MANTA

Technical Data Sheet

Version: 1.0

Manta S31

Mercapto-Functional Silane Adhesion Promoter

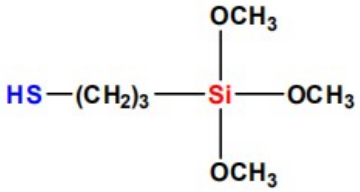
Description

Manta S31 is a bifunctional organosilane possessing a reactive mercapto (-SH) group and three hydrolyzable inorganic methoxysilyl groups.

The unique sulfur-based chemistry of Manta S31 allows it to function as a powerful coupling agent between sulfur-vulcanized rubbers or reactive resins and inorganic fillers/substrates. It is renowned for providing exceptional adhesion to difficult metals such as silver, gold, and copper, and is a cornerstone additive for the Green Tire industry.

It is equivalent to industry standards such as Momentive Silquest A-189, Evonik Dynasylan MTMO, and Shin-Etsu KBM-803.

Typical Physical Properties

Manta Code:	S31
Chemical Name	3-Mercaptopropyltrimethoxysilane
CAS NO.	4420-74-0
EINECS NO.	224-588-5
Formula	C6H16O3SSi
Appearance	Colorless Transparent Liquid
Density (ρ20℃, g/cm³)	1.0570±0.0050
Refractive Index (n25/D)	1.4400±0.0050
Purity (by GC, %)	98min
Molecular Structure	

Features

- Superior Metal Affinity: Provides unmatched adhesion to non-ferrous metals (Copper, Silver, Gold, Aluminum) and stainless steel.
- Green Tire Technology: Essential for coupling silica to SBR/BR polymers, significantly reducing rolling resistance and improving wet grip.
- High Crosslinking Efficiency: The mercapto group can participate in radical polymerization or react with isocyanates and epoxies.
- Enhanced Durability: Improves the moisture and corrosion resistance of sealants and coatings.

Applications

Manta S31 is a high-performance, sulfur-functional coupling agent and adhesion promoter widely utilized across several critical industrial sectors:

1. Rubber Industry & "Green Tire" Technology

Manta S31 is an indispensable additive in silica-reinforced tire tread compounds. By chemically bonding inorganic silica to organic polymers (such as SBR and BR), it drastically reduces the compound's rolling resistance (enhancing fuel efficiency) while significantly improving wet grip and tread wear resistance. It is also extensively used in mineral-reinforced rubber goods like shoe soles, industrial rollers, and mechanical rubber parts to enhance durability and abrasion resistance.

2. Polysulfide & Polyurethane Sealants

Functions as the premier internal adhesion promoter for one- and two-part polysulfide and polyurethane sealants. It ensures superior, water-resistant bonding to glass and various metal surfaces. It is a critical component in the formulation of high-performance insulating glass (IG) sealants, automotive windshield adhesives, and architectural joint sealants.

3. Protective Coatings & Metal Primers

Due to the high affinity of the mercapto (-SH) group for non-ferrous metals, Manta S31 is utilized as a specialized additive or primer to improve the adhesion of epoxy and polyurethane coatings to Copper, Silver, Gold, Aluminum, and Stainless Steel. It effectively prevents sub-film corrosion and prevents oxidation of the metal substrate.

4. Electronics & Copper Foil Treatment

Used in the electronics industry for the surface treatment of copper foils and silver-based conductive inks. It enhances the interfacial bond between the metal and resin matrices (such as Polyimide or Epoxy), ensuring high peel strength and reliability in flexible printed circuits (FPC) and laminates, even under high-humidity or high-temperature soldering conditions.

5. Resin Modification & Composites

Suitable for the chemical modification of various polymer systems, including Butyl, Neoprene, Nitrile, SBR, Epoxy, Phenolic, and Polyurethane. In mineral-filled composites (using Silica, Talc, or Mica), it acts as a coupling agent to increase the mechanical strength and electrical properties of the finished article.

6. Foundry & Abrasives

In the foundry industry, Manta S31 is used as an additive to phenolic and furan resins to improve the strength and moisture resistance of sand cores. In resin-bonded abrasives, it strengthens the bond between abrasive grains (like silicon carbide or alumina) and the resin binder, leading to a longer tool lifespan.

7. Surface Treatment for Precision Metals

Applied as a thin-film surface modifier for precision metal components to provide a hydrophobic, anti-corrosive layer that facilitates subsequent bonding with organic adhesives or coatings.

Packaging

In 20kg pail, 190kg drum, 200kg drum

Safety and Storage

Keep away from heat and open flame. When stored at or below 25°C in the original unopened containers, Shelf life is 24 months.

Contact Information

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