Technical Data Sheet

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Silfluo LF-VPDMS E-grade

Electronic-Grade Vinyl-Terminated Polydimethylsiloxane

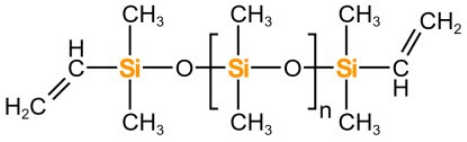
Description:

Silfluo LF-VPDMS E-Grade is an electronic-grade vinyl-terminated polydimethylsiloxane (CAS 68083-19-2) produced through a controlled purification process that reduces alkali metal ions (K^+, Na^+), trimethylamine, residual hydroxyl groups, and cyclic siloxanes (D3 – D10) to levels required for semiconductor, optical, and avionics applications.

The viscosity grades and vinyl content specifications are identical to standard LF-VPDMS; the E-Grade designation refers exclusively to the purity tier — cyclic siloxane content, ionic contamination, and hydroxyl value — rather than to changes in molecular structure or end-group chemistry.

Three purity tiers are available: Standard E-Grade (D3 – D10 < 500 ppm), Premium E-Grade (D3 – D10 < 300 ppm), and Semiconductor E-Grade (D3 – D10 < 100 ppm); tier selection depends on the sensitivity of the target application to silicone vapor deposition and ionic contamination.

Typical Technical Properties:

Silfluo Code:	LF-VPDMS E-grade
Chemical Name:	Electronic-Grade Vinyl-Terminated Polydimethylsiloxane
Synonyms:	E-Grade Vi-PDMS; High-Purity Vinyl Silicone Fluid
CAS NO.	68083-19-2
Molecular Formula:	CH2=CH-Si(CH3)2-O-[Si(CH3)2O]n-Si(CH3)2-CH=CH2
Appearance:	Colorless, clear, and odorless liquid
Chemical Structure:	

Item	LF-VPDMS -100	LF-VPDMS -200	LF-VPDMS -245	LF-VPDMS -300	LF-VPDMS -350	LF-VPDMS -500	LF-VPDMS -1000
Viscosity (25°C, mPa.s)	100±5	200±10	245±15	300±15	350±20	500±25	1000±50
Vinyl Content, mol%	2.86±0.03	1.89±0.03	1.70±0.03	1.54±0.03	1.51±0.03	1.16±0.05	0.86±0.05
Volatile(150°C, 3h)/%				≤1.00			
Item	LF-VPDMS -2000	LF-VPDMS -5000	LF-VPDMS -10000	LF-VPDMS -20000	LF-VPDMS -60000	LF-VPDMS -100000	LF-VPDMS -X
Viscosity (25°C, mpa.s)	2000±100	5000±250	10000±500	20000±1000	60000±3000	100000±5000	X[a]
Vinyl Content, mol%	0.62±0.03	0.43±0.03	0.35±0.03	0.27±0.03	0.22±0.03	0.16±0.03	/
Volatile(150°C, 3h)/%				≤1.00			

Note: As viscosity increases, the terminal vinyl mol% proportionally decreases. Volatility for all E-grades is strictly ⩽1.00% at 150°C for 3h.

Ultra-High Purity Specifications (Cyclic Siloxane Control)

To meet the rigorous demands of global electronic and optical manufacturers, our E-Grade series

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can be strictly customized into the following ultra-pure tiers:
Standard E-Grade: Low cyclic siloxanes (D3-D10) < 500 PPM
Premium E-Grade: Ultra-low cyclic siloxanes (D3-D10) < 300 PPM
Semiconductor E-Grade: Extreme-low cyclic siloxanes (D3-D10) < 100 PPM

Features:

1. Three purity tiers (D3–D10 < 500 / 300 / 100 ppm) selectable by application sensitivity;
2. Alkali metal ions (K^+, Na^+), trimethylamine, and residual hydroxyl groups reduced to electronic-grade levels;
3. Full viscosity range 100–100,000 mPa·s with identical grade structure to standard LF-VPDMS — E-Grade is a drop-in purity upgrade, not a formulation change;
4. Custom viscosity grades available on request;

Applications:

1. Semiconductor Packaging

Used as base polymer in Pt-catalyzed die-attach adhesives, stress-buffering interlayers, and glob-top encapsulants for bare silicon wafers and ICs. Semiconductor E-Grade (D3–D10 < 100 ppm) is required to prevent cyclic siloxane contamination of bond pads and adjacent die surfaces during cure and thermal cycling. Zero K^+/Na^+ ionic contamination prevents ionic migration under device operating voltages. Confirm ionic purity (Na^+, K^+ < target ppm) and D3–D10 content via certificate of analysis for each production lot before use in qualified processes.

2. Optical Fiber Coatings

Used as the transparent matrix in protective cladding compounds for optical fibers. Low cyclic siloxane content (Premium or Semiconductor E-Grade) prevents vapor deposition on fiber surfaces and adjacent optical components during cure and service. Low hydroxyl value reduces absorption at near-IR wavelengths relevant to fiber optic transmission bands (1,310 nm and 1,550 nm). Verify optical transmission and refractive index of cured coating at target wavelengths.

3. Avionics and Aerospace Conformal Coatings and Potting

Used as base resin in conformal coatings and potting compounds for flight-critical avionics where low outgassing under thermal cycling (–55°C to +125°C, per MIL-STD-810 or equivalent) is specified. Premium E-Grade (D3–D10 < 300 ppm) reduces outgassing mass loss below thresholds required by NASA ASTM E595 or equivalent outgassing standards. Confirm total mass loss (TML) and collected volatile condensable material (CVCM) on the complete formulation, not the base polymer alone.

4. LED Encapsulation

Used as base polymer in addition-cure LED encapsulant formulations where thermal outgassing during soldering reflow or long-term operation at elevated junction temperatures causes optical clarity loss or brightness degradation. Standard or Premium E-Grade sufficient for most LED applications; Semiconductor E-Grade applicable where chip surface contamination risk from cyclic siloxanes is specified by LED package qualification requirements.

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Package &Storage:

In 200kg drum and 950kg, 1000kg IBC.

Keep in cool, dry and ventilated place. Keep away from sunlight and fire sources. Keep in unopened containers, shelf life is 36 months from the date of production. It is shipped as non-hazardous substance. Storage beyond the shelf life does not necessarily mean that the product is no longer usable. In this case however, the properties required for the intended use must be checked for quality assurance reasons.

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