:

D® sodium silicate	90%
Water	10%
N® Clear sodium silicate	88%
Sodium hydroxide (50%)	12%

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CORPORATE HEADQUARTERS

PO Box 840
Valley Forge, PA 19482-0840
Phone: 800-944-7411

IN CANADA

National Silicates
Phone: 416-255-7771

IN MEXICO

Silicates y Derivados, S.A.
Phone: 52-555-227-6801

IN EUROPE

PQ Europe
Phone: 31-33-450-9030

IN AUSTRALIA

PQ Australia Pty. Ltd.
Phone: 61-3-9708-9200

IN TAIWAN

PQ Silicates Ltd.
Phone: 886-2-2383-0515

LAUNDRY DETERGENTS (CONSUMER)

DRY BLENDED:

BRITESIL® C24 hydrous polysilicate	20.0%
STPP	30.0%
Sodium carbonate	10.5%
C12-C15 linear alcohol, 7 moles EO	4.0%
Sodium sulfate	24.0%
CMC	1.0%
LAS	10.0%
Optical brightener, Perfume	0.5%

PHOSPHOROUS-FREE:

VALFOR® 100 zeolite A	30.0%
BRITESIL® C24 hydrous polysilicate	7.0%
Sodium carbonate	15.0%
Polyacrylate (MW 4500-5500)	1.0%
C12-C15 linear alcohol, 7 moles EO	4.0%
LAS	10.0%
CMC	1.0%
Optical brightener	0.5%
Sodium sulfate	31.5%

AGGLOMERATED:

STPP	30%
Sodium carbonate	15%
BRITESIL® C24 hydrous polysilicate	10%
Sodium sulfate	31%
LAS	7%
RU® sodium silicate	7%

LOW-PHOSPHOROUS:

(Economy)

VALFOR® 100 zeolite A	20%
Sodium carbonate	25%
STPP	5%
Sodium sulfate	36%
LAS	7%
RU® sodium silicate	7%

(Premium)

VALFOR® 100 zeolite A	27%
STPP	5%
Sodium carbonate	10%
CMC	1%
Sodium sulfate	29%
LAS	12%
C12-C15 linear alcohol, 7 moles EO	6%
RU® sodium silicate	10%

**INDUSTRIAL
CHEMICALS
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PHOSPHOROUS-FREE:

(Economy)

VALFOR® 100 zeolite A	25.0%
Sodium carbonate	25.0%
Sodium sulfate	35.5%
LAS	5.0%
Polyacrylate (MW 4500)	0.5%
C12-C15 linear alcohol, 7 moles EO	2.0%
RU® sodium silicate	7.0%

(Premium)

VALFOR® 100 zeolite A	30.0%
Sodium carbonate	15.0%
CMC	1.0%
Sodium sulfate	22.5%
Polyacrylate (MW 4500)	0.5%
LAS	10.0%
C12-C15 linear alcohol, 7 moles EO	11.0%
RU® sodium silicate	10.0%

LAUNDRY BLEACHES (INDUSTRIAL & INSTITUTIONAL)

CHLORINE BASED:

Lithium hypochlorite	50%
Sodium sulfate	22%
METSO BEADS® 2048 sodium metasilicate	20%
TSPP	8%

Calcium hypochlorite	50%
METSO BEADS® 2048 sodium metasilicate	20%
Sodium chloride	30%

Chlorinated isocyanurate	18%
STPP	10%
METSO BEADS® 2048 sodium metasilicate	10%
Sodium sulfate	62%

OXYGEN BASED:

Sodium percarbonate	60%
METSO BEADS® 2048 sodium metasilicate	20%
Sodium carbonate	20%

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MISCELLANEOUS (INDUSTRIAL & INSTITUTIONAL)

CARPET CLEANERS:

STPP	30.0%
Sodium carbonate	20.0%
Betaine derivative, anionic	2.9%
Sodium sulfate	17.0%
Optical brightener	0.1%
Fragrance	Trace
METSO PENTABEAD® 20 sodium metasilicate	30.0%

LIQUID (SHAMPOO):

Water	62.5%
TSP	2.0%
STPP	5.0%
KASIL® #6 potassium silicate	20.0%
Phosphate ester, anionic	3.0%
Sodium alkylnaphthalene sulfonate	3.5%
Octylphenol, 7-8 moles EO	4.0%

CARPET STEAM CLEANER:

Water	79.6%
METSO BEADS® 2048 sodium metasilicate	7.8%
Sodium xylene sulfonate (40%)	8.7%
C12-C15 linear alcohol, 12 moles EO	3.9%

DISINFECTANT CLEANER (POWDER):

Sodium carbonate	35%
STPP	30%
BRITESIL® H2O hydrous polysilicate	20%
Nonionic surfactant	10%
Germicide (quaternary compound)	5%

DRAIN CLEANER:

Water	71%
Sodium hydroxide (50%)	20%
METSO BEADS® 2048 sodium metasilicate	5%
Nonionic surfactant	4%

PAINT STRIPPERS:

LIQUID:

Water	40%
METSO BEADS® 2048 sodium metasilicate	10%
Biodegradable glucoside anionic	10%
Sodium hydroxide (50%)	40%

POWDER:

METSO PENTABEAD® 20 sodium metasilicate	48%
G® sodium silicate	50%
Sodium resinate	2%

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*METSO BEADS, KASIL and N are registered trademarks of the PQ Corporation.

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WAX STRIPPERS:

LIQUIDS:

Water	38.6%
C12-C15 linear alcohol, 3-4 moles EO	3.0%
ACUSOL 810 ⁺	8.3%
Potassium hydroxide (45%)	3.4%
TKPP (60%)	41.7%
KASIL [®] #6 potassium silicate	5.0%

Water	75%
METSO BEADS [®] 2048 sodium metasilicate	5%
Sodium hydroxide (50%)	1%
Diethanolamine	1%
EDTA, tetrasodium (37%)	6%
Dipropylene glycol monomethyl ether	4%
Phosphate ester	3%
Nonylphenol, 9-10 moles EO	5%

POWDER:

METSO PENTABEAD [®] 20 sodium metasilicate	35%
Sodium carbonate	30%
TSP	20%
Sodium alkylaryl sulfonate	15%

⁺Rohm and Haas Company

MATERIAL SOURCES

For the most complete listing of suppliers of ingredients for cleaner formulations, consult:

Surfactants:

Emulsifiers & Detergents, North American Edition

McCutcheon's Publications
175 Rock Road
Glen Rock, NJ 07451
(201) 652-2655
www.gomc.com

Functional Materials (All Other Ingredients):

Functional Materials

McCutcheon's Publications
(Same as above)

Chemicals-General:

Chemical Week Buyer's Guide

Chemical Week
110 William St.
New York, NY 10038
(212) 621-4900
www.chemweek.com