



# SANHO CHEMICAL CO., LTD.

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## TOHMIDE 235-A

TOHMIDE 235-A is an epoxy curing agent of polyaminamide type for epoxy resins, designed for structural adhesives, and grout applications in the construction works. A mixture resin of TOHMIDE 235-A with epoxy resin provide long pot life, and good compatibility with the epoxy resin and many type of the fillers to give the cured products of tough physical characteristics.

### 1.SALES SPECIFICATION

Appearance	: Brown viscous liquid
Viscosity (25°C)	: 8,000~18,000
Colour	: 12 Max.
Amine Value(JIS)	: 390 ± 15
Specific Gravity (25°C)	: 0.97
Flash point	: 232°C

### 2.THE STANDARD MIXING RATIO

The Standard Mixing Ratio of TOHMIDE 235-A with an epoxy resin, whose epoxy equivalent weight is about 190 (for example, "EPIDOTE-823" of the Shell Chemical Company, etc.), is 40~70 parts by weight to 100 parts of the epoxy.

### 3.CURING CHARACTERISTICS

When mixed into a liquid resin of bisphenol-A type, whose epoxy equivalent weight is about 190 (for example, "EPIKOTE-828" of the Shell Chemical Company), curing characteristics of TOHMIDE 235-A was observed as follow :

Epoxy / TOHMIDE 235-A	70 / 30	60 / 40	50 / 50
Peak Exothermic Time (minutes)	260	210	200
Peak Exothermic Temperature (°C)	62	108	90
Gelling Time (approx. minutes)	160	160	160

\*Curing Conditions : Total mass employed = 200gr.

Temperature : 22~23°C



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## 4.MECHANICAL/PHYSICAL PROPERTIES

The cured properties of the same mixtured resin of epoxy and Tohmide235-A was observed as follow after curing them at 23°C.

Epoxy / TOHMIDE 235-A		70 / 30	60 / 40	50 / 50
Tensile Strength	(kgf/mm <sup>2</sup> )	4.5	6.4	5.7
Flexural Strength	(kgf/mm <sup>2</sup> )	9.0	8.7	7.5
Flexural Modulus	(kgf/mm <sup>2</sup> )	2.7×10 <sup>2</sup>	2.5×10 <sup>2</sup>	2.1×10 <sup>2</sup>
Compressive Strength	(kgf/mm <sup>2</sup> )	8.4	7.8	6.8
Izod Impact Strength	((kgf-cm/cm)	2.0	3.9	3.6
Rockwell Hardness	(M Scale)	39	52	32
Heat Distrotion Temperature	(°C)	42	48	48

## 5.LAP SHEAR STRENGH

The resin mix of TOHMIDE 235-A and the same epoxy resin as employed above was applied to hold mild steel plates at 22-23°C , whose surface were treated by sand-blast.LAP SHEAR STRENGTH was measured as follow after leaving the bonded steel plates at 22-23°C for 7 days.

Epoxy / TOHMIDE 235-A	8 / 2	7 / 3	6 / 4	5 / 5	4 / 6
Lap Shear Strength ( kgf/cm <sup>2</sup> )	187	171	166	179	195

## 6.CHEMICAL RESISTANCE OF THE CURED PRODUCTS

Percentage increase in weight of the cured products of TOHMIDE 235-A and the same epoxy resin as employed above were measured as follow after curing them at an ambient temperature , and immersing into following chemical substances.

Immersion time (days)	1 day			7 days			30 days		
	7 / 3	6 / 4	5 / 5	7 / 3	6 / 4	5 / 5	7 / 3	6 / 4	5 / 5
Epoxy / TOHMIDE 235-A (Mixing Ratio by weight)									
Tap Water	0.2	0.1	0.2	0.4	0.5	0.4	1.2	1.5	2.3
5% solution of Salt	0.1	0.2	0.3	0.4	0.4	0.4	1.2	1.3	2.4
10% solution of Caustin soda	0.1	0.2	0.2	0.3	0.4	0.3	1.1	1.2	1.7
10% solution of Ammonia	0.1	0.1	0.2	0.4	0.4	0.4	1.2	1.4	2.4
5% solution of Surfrucic Acid	0.2	1.7	6.4	0.5	3.5	10.2	1.5	7.1	48.3
5% solution of Hydrochloric Acid	0.2	0.6	1.9	0.4	1.1	2.1	1.2	3.0	12.1
Kerocene	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.4	0.4
Isopropylalcohol	0.4	0.6	1.7	0.8	1.2	2.4	1.4	2.4	12.4
Metyliso butylitone	4.2	1.7	1.1	9.9	3.8	2.4	15.3	6.8	11.2