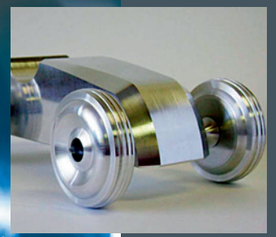
Metalworking & Corrosion Protection Industry

sonneborn

REFINED PRODUCTS



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Sonneborn company background

Since 1903, the Sonneborn name has been synonymous with the world's highest quality refined hydrocarbons. Our goal is to provide customers with premium products, superior technical capabilities, and dependable service so that they receive the very best value in the industry.

In 2010, Sonneborn acquired the sales and marketing rights for Petronate® natural sodium sulfonates, products we pioneered decades ago. We have been manufacturing these same sulfonates all along; now Sonneborn has acquired them for direct sale. As with all the products we make, Sonneborn is committed to providing sodium sulfonates with the highest quality and dependable service that our customers require and have come to rely upon.

The superior emulsion stability, anticorrosion characteristics and the predictable, consistent performance of our high quality Petronate® natural sodium sulfonates, are now reliably available from Sonneborn, a name you know you can trust to deliver.

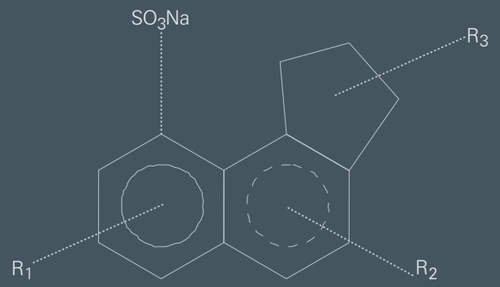
Metalworking Industry

Sonneborn's sodium sulfonates are made from natural petroleum oil feedstocks. As a result, these sulfonates contain a very broad molecular weight distribution. This broad distribution enhances the ability of our sulfonates to interact with the oil and to provide excellent emulsification. In contrast, synthetic sodium sulfonates of the same molecular weight have a much narrower distribution and therefore, do not function as well.

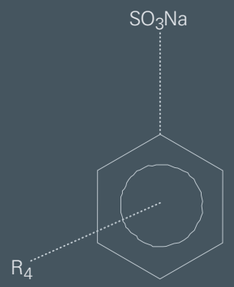
FEATURES	BENEFITS
Natural Petroleum Sulfonate Product	Performance
Range of Molecular Weights Available	Formulator Flexibility
Consistent Quality	Quality Control
Reliable Supply	Production Plan Assurance
High Compatibility with Basestocks	Raw Material Flexibility
High Storage Stability	Plant Handling
Global Supplier	Supply Chain Management
Global Registration	EH&S Management
Proven Track Record	Industry Wide Acceptance

PETROLEUM SULFONATES COMPOSITION

Sonneborn's sodium sulfonates are composed of a poly-alkylated aromatic ring system, where the alkylates are primarily branched and short-chained. Conversely, typical synthetic sodium sulfonates are alkylated aromatic ring systems where the alkylates are linear and long-chained. The short-chained, branched alkyl aromatic groups found in Sonneborn's sodium sulfonates provide benefits in both emulsion and rust prevention by improving the compatibility with the base oil.



Model Natural

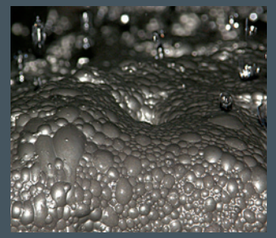


Model Synthetic

where the chain length of R_1 , R_2 and R_3 << R_4

APPLICATION INFORMATION

Sonneborn's sodium sulfonates provide excellent emulsion quality and corrosion resistance in customer formulations. While the lower molecular weight sulfonates provide excellent emulsion performance, the higher molecular weight sulfonates provide unsurpassed rust prevention. Depending on the application, the balance of these two properties is critical for maximum performance.



In oilfield and mining applications which are less concerned with rust prevention, the preference is the strong emulsification properties of Petronate® L. However, in the industrial oils market, where rust prevention is key, the preference is for the corrosion prevention properties of Petronate H and Petronate HH. In the metalworking industry, a balance of both the emulsion and corrosion performance is critical to a successful formulation and Petronate HL is preferred for its balanced emulsion and corrosion resistant properties. Finally, Sonneborn has the capability to make special blends of our products in the desired ratios upon request.

METALWORKING

Emulsifiers
Demulsifiers
Dispersing Agents
Rust Preventatives

OILFIELD

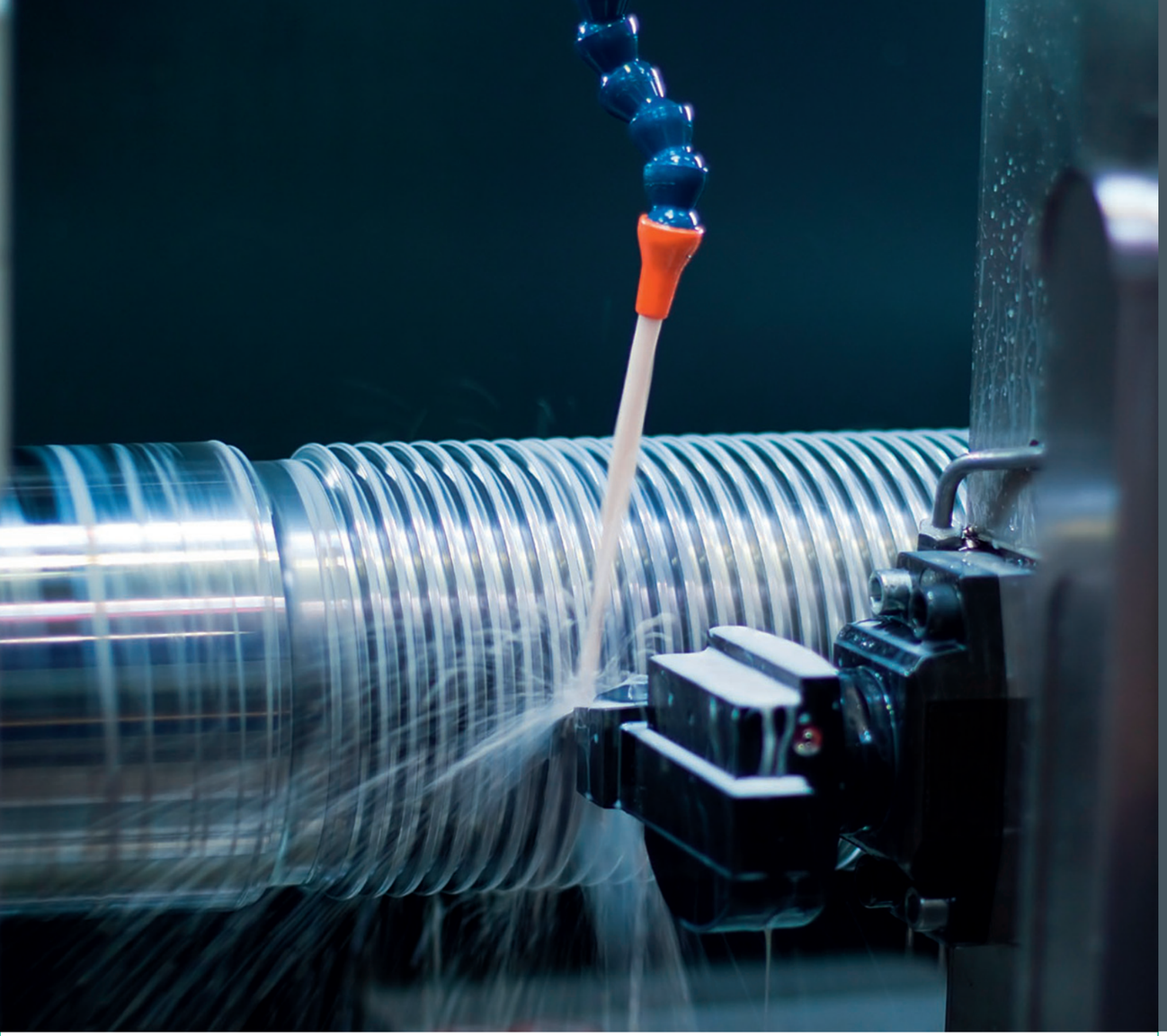
Flooding Compounds
Crude Oil Emulsifiers
Bitumen Frothing
Oilsand Flotation
Flocculants

INDUSTRIAL OILS

Emulsifiers
Demulsifiers
Dispersing Agents
Moisture Absorbants
Wetting Agents
Rust Preventatives
Degreasing Agents
Detergents

MINING

Ore Flotation
Phosphate Sand Flotation
Quartz Sand Flotation



PETRONATE PRODUCTS

Our line of Petronate® sodium petroleum sulfonates vary in average molecular weight from 425 to 540. They are natural products which are transparent, dark brown liquids that are readily soluble in mineral oil.

Property *	Method	Petronate L	Petronate HL/L	Petronate HL	Petronate 480	Petronate H	Petronate HH
Sodium Sulfonate, wt %	ASTM D3712	62	62	62	62	62	62
Oil, wt %	ASTM D3712	33	33	33	33	33	33
Molecular Weight	ASTM D3712	425	440	455	470	500	540
Inorganic Salt, wt %	ASTM D3712	max 1.0	max 1.0	max 1.0	max 1.0	max 1.0	max 1.0
Free Alkalinity, mgKOH/g	SAM 150	1.0	1.0	1.0	1.0	1.0	1.0
Water, wt %	ASTM D95	4.5	4.5	4.5	4.5	4.5	4.5
Color (dilute)	ASTM D1500	max 5.0	max 5.0	max 5.0	max 5.0	max 5.0	max 5.0
Flash Point, COC, °C	ASTM D92	190	190	190	205	210	230
Density @ 20°C kg/m3	ASTM D4052	1020	1020	1015	1010	1010	1010

* typical values

Corrosion Protection Industry

Sonneborn produces a range of oxidized petrolatums (Oxpets) that are used primarily for rust prevention and anti-corrosion. These chemically oxidized petrolatums are mixtures of long-chained, branched and cyclic hydrocarbons plus their derivates such as organic acids, oxi-acids and esters. The acids present in our Oxpets can be neutralized with bivalent metal oxides, yielding end-products with a high molecular weight and wax-like nature which have excellent water-resistant properties and corrosion protection.

APPLICATION INFORMATION

Neutralization is best achieved with calcium hydroxide or zinc oxide in a white spirit dilution. This white spirit solution of neutralized products provides improved anti-corrosion properties through the addition of a high molecular weight petroleum sulfonate. To obtain special characteristics in the end-product it is also possible to add Petrolatum 640/20 or Tech Pet F. The end-product may be sprayed of brushed on the metal surface to be protected.

OXPET PRODUCTS*

Property	Method	WH-1	WH-6	LA 1531/20
Acid number, mg KOH/G	ASTM D 664	48-53	42-47	17-22
Saponification number, mg KOH/g	DIN 51559	100	110	47
Congealing Point, ˚C	ASTM D 938	56	54	38
Ash, % by weight	ASTM D 482	max 0.5	max 0.5	max 0.5
Flash Point, COC, ˚C	ASTM D 92	min 150	min 150	min 150
Colour, diluted	ASTM D 1500	8	8	8
Density at 100˚C, kg/m^3	ISO 3838	850-950	850-950	800-900

PETROLATUM-TECHNICAL PRODUCTS*

	Drop Melting Point,˚C ASTM D 127	Congealing Point, ˚C ASTM D 938	Cone Penetration at 25˚C, dmm ASTM D 937	Colour
Petrolatum 640/20	35-45	35-43	175-195	brown
Tech Pet F	57-66		160-190	brown

* typical values

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For more information about our products and services, please visit our website **www.sonneborn.com**

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