Silicone Oligomer Containing Alicyclic Epoxy Groups

KR-470

1 Features

1) KR-470 is a silicone oligomer containing alicyclic epoxy groups.
2) Owing to tetrafunctional groups, KR-470 has excellent physical properties such as hardness and strength after curing.
3) Relatively low molecular weight provides excellent compatibility with many materials.
4) Can be cured with UV light or by heating with the addition of an acid generator.
5) Can be cured with heating with the addition of an acid anhydride or an amine catalyst.

2 General properties

Parameter \ Product name	KR-470
Appearance	Colorless transparent liquid
Viscosity at 25°C mPa·s	3,000
Specific gravity at 25°C	1.10
Refractive index at 25°C	1.487
Volatile content 105°C × 3 h %	3.0
Epoxy equivalent g/mol	200
Surface tension N/m	36×10^{-3}
Active ingredient %	100

(Not specified values)

3 Instructions for use

●Photo-cationic cure type

Blend 100 parts by mass of KR-470 and 2 parts by mass of CAT-7605*1. When coating on a polycarbonate substrate with a No. 14 bar coater and irradiating with UV light (200 mJ/cm^2) the properties of the cured material are as below.

Pencil hardness	HB
Wear resistance*2 ΔHaze	14
Volume change ratio Hydrometer method %	-1

*1: Acid generator
*2: Taber abrasion test method CS-10F, 500g load, 100 rotations

●Acid anhydride cure type

Blend 100 parts by mass of KR-470, 80 parts by mass of hexahydro-4-methylphthalic anhydride, 0.4 parts by mass of dimethylbenzylamine and 2.4 parts by mass of ethylene glycol. Pour into a metal mold and pre-cure at 105°C for two hours and post-cure at 170°C for two hours.
The properties of the cured material are below.

Parameter \ Product name	KR-470	EPOTORT YD-128*1	CELLOXIDE 2021P*2
Shore D	87	85	88
Flexural modulus MPa	2,590	2,940	3,020
Volume change ratio Hydrometer method %	-1.2	-1.7	-2.1
Adhesion (PPA)	100 / 100	100 / 100	100 / 100
Boiling water absorption ratio %	0.46	0.28	0.56
(TMA measurement)			
Tg °C	191	150	193
Coefficient of Linear Thermal Expansion			
($\times10^{-5}$/K)			
< Tg	9.7	7.7	6.9
> Tg	15.4	17.6	16.2

*1: Nippon Steel & Sumikin Chemical Co., Ltd.
*2: Daicel Corporation.
(Not specified values)

4 Handling precautions

1) Seal container tightly and store in a cool, dark place (25°C or below and out of direct sunlight) with good ventilation. Keep away from heat and flame.
2) When painting, coating, curing or drying, it is important to keep the product away from heat and flame and provide adequate ventilation.
3) This product may be polymerized into a gel by heat, acid, base, or certain organo-metallic compounds. Avoid contamination, seal container tightly and store in a cool and dark place.

5 Safety and hygiene

1) Silicone oligomers may cause skin irritation. When handling the products, take care to avoid contact with skin and mucous membranes by wearing protective glasses and gloves. In case of skin contact, immediately wipe off with dry cloth and then flush thoroughly with running water. In case of accidental eye contact, flush immediately with plenty of water for at least 15 minutes and then seek medical attention. Contact lens wearers must take special care when using the products: if the products enter the eye, the contact lens may become stuck to the eye.
2) Breathing of vapors may cause unpleasant symptoms. If you experience such symptoms, move to an area with fresh air immediately.
3) Keep out of the reach of children.
4) Be sure to read the Safety Data Sheets (SDS) for these products before use. SDS are available from the Shin-Etsu Silicone website. If the SDS is not listed on the website, please contact the sales department.
SDS download URL :
https://www.shinetsusilicone-global.com/support/sdstds/

6 Packaging

1 kg (square cans), 18 kg (square cans)

ShinEtsu
https://www.shinetsusilicone-global.com/

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