

Product Information

Dynasylan® SILBOND® 40-HF

Ethyl polysilicates - higher flashpoint

PRODUCT DESCRIPTION

Dynasylan® SILBOND® 40-HF is a clear, low-viscosity liquid with a minimum silica content of 40.0% (the Si content of Dynasylan® SILBOND® 40-HF is calculated as SiO₂) and a flash point above 100°F (38°C), classifying it as a combustible liquid. This product is available to customers requiring a higher flashpoint than Dynasylan® SILBOND® 40.

Dynasylan® SILBOND® 40-HF is an ethyl polysilicate that is the partially hydrolyzed product of tetraethyl orthosilicate (TEOS). The partial hydrolysis of TEOS (Si[OEt]₄) results in the conversion of ethoxy groups to hydroxyl groups forming silanols. Subsequent condensation of silanols will form siloxane bonds (-Si-O-Si-O-) and eventually cause the material to gel.

Dynasylan® SILBOND® 40-HF is often used as an intermediate, which is further hydrolyzed to produce a binder that can be used for many applications. Several of these end-uses include inorganic zinc-rich primers, investment casting molds, cores and ceramic shapes, coatings, and thermal insulation.

Typical Properties

Property	Unit	Value
Appearance		Clear Liquid
Boiling Point, min. OECD 103	°C	120
Chemical Name		Ethylpolysilicate
Color		Colorless
Density (20 °C) DIN 51757	g/cm ³	~1.055-1.070
Flash Point, min.	°C	50
Freezing Point OECD 102	°C	100
Odor		ester-like

The data represents typical values (no product specification)

Typical Properties

Property	Unit	Value
Viscosity (20 °C) dynamic DIN 53015	mPa·s	5.0

The data represents typical values (no product specification)

TYPICAL APPLICATIONS

Similar to Dynasylan® SILBOND® Condensed and Dynasylan® SILBOND® 40, Dynasylan® SILBOND® 40-HF is used to deposit silicic acid formed as a result of complete hydrolysis. The resulting silicic acid bonds well to many inorganic substrates, such as glass, ceramic, metal, fillers, pigments, and synthetic fibers. The deposition of a thin SiO₂ layer improves the chemical and thermal stability and mechanical properties.

Other applications are:

- binder, especially for inorganic zinc-rich coatings or precision investment castings
- encapsulant for hydroxyl poor fillers to enhance adhesion with functional silanes
- crosslinker component in cold-curing silicone rubber systems
- hardening component in dentistry for impression materials and as a binder for embedding material

Product Composition

Product Composition	Unit	Value
Silicon Dioxide (SiO₂) Content	wt%	40.0-42.0

The data represents typical values (no product specification)

BENEFITS & ADVANTAGES

Dynasylan® SILBOND® 40-HF is also used as starting material for sol-gel processes. It is usually used in conjunction with alkylsilanes (e.g. Dynasylan® MTES) organofunctional silanes and/or organic precursors (e.g. organic resins) to form siloxane networks. This makes it possible to obtain highly scratch-, abrasion-, and chemical-resistant

coatings. Dynasylan® SILBOND® 40-HF is immiscible with water, therefore hydrolysis requires a cosolvent as a solubilizer. Mineral acids and ammonia are suitable as catalysts. Dynasylan® SILBOND® 40-HF or its hydrolysates are also the binder component for 1- and 2-pack inorganic zinc-rich coatings, for corrosion protection on steel, and for slurries used in precision investment castings.

HANDLING & PROCESSING

Before considering the use of Dynasylan® products please read its Safety Data Sheet (SDS) thoroughly for safety and toxicological data as well as for information on proper transportation, storage and use.

The Safety Data Sheet is available on our website <https://www.evonik.com/en/company/businesslines/se.html> or upon request from your local representative, customer service or from Evonik Operations GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

PACKAGING

Dynasylan® SILBOND® 40-HF could be available in pails, drums, totes and tanker quantities.

Please ask for further details.

SHELF LIFE

In unopened container Dynasylan® SILBOND® 40-HF has a shelf life of min. 12 months from date of manufacture.

Registration Listings

Registry	Status
Australia (AIIC)	Yes
Canada (DSL)	Yes
China (IECSC)	Yes
EU (REACH)	Yes
Japan (ENCS)	Yes
South Korea (KECL)	Yes
New Zealand (NZIoC)	Yes
Philippines (PICCS)	Yes
Taiwan (TCSI)	Yes
USA (TSCA)	Yes

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