PRODUCT DATA SHEET

Neobor®

$Na_2B_4O_7 \cdot 5H_2O$
Sodium tetraborate pentrahydrate
Disodium tetraborate pentahydrate
Grades: MG Granular and Technical Granular
CAS Number 12179-04-3

20 MULE TEAM BORAX™
RioTinto

Concentrated power for reduced costs

Neobor® is a concentrated sodium borate made of white crystalline granules or powder. It is mildly alkaline in solution. When compared to borax, *Neobor* has lower transportation, handling, and storage costs because it is a more concentrated product.

Applications

Glasses and fiber glass

A source of boric oxide (B_2O_3) in many compositions, including insulation fiber glass, textile fiber glass, and borosilicate glasses. It also provides a source of sodium and is used in combination with boric acid when it is necessary to control the sodium to boron ratio in glass.

The product controls glassmaking melt and influences the final product properties. In fiber glass, it assists fiberizing and gives durability in use while decreasing thermal emissivity. In borosilicate glass, *Neobor* gives a low coefficient of thermal expansion (thus providing resistance to heat and thermal shock) and improves chemical durability.

Glass type	Thermal expansion	Melting Temperature	Melting Rate	Glass Viscosity	Surface Tension	Chemical Resistance
Insulation Fiber Glass (Glass Wool)		X	X	X	X	X
Textile Fiber Glass (E Glass)		X	X	X	X	X
Borosilicate Glass	X	X	X	X		X
Glazes and Enamels	X	X	X	X	X	X

Glazes and enamels

Increases strength, scratch resistance, and chemical resistance of ceramic wares such as tiles, tableware, porcelain, and enameled appliances. By controlling the coefficient of expansion, *Neobor* facilitates thermal fit between glaze and body; it also reduces melting temperatures, inhibits devitrification, and provides for a smooth, even finish.

Fire retardancy

Borates change the oxidation reactions in the combustion of cellulosic materials to cause the formation of carbon residue. This char acts as a barrier to combustion and diverts the decomposition products that would otherwise smolder. *Neobor*, in combination with boric acid, is particularly effective in reducing the flammability of cellulosic materials.

Neobor®

20 MULE TEAM BORAX™
RioTinto

Corrosion inhibition
Incorporated in many aqueous systems requiring corrosion inhibition. It protects ferrous metals against oxidation. *Neobor* is also used in the manufacture of automotive anti-freeze formulations, water treatment chemicals, and metal-working fluids.

Adhesives
Neobor is the part of the starch adhesive formulation for corrugated paper and paperboard. *Neobor* is a peptizing agent in casein and dextrin-based adhesives. It greatly improves the tack and green strength of adhesive by crosslinking conjugated hydroxyl groups.

Industrial soap and detergents
Used in many industrial and institutional cleaning compounds as:

- pH buffering agent
- Oil emulsification aid
- Gentle abrasive

When combined with polyhydroxyl compounds, *Neobor* can be used for viscosity control. It is also used as an additive in polishes and waxes.

Consumer products
Used in in the manufacture of sodium perborate—a bleaching agent in laundry powders. It facilitates removal of oily soils from fabrics, stabilize enzymes, and soften water.

Additional applications
Used as a lubricant carrier in wire drawing; stabilizer and bonding agent in refractories, cover flux in metallurgy, set retardant in cements and concrete, pH buffer in aqueous solutions, and as a wax emulsifier.

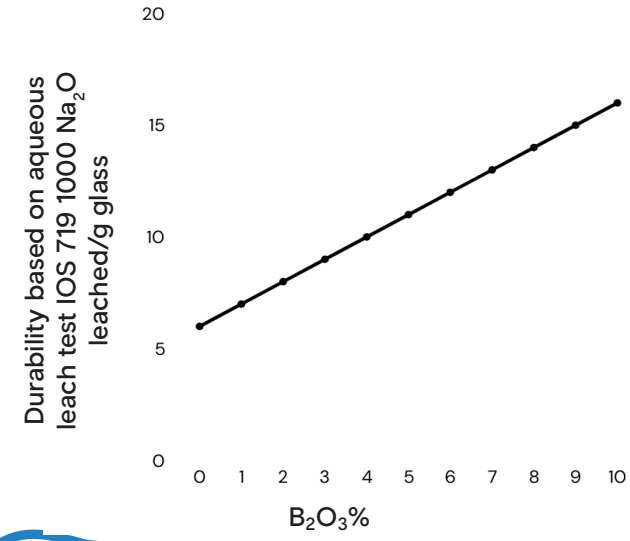
Theoretical chemical composition

Theoretical chemical composition	
% B_2O_3	47.80
%Na_2O	21.28
%H_2O	30.92
Anhydrous equivalent $Na_2B_4O_7$ %	69.08

Characteristics

Characteristics	
Molecular weight	291.30
Specific gravity	1.88
Melting point	743°C (1369.4°F)
Heat of solution (absorbed) 1 wt % at 35°C (95'F)	2.57 x105 J/kg (110 BTU/lb))

Effect of B_2O_3 on insulated fiberglass durability

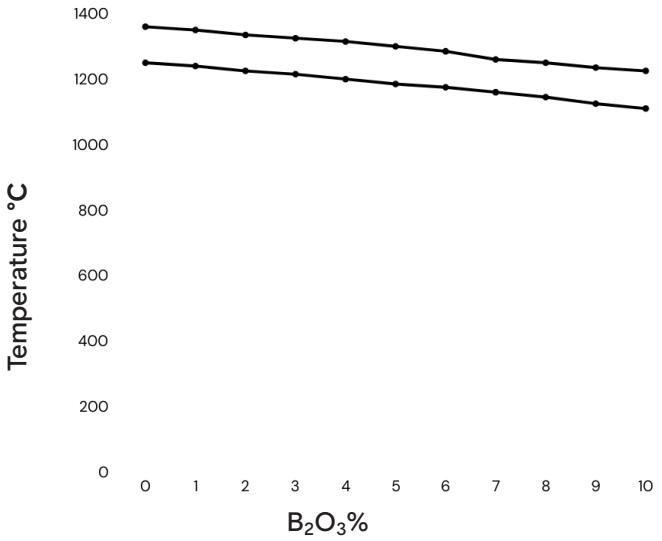


Neobor®

20 MULE TEAM BORAX™ RioTinto

By reducing glass viscosity, the addition of B_2O_3 progressively lowers both the melting and fiberizing temperatures.

Effect of B_2O_3 on insulated fiberglass manufacture



By increasing aqueous durability, the addition of B_2O_3 improves insulation fiber glass resistance to atmospheric corrosion.

Solubility

4.53% by weight in saturated solution (water) at room temperature

Solubility in water	
Temperature °C (°F)	***Neobor* % by weight in saturated solution**
0 (32)	1.52
5 (41)	1.88
10 (50)	2.36
15 (59)	2.90
20 (68)	3.59
25 (77)	4.43
30 (86)	5.50
35 (95)	6.89
40 (104)	8.57
45 (113)	10.86
50 (122)	13.68
55 (131)	17.73
60 (140)	23.16
65 (149)	25.88
70 (158)	28.21
75 (167)	30.69
80 (176)	33.85
85 (185)	37.06
90 (194)	40.62
95 (203)	45.02
100 (212)	50.13

Neobor®

Other solutions (methanol, propylene glycol)

Solubility in other solvents		
Organic solvent	**Temp °C (°F)**	***Neobor* % by weight in saturated solution**
Methanol	25 (77)	16.94
Propylene glycol	25 (77)	21.86
Ethylene glycol	25 (77)	31.12
Diethylene glycol	25 (77)	9.99

pH

Dissolved in water, *Neobor* hydrolyzes to give a mildly alkaline solution. It is thus capable of neutralizing acids. It also combines with strong alkalis to form compounds of lower pH. The relatively constant pH of *Neobor* solutions makes it an excellent buffering agent.

Stability

Neobor is a stable crystalline product which does not change chemically under normal storage conditions. If wetted it reacts exothermically with the water, forming borax decahydrate. Care should therefore be taken to prevent exposure of the product to moisture, and to avoid wide fluctuations in temperature and humidity during storage. This can also cause the product to cake. It is, of course, essential to maintain the integrity of the packaging.

Neobor is stable under ordinary conditions, free-flowing, and easily handled by air or mechanical conveying.

Containers

May be available in bulk, IBCs, or small bags

About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally-occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles northeast of Los Angeles.

About 20 Mule Team products

U.S. Borax produces the *20 Mule Team*® borates family of products from naturally occurring minerals and have an excellent reputation for purity and safety when used as directed. Borates are key ingredients in a number of industrial applications including fiberglass, glass, ceramics, batteries and capacitors, wood preservatives, and flame retardants.

High quality, high reliability, high performance borate products. It's what we're known for.