MANTA

**Technical Data Sheet**

Version: 1.0

# Manta MS312

Silyl-terminated polyether (STPE), SMP type

## Description

Manta MS312 is a silane-terminated polyether (STPE, also known as silane-modified polymer, SMP) with trimethoxysilylpropylcarbamate end groups on a polypropylene oxide (PPO) backbone. It is designed as a reactive binder for elastic, moisture-curing adhesives and sealants with medium-high modulus. On exposure to atmospheric moisture the end groups hydrolyze, releasing a small amount of methanol, and condense to form a durable siloxane network. MS312 combines the processability of a polyether with the weathering resistance and adhesion of silane-crosslinked systems.
Performance equivalent to WACKER GENIOSIL® STP-E15.

## Typical Physical Properties

| | |
|---|---|
| Manta Code: | MS312 |
| Chemical Name: | Trimethoxysilylpropylcarbamate-terminated polyether |
| CAS No.: | 216597-12-5 |
| Appearance: | Colorless, transparent viscous liquid |
| Flash Point: | 237 °C |
| Viscosity (25 °C): | 8,000 – 13,000 mPa·s |
| Density (25 °C): | 1.02 – 1.05 g/cm³ |
| Catalyst Dosage (Tin, on polymer): | 1 – 2 % |
| Chemical Structure: |  |
| Activity: | Medium |
| Modulus: | Medium-high |



## Properties

- Curing: cures at room temperature with amine or organometallic (e.g., tin) catalysts; the cure rate is adjusted via catalyst type and level.
- Mechanical properties: medium-high modulus for elastic and structural bonding.
- Transparency: colorless, transparent polymer suitable for clear sealants.
- Aging: good resistance to yellowing and thermal aging.
- Processing: the low viscosity allows high loadings of fillers such as PCC and GCC while maintaining flow.
- Adhesion: adheres to many substrates, including metals, glass, ceramics and many plastics, often without primer; adhesion should be confirmed on the actual substrate.
- Low-temperature flexibility: the low glass transition temperature (Tg) of the polyether backbone helps the cured product retain its mechanical properties over a wide temperature range.

## Applications

1. Elastic and structural adhesives: medium-high-modulus binder for automotive engineering, rail vehicles and container construction.
2. Assembly adhesives: "liquid nail" and high-strength assembly adhesives requiring fast strength build-up.
3. Flooring adhesives: parquet adhesives that require higher movement capability.

4. Construction sealants: paintable, low-VOC sealants for building facades and window installation.
5. Potting and encapsulation: can be evaluated for electronic potting compounds and mold making; shrinkage and electrical properties must be verified in the final formulation.
6. Coatings: reactive binder or additive to improve the scratch resistance and adhesion of industrial coatings, subject to formulation testing.

## Processing

1. Moisture sensitivity: the trimethoxysilyl end groups of MS312 hydrolyze and crosslink on contact with water or atmospheric moisture, releasing a small amount of methanol. Store the polymer in tightly sealed containers and process it under moisture-controlled conditions to avoid premature gelation.
2. Fillers: MS312 can be compounded with common fillers such as precipitated calcium carbonate (PCC), ground calcium carbonate (GCC), fumed silica, quartz flour, diatomaceous earth and aluminum hydroxide. The polymer content can be adjusted to the required properties.
3. Drying: dry all fillers thoroughly before compounding. Vinyltrimethoxysilane (VTMO) is recommended as a water scavenger.
4. Plasticizers: suitable plasticizers include phthalates (e.g., DINP, DIDP), DOTP and low-molecular-weight polyethers (PPG).
5. Additives: adhesion promoters, antioxidants, fungicides and UV/light stabilizers can be added to adjust the end-use properties.

## Typical Performance of a Reference Sample

| MS312 Test Item | Standard | Result |
|---|---|---|
| Appearance | Colorless or light yellow, transparent liquid | Colorless, transparent liquid |
| Viscosity (25 °C), mPa·s | 8,000 – 13,000 | 8,667 |
| pH Value | 6 – 9 | 7 |
| Tensile Strength, MPa | ≥ 0.5 | 0.53 |
| Elongation at Break, % | ≥ 50 | 60 |
| Hardness, Shore A | ≥ 35 | 40 |

## Reference Formulation

| Component | Parts by Weight | Example / Function |
|---|---|---|
| Manta MS312 | 30 - 40 | Silane-terminated polymer (binder) |
| Plasticizer | 10 - 20 | PPG, DINP, or DOTP |
| Water Scavenger | 1 - 2 | Vinyltrimethoxysilane (VTMO) |
| Thixotropic Agent | 2 - 5 | Fumed Silica (Hydrophilic or Hydrophobic) |
| Fillers | 40 - 50 | Ground Calcium Carbonate (GCC) / $TiO_2$ |

| Component | Parts by Weight | Example / Function |
|---|---|---|
| Antioxidants and UV-stabilizers | 0.1 - 2 | Hindered Phenols (AO) / HALS (UV) |
| Adhesion Promoter | 1 - 2 | Amino-silanes (e.g., AMEO, AMMO) |
| Catalyst | 0.3 - 0.6 | Organotin (DBTDL) or Tin-free alternatives |

## Packing

50 kg plastic drum with aluminum-foil liner bag;

200 kg drum with aluminum-foil liner bag;

1,000 kg IBC (tote);

Other pack sizes available on request.

## Safety and Storage

Store in the tightly closed original container in a cool, dry place, protected from moisture and direct sunlight. Shelf life: 24 months from the date of production when stored as recommended. The product is classified as non-hazardous. Refer to the current Safety Data Sheet (SDS) for safety, handling and transport information.

Note: The values in this data sheet are typical values and are not intended for use in preparing specifications. Users should test the product to determine its suitability for their specific application.

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## Contact Information

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