

METSO® & BRITESIL®

Sodium metasilicate and polysilicate



Advancing the art of silicate chemistry™

Soluble Silicates

SS[®]
SS-C[™]
G[®]
GD[®]

Sodium Silicates – Solids

Available in a variety of weight ratios and particle size distributions.

N[®]
N-CLEAR[™]
RU[™]
O[®]
D[™]

Sodium Silicates – Solutions

Available in a variety of weight ratios and viscosities.

METSO BEADS[®]
METSO
PENTABEAD[®]
BRITESIL[®]

Sodium Metasilicates and Polysilicates

METSO[®] products come in both anhydrous and pentahydrate forms. BRITESIL products are hydrous powders.

KASIL[®]
KASOLV[®]

Potassium Silicates

Available in solids and solutions, as well as flake glass, hydrated, and anhydrous powder forms.

Magnesium Sulfate

PQ[®]
Epsom Salt
MagnaBrite[™]
MagnaGrow[®]
Go Soak Yourself[®]

Magnesium Sulfate Heptahydrate

Available in crystal and liquid solutions.

Advancing the Art of Silicate Chemistry™

PQ first produced soluble silicates for commercial applications more than 160 years ago and has been advancing the art of silicate chemistry ever since. Simply stated, PQ is silicate chemistry.

Over the years, PQ has grown from a family soap and candle business into the world's leading manufacturer of silicates and silica-based inorganic chemicals and the world's largest volume producer of sodium silicates, synthetic zeolites, and solid glass beads. PQ has earned its reputation as the driving force in silicate chemistry by pioneering many industry innovations – from the first patented silicate furnace in the U.S. to the first high-value specialty silica-based derivatives, such as zeolite-based catalysts.

PQ innovation goes beyond products. We are continually developing new ways to help you improve your processes and increase the quality of your products in applications as diverse as laundry and dishwashing detergents, industrial cleaning compounds, pulp bleaching, and paper deinking. In fact, every time you do the dishes, wash your clothes, or write a letter...you benefit from PQ chemistry.

PQ's Industrial Chemicals Group – our largest manufacturing group – has the muscle to support all of your sodium metasilicate and polysilicate needs, whether you're formulating cleaning compounds for laundry detergents, industrial cleaners, or textile desizing. In fact, PQ supplies METSO® metasilicates and BRITESIL® polysilicates to customers around the globe.

On the world stage, PQ's presence extends to more than 62 manufacturing facilities in 19 countries on five continents. Strategic international partnerships allow us to serve you even in the most remote areas. Regional customer service centers support you from the lab to the plant. So no matter where you are, PQ is there – prepared to be your global chemicals partner.

Pure Performance



Trusted Ingredients in Cleaning Compounds

METSO® sodium metasilicate and BRITESIL® hydrous polysilicate product families have been specially developed for modern detergents. From heavy-duty industrial and institutional cleaning agents to consumer dishwasher and laundry detergents, METSO and BRITESIL enhance nearly every type of cleaning compound.

While METSO and BRITESIL are strong performers individually, they also add valuable performance properties to your formulation when used together. Combined, the two products complement each other to strike the perfect balance between aggressive cleaning action and gentle, moderate alkalinity.

METSO and BRITESIL products multiply a cleaning compound's effectiveness by three with better cleaning, enhanced processing, and corrosion protection. As a cleaning aid, they attack and remove particulate soil, carbonaceous soil, and oil/fat; neutralize acidic soils; and act as a builder to help soften water. METSO and BRITESIL also serve as binders and

adsorbents of liquid ingredients when processing dry-blended formulations. And, of particular importance is their ability to protect ceramic and metal surfaces from attack by alkaline cleaners.

What makes PQ sodium metasilicates and polysilicates better than other brands? Dust – or, more accurately, the lack thereof. METSO and BRITESIL have high attrition resistance, which means their particles won't break down into dust. Without dust, you improve the working conditions at your plant, reduce the chances of work-related discomfort, increase processing efficiency and effectiveness, and waste less product.

Our METSO and BRITESIL products are made from sand and soda ash so they are completely inorganic and recognized as nonpollutant. The products' soluble silica component is a natural element of the earth's crust and an important micronutrient in our ecosystem.



PQ invented sodium metasilicate and polysilicate – these PQ products have helped detergent compounders satisfy strict modern-day detergent demands.

Innovative Applications



Metal Cleaning
Industrial Cleaning
Pulp and Paper Processing
Food Products Cleaning
Textile Processing
Commercial Laundry and
Dishwashing Detergents

Three Ways to Enhance Detergents With METSO® and BRITESIL® Products

1. Cleaning Aid

As a cleaning compounder, you know that detergents must perform certain basic functions during the process of soil removal, including:

- Neutralization of acidic soil
- Emulsification of oily and greasy soil
- Deflocculation of particulate soil
- Suspension of removed soil
- Prevention of soil redeposition

METSO sodium metasilicates and BRITESIL hydrous polysilicates enhance these cleaning functions, as well as add to the wetting action of the solution.

Emulsification

METSO and BRITESIL products are more effective in the emulsification of grease, oil, and fat into small-sized particles than other sources of alkali. The silicate blends keep these particles segregated and prevent them from recombining and reattaching to the cleaned surface. At the same time, METSO products serve as a buffer to maintain a cleaner's pH level.

Deflocculation

Particulate soils such as carbon, dust, earth, and clay cannot be removed through emulsification. Cleaning system surfactants first wet the dirt and then lift it from the surface being cleaned. METSO and BRITESIL products deflocculate (or break up) agglomerated masses of particulate soils into very fine particles, which tend to repel each other. As a result, the soil is easier to remove and suspend in solutions.

Suspension

Nearly every cleaning operation requires the disposal of solid dirt that cannot be dissolved. Cleaners hold the solid dirt in suspension in a liquid, so it can be rinsed and drained away. BRITESIL hydrous polysilicate demonstrates a superior ability to suspend insoluble particulate matter for long periods of time.

METSO sodium metasilicate's negative charge has an additive effect on the negative charge typical of particulate soils and, therefore, contributes to the repelling forces between particles. Repelled from each other, particles will not reattach to one another. In addition, METSO's ability to emulsify oil enhances the suspension of oily soils and aids in their removal and rinsing.

Prevention of Soil Redeposition

The ability of METSO sodium metasilicates to keep emulsified soils and particulate soils suspended in solution contributes to prevention of soil redeposition onto cleaned surfaces. Metasilicates have demonstrated particular effectiveness in preventing redeposition of clay soils on fabrics in laundry applications.

Three Ways to Enhance Detergents With METSO® and BRITESIL® Products (continued)

2. Processing Aid

Adsorption

METSO and BRITESIL products provide formulators with a major processing advantage: the ability to adsorb liquid ingredients. Depending upon the type of liquid surfactant, BRITESIL H24 will adsorb 5% to 15% by weight of a nonionic surfactant. In addition, all METSO and BRITESIL products can be used with either liquid or dry anionic, nonionic, or amphoteric surfactants.

Free-Flowing

Because of their unique composition, METSO – and BRITESIL especially – can be used to help maintain a free-flowing powder for improved processing. Both products dissolve completely without leaving any particles caked at the bottom of the solution. As a result, they are easier to use. When used in conjunction with VALFOR® 100 detergent-grade silica-based zeolites, high surfactant loadings can be achieved.

Compatibility

Of particular note, BRITESIL products exhibit incredible compatibility. PQ chemists have engineered BRITESIL products to have a high degree of compatibility with many common detergent ingredients, making them extremely versatile and easy to process in many formulations. For example, the BRITESIL products are compatible with many inorganic substances, including phosphates, carbonates, and inert fillers. (BRITESIL can be used as a partial replacement for phosphates or as a substitute for more alkaline builders).

BRITESIL is also compatible with sequestrants, including nitrilotriacetic acid (NTA), citrates, gluconates, and zeolites. For use in dishwashing detergents, BRITESIL products exhibit good compatibility with organic bleach ingredients.

3. Corrosion Protection

METSO and BRITESIL products deliver iron-clad protection from the harsh, corrosive effects of alkalinity. Corrosion protection is an extremely important detergent-enhancing property. Consumers demand it to protect their clothes in the washing machine, as well as their china and cookware in the dishwasher. Industrial/institutional companies need it to protect their expensive washing equipment.

How it Works

METSO and BRITESIL products moderate the tendency of alkali to corrode and dissolve metals. Sodium silicate reacts with metal oxides to form a protective film on metal surfaces. This film is maintained as long as small amounts of soluble silica remain in the presence of water.

The sodium silicate base in METSO and BRITESIL helps protect:

- Washing machine parts and interiors
- Glass and ceramic ware
- Enamel and porcelain cookware
- Metal parts of clothing (i.e., zippers and snaps)
- Sensitive metals (i.e., aluminum, copper, brass, zinc, and tin)

The Presence of Strong Alkalies

Even in cleaning solutions that require very strong alkalies to remove tough soils, METSO and BRITESIL products counter those destructive effects. Compared to caustic soda, sodium metasilicates are less corrosive at equivalent alkali values.

PQ can help you formulate the right proportions of product to use in conjunction with cleaning agents such as complex phosphates, synthetic detergents, and other alkaline materials that normally increase the corrosive activity of cleaning solutions. The right formulation can be easily established because the corrosion-inhibiting properties of both products are directly proportional to the soluble silica content.

METSO® Sodium Metasilicates

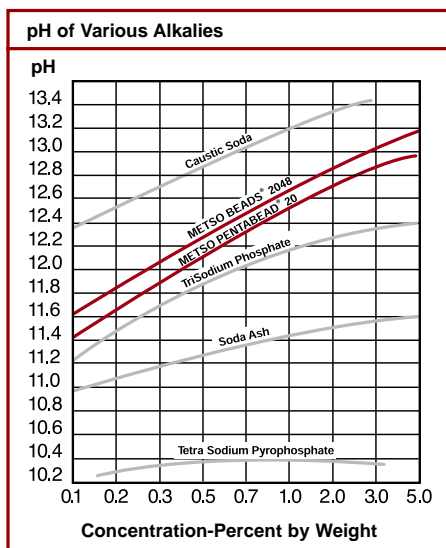
Performance Properties

To understand the functional properties of sodium metasilicates, it is necessary to distinguish between the metasilicates and less alkaline forms of sodium silicate. Sodium silicates are either colloidal solutions, anhydrous powders or glasses, or hydrated powders. The distinctively different characteristics of each sodium silicate product are determined by different ratios of SiO_2 to Na_2O .

PQ sodium metasilicate products like METSO BEADS® 2048 have a definite crystalline form and a SiO_2 to Na_2O ratio on a molar basis of 1:1.

They are readily soluble in either hot or cold water and form solutions that are not as viscous or tacky as those made with other, higher-ratio silicates. The pH levels of sodium metasilicate solutions and other alkalis at various concentrations are given in Table 1.

Table 1



The alkalinity of sodium metasilicate enables it to neutralize acidic soil, aid in saponification and emulsification of fats and oils, and enhance solubilization or dispersion of particulate soils and some proteinaceous materials. The strong buffering capacity of silicates maintains the pH at a high level in the presence of acidic soils or on dilution.

METSO's important solubility, buffering, and detergent properties enhance the overall performance of cleaning compounds.

Solubility

The temperature of a metasilicate solution will determine its rate of solution as well as the maximum limits of its solubility. Table 2 shows the solubility limits for each METSO product. When making solutions at maximum concentration, you must maintain the temperature above the solubility point so that recrystallization will not occur. High concentrations, however, may remain in stable solution for short periods of time.

Table 2

Upper Limits of Solubility for METSO® Sodium Metasilicate Products				
METSO PENTABEAD® 20				
Temperature		Solubility in H ₂ O		
F	°C	%(wt.)	oz./gal.	g./liter
32	0	12	17	125
50	10	18	30	220
68	20	27	49	365
86	30	38	82	610
100	38	42	96	715
120	49	47	117	875
140	60	54	160	1195
160	71	61	208	1555
METSO BEADS® 2048				
Temperature		Solubility in H ₂ O		
F	°C	%(wt.)	oz./gal.	g./liter
32	0	7	9	70
50	10	11	15	115
68	20	16	24	180
86	30	22	37	275
100	38	24	42	310
120	49	27	49	365
140	60	31	60	445
160	71	35	72	535

Buffering Action

METSO sodium metasilicates' outstanding buffering ability is particularly important because it reduces the impact of acidic soils on the performance of cleaning products. Acidic soils can lower the pH of cleaning solutions below the optimum levels required for the cleaner's surfactant systems to do their jobs well. However, the effect of acidic soils is minimized when proper amounts of a METSO product are present to buffer the solution.

METSO® Sodium Metasilicates

Performance Properties (continued)

The alkali in METSO sodium metasilicates helps maintain pH values over an extensive loading of acidic soil. In fact, Table 3 shows how METSO completely neutralizes acidic soil. Most alkalies exhibit a very rapid drop in pH as acidic soil loadings increase, which leads to a reduction in the overall performance of the cleaning solution. For example, the solution will not emulsify oils and grease or suspend particulate soils as thoroughly and effectively as it should.

METSO's buffering capability also benefits other applications such as textile and paper pulp bleaching, where the buffering action of silicate regulates alkalinity and prevents unnecessary degradation of the bleach.

Detergency

Detergency is most easily defined as the process of removing soil from surfaces. Of course, when developing your detergent formulation, four elements must be carefully considered:

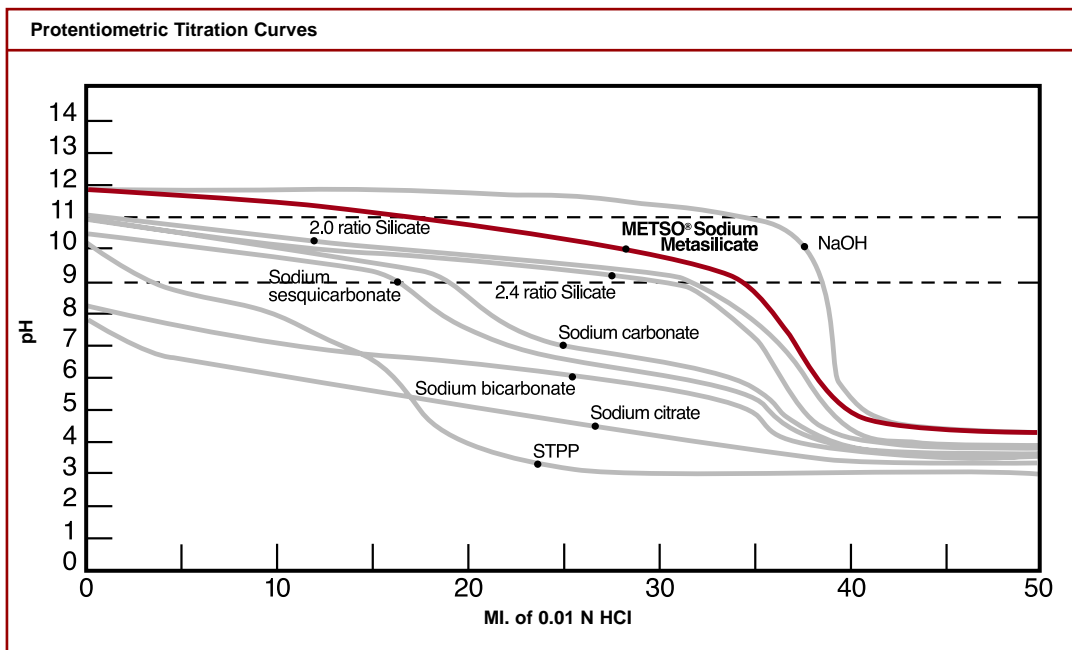
- **Type of Soil:** particulate, inorganic or carbonaceous – oily, proteinaceous

- **Type of Substrate or Surface:** soft surfaces like fabrics to a variety of hard surfaces like metal, ceramic, glass, masonry, and concrete
- **Application:** spray, immersion, flooding, wipe-on
- **Water Condition:** hardness, temperature

METSO products contain optimum proportions of alkali and soluble silica for most cleaning requirements as mentioned above. METSO disperses grease and dirt deposits into small suspended particles that rinse away without redepositing on freshly washed surfaces. The multifunctional cleaning properties of METSO sodium metasilicates are becoming increasingly useful as changes in cleaning formulations are required by new environmental regulations.

The cleaning properties of METSO products have been adopted by formulators to effectively compensate for cleaning properties lost as original detergent ingredients are replaced in cleaning formulations. A balance of cleaning properties can be obtained by altering the surfactant content of formulations and by adding other PQ products such as VALFOR® 100 zeolite. Consult the PQ Detergent Formulary for suggestions.

Table 3



METSO® Sodium Metasilicates

Physical Characteristics

To provide you with formulating flexibility, PQ supplies METSO sodium metasilicate in two forms: METSO BEADS® 2048 (anhydrous) and METSO PENTABEAD® 20 (pentahydrate). Similar to BRITESIL, both METSO products are rapidly dissolving, dustless, concentrated sources of alkali and silica. PQ chemists have developed a proprietary process to create unique, dustless METSO products.

METSO BEADS® 2048

Anhydrous Sodium Metasilicate

Table 4

METSO BEADS® 2048 Anhydrous Sodium Metasilicate	
Typical analysis, % by weight	
Na ₂ O	51.00
SiO ₂	47.00
CO ₂	1.66 maximum
Particle Size (Tyler Screen)	93 wt. % between 20 and 65 mesh
Density	65 lb./ft. ³ (1.04 g./cm. ³)
Melting Point	1990°F (1087.7°C)
Rate of Solution in Water [5% by weight @ 70°F (21°C)]	80 seconds
Appearance of Solution	Clear

METSO BEADS 2048 is a white, free-flowing bead form of anhydrous sodium metasilicate. (It meets Federal Specification O-S-604b, Type II for anhydrous sodium metasilicate).

One important characteristic of METSO BEADS 2048 is its highly active alkali balanced by a minimum inactive alkali content. Table 5 gives active and inactive alkali content for several common industrial alkalies.

Table 5

Average Composition of Industrial Alkalies						
Material	Titratable			% Water	Other Major Constituent	pH of 1.0% Solution
	% Active (1)	% Inactive (2)	% Total			
METSO PENTABEAD® 20	28.30	1.20	29.30	41.70	28.50% SiO ₂	12.40
METSO BEADS® 2048	49.00	2.00	51.00	0.50	47.00% SiO ₂	12.60
Sodium Hydroxide (Caustic Soda)	75.60	0.40	76.00	22.00	None	13.10
Sodium Carbonate (Soda Ash)	28.70	28.70	57.40	Nil	42.00% CO ₂	11.40
Sodium Sesquicarbonate	13.70	26.90	40.60	19.90	38.50% CO ₂	9.80
Sodium Bicarbonate	0.90 (3)	36.00	36.90	10.60	51.50% CO ₂	8.40
Tri Sodium Phosphate	10.00	8.80	24.10 (4)	56.80	18.20% P ₂ O ₅	12.10
Tetra Sodium Pyrophosphate (Anhydrous)	8.00	15.00	46.10 (4)	Nil	52.90% P ₂ O ₅	10.20
Sodium Tripolyphosphate	4.30	12.60	42.00 (4)	Nil	57.00% P ₂ O ₅	9.40
Hexametaphosphate	0.00	1.97	30.40 (4)	Nil	69.60% P ₂ O ₅	6.50
Sodium Tetrakisphosphate	0.00	10.17	39.60 (4)	Nil	60.40% P ₂ O ₅	8.50

(1) Titratable with phenolphthalein. Varies slightly with concentration.
(2) Titratable with methyl orange. Varies slightly with concentration.
(3) Theoretically no active alkali, but commercial product shows a little.
(4) Note only part of total alkali is titratable; remainder is fixed and unavailable for neutralizing acids.

Other physical characteristics of METSO BEADS 2048 provide many important detergent compounding advantages including:

- Uniform particle size
- Reduced caking tendency
- Rapid dissolution
- High attrition resistance
- Uniform dissolution rate
- Less dust
- Negligible insolubles

METSO PENTABEAD® 20

Sodium Metasilicate Pentahydrate

Table 6

METSO PENTABEAD® 20 Sodium Metasilicate Pentahydrate	
Typical analysis, % by weight	
Na ₂ O	29.30
SiO ₂	28.70
H ₂ O	41.30
Particle Size (Tyler Screen)	94 wt. % between 20 and 48 mesh
Density	55 lb./ft. ³ (0.88 g./cm. ³)
Melting Point	162°F (72.2°C)
Rate of Solution in Water [5% by weight @ 70°F (21°C)]	35 seconds
Appearance of Solution	Clear

METSO PENTABEAD 20 is a unique form of sodium metasilicate. It's a free-flowing beaded pentahydrate powder. METSO PENTABEAD 20 provides the same benefits as METSO BEADS 2048 in terms of reduced dusting and caking, uniform particle size, and negligible insolubles, but also adds a valuable, distinct advantage.

METSO PENTABEAD 20 has an unusually fast dissolution rate. To you, this translates into major cost savings in both process time and production costs. In addition, the product's endothermic heat of solution property makes it safer for your staff to work with when preparing solutions.

METSO PENTABEAD 20 meets Federal Specification O-S-604b, Type I for sodium metasilicate pentahydrate.

BRITESIL® Hydrous Polysilicates Performance Properties & Physical Characteristics

BRITESIL hydrous polysilicates are white, free-flowing powders that dissolve rapidly in water for improved efficiency. BRITESIL's chemical and physical composition (i.e., ratio, hydration, and particle size) are carefully controlled to ensure optimum solubility, detergency, and alkalinity. See Table 7.

Table 7

Typical Composition and Properties of Various BRITESIL Grades							
	C20	C24	C265P	H24	H20	H265HP	HS330
Weight ratio, SiO ₂ :Na ₂ O	2.00	2.40	2.65	2.40	2.00	2.65	3.30
% Na ₂ O	27.00	23.80	23.00	23.80	27.00	22.00	19.00
% SiO ₂	55.00	57.20	61.00	57.20	27.00	59.00	63.00
% H ₂ O	17.50	17.50	17.50	17.50	17.50	17.50	17.50
Density lb./ft. ³ g./cm. ³	31.00 0.55	38.00 0.61	— 0.40	52.00 0.80	50.00 0.80	— 0.80	— 0.60
Particle size dist., Tyler Screen	>95% thru 40 mesh	99% thru 10 mesh	>90% thru 40 mesh	96% thru 10, held on 100 mesh	94% thru 10, held on 100 mesh	>99% thru 10 mesh	>98% thru 40 mesh
% Ignition loss	18.50	18.50	18.50	18.50	18.50	18.50	18.50
Max. weight % of insolubles	0.12	0.12	0.12	0.12	0.12	0.12	<2

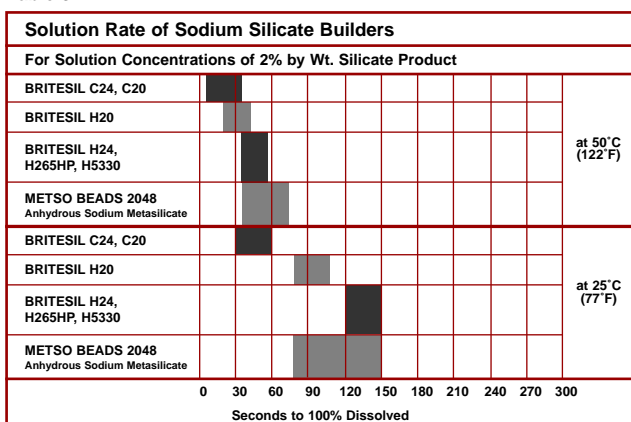
It is customary in the silicate industry to express the chemical composition of the silicate in terms of silica-to-alkali (SiO₂:Na₂O) weight ratio. BRITESIL hydrous sodium polysilicates are available at ratios of 2.0 and 2.4.

Solubility

Ratio

BRITESIL products are available in silicate-to-alkali (SiO₂:Na₂O) weight ratios between 2.0 and 3.3. As the ratio of sodium silicate powder decreases, the rate of solution increases. Consequently, if other factors are the same, 2.0 ratio BRITESIL H20 will dissolve more rapidly than 2.4 ratio BRITESIL H24, and so on.

Table 8



Hydration

A hydrated silicate dissolves much faster than the corresponding anhydrous glass, and as a rule, the hydration factor outweighs all other aspects in determining the rate of solution. As a result, the BRITESIL products dissolve at 50°C (122°F) to form 2% or 25% solutions at a faster rate than anhydrous sodium metasilicate.

Particle Size

BRITESIL's rate of solution is influenced by the exposed surface area, but this is normally not as important as ratio or hydration. Nevertheless, fine sizing can notably shorten the time necessary for the product to dissolve. Thus, fine-powdered BRITESIL C24 dissolves faster than granular BRITESIL H24, though they are both manufactured at 2.4 ratio.

When BRITESIL is dissolved in water (5% BRITESIL by weight), the insoluble residue after five minutes at 60°C (140°F) does not exceed 0.1%.

Detergency

BRITESIL products contain optimum proportions of alkali and soluble silica, rate of hydration, and particle size for many detergent requirements. They disperse grease and dirt deposits into small, suspended particles that rinse away without redepositing on freshly washed surfaces. See page 5 for more discussion about BRITESIL's unique detergency properties.

Alkalinity/Buffering

Well-buffered, controlled alkalinity is critical for optimum detergent performance. As evidenced by Table 3 on page 8, the sodium silicate in BRITESIL products is far superior to polyphosphate, carbonate, and citrate as a source of alkalinity and buffering. The 2.0, 2.4, 2.65, and 3.3 ratio polysilicates provide pH values ranging from 9 to 11, which are optimum for detergent effectiveness.

Packaging and Handling of METSO® and BRITESIL® Products

For convenience of shipping, storing, and handling, METSO sodium metasilicates are packaged in polyethylene bags, fiber drums with polyethylene liners, and semi-bulk containers. For greater economy, the METSO products are also sold in bulk to those customers equipped for buying in substantial quantities.

All BRITESIL products are available in bulk, semibulk, or 50-pound polyethylene bags. These bags ensure delivery of the product in a fresh, free-flowing state.

Bulk Unloading

METSO and BRITESIL products are well-suited to pressure differential (P.D.) bulk delivery. Trailer tank loadings range generally from 36,000 to 46,000 pounds. Unloading often requires up to one and a half hours depending upon loading weight and the storage bin location.

The P.D. unloading system will operate adequately in optimum time when the combined lift and horizontal transfer distances are in the range of 150 feet. Piping to the storage bin should be 4 inches in diameter with long sweeps and bends to minimize friction loss and potential blocks in the line. Short radius bends should be avoided.

Bulk Storage

Minimum storage capacity in the range of 60,000 to 70,000 pounds is suggested. Periodically, inventory should be used up so that fresh material can be made available.

Welded carbon steel is the preferred material of construction for storage bins. Bin interiors should be thoroughly cleaned and sandblasted to remove

rust scale and other contaminants prior to initial filling. Epoxy coatings may be used on the interior surfaces.

Bulk storage bins exposed to the weather should be painted white or with another reflective paint such as aluminum to minimize sun-heat absorption. This applies particularly to the pentahydrate products, which have a melting temperature of about 160°F (71°C). The bin should be vented to the atmosphere. A simple wet washer is adequate for dust control, but local regulations may require bag-type dust control equipment.

Humidity Control – IMPORTANT

Dry sodium silicates exhibit a natural tendency to absorb water from the ambient air, so it is important that partially used containers be tightly closed and sealed. However, when product is stored in humid air for prolonged periods of time, it can become sticky and cake into cumbersome lumps. As a result, the product may be difficult to work with.

Table 9 illustrates the relative humidity at which the moisture content of air is in equilibrium with common types of dry sodium silicates and, for comparison, with caustic soda (NaOH) and caustic potash (KOH).

For storage in bulk, provisions should be made to maintain the relative humidity of the air within the storage bin at a level near the equilibrium point of the product.

When PQ dry silicates are supplied in packages (polyethylene bags or drums), the polyethylene packaging material provides protection for storage at high humidity conditions for reasonable periods of time.

Table 9

Relative Humidity Equilibrium Points		
Product	Equilibrium R.H.	Humidity Effect
METSO PENTABEAD® 20	55% to 35%	Gain wt. above 55% Lose wt. below 35%
METSO BEADS® 2048	35%	Gain wt. above 35%
NaOH & KOH	1%	Gain wt. above 1% (at 7 to 9% R.H. are deliquescent: changing from solid to liquid)

Safety Precautions for METSO® and BRITESIL® Products

Important METSO Safety Information

All METSO products are strongly alkaline and, therefore, warrant care in handling to prevent discomfort or injury. PQ's packaging for METSO products carries appropriate precautionary labels that conform to the requirements of OSHA Hazard Communication Rule, 29 C.F.R. – 1910.1200, and the American National Standard for the Precautionary Labeling of Hazardous Industrial Chemicals, ANSI Z129.1 – 1982. PQ also provides Materials Safety Data Sheets, which provide more detailed safety and handling information for all METSO products.

Important BRITESIL Safety Information

BRITESIL products, although not as alkaline as METSO, still require care in handling to prevent discomfort or injury. Users should observe the precautionary information on the BRITESIL package label. PQ also provides Materials Safety Data Sheets, which provide more detailed safety and handling information for all BRITESIL products.

METSO and BRITESIL products are made of soluble silicates, which are inorganic and present no danger of low flash point or flammability. For additional information or technical assistance, contact PQ and ask to speak with a technical support representative who specializes in the METSO and BRITESIL product lines.

The PQ Commitment

Doing all that it takes to support your global sodium metasilicate and polysilicate needs.

PQ specializes in developing better ways to use our products in your existing applications, and in developing new end uses that add value to your products. With unparalleled expertise in silicate chemistry and extensive experience in the industries PQ serves, our Technical Service department is a valuable resource to address all of your product, process, and application questions.

PQ operates manufacturing plants in every major industrial region in the U.S., so that we can deliver products to you quickly and efficiently. A team of PQ Customer Service Representatives is available at every plant, providing you with responsive, hands-on support.

PQ also provides emergency information 24 hours a day through our Emergency Response Answering Service. In the event of an emergency involving METSO®, BRITESIL®, or any other PQ product, please call **610-651-4200**.

When you need technical assistance, information, or product samples of our METSO or BRITESIL products, talk to PQ Corporation – the world's source for silicate and silica-based derivative products.

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www.pqcorp.com



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.

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