



# SANHO CHEMICAL CO., LTD.

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## TOHMIDE HR-11

TOHMIDE HR-11 is a high viscosity polyaminoamide of epoxy curing agent, it provides good mechanical strength and heat resistance to 110°C, its major applications, encapsulation, civil engineering, mold casting

### 1. SPECIFICATIONS

Appearance	: Brown viscous liquid.
Viscosity (25°C)	: 8,000 ~ 15,000 mPa.s
Colour (Gardner)	: 12 Max.
Amine Value	: 400 ± 15(JIS method)
Specific Gravity	: 0.98 ( 25 / 25°C)
A.H.E.W.	: 95

### 2. RECOMMENDED MIXING RATIO

40 ~ 80 parts by weight to 100 parts of liquid epoxy resin whose epoxy equivalent weight is about 190.

### 3. CURING CHARACTERISTICS

Epoxy resin	: Employed Bisphenol-A type epoxy resin whose EEW is 190.
Total mass	: 100g
Room temperature	: 23°C

Epoxy resin / TOHMIDE HR-11	100 / 67		
Peak exothermic time	120		
Peak exothermic	43		
Gel time (min)	120		

(USE: PE CUP)

Remark: 100gram exothermic not complete cured after 24hr

### 4. PHYSICAL PROPERTIES

The mechanical properties of the cured products of the KINGMIDE 525 and the same epoxy resin as employed above were measured (JIS K6911) as follows:

Epoxy resin / TOHMIDE HR-11	100 / 43	100 / 67	100 / 100
Tensile Strength (kgf/mm <sup>2</sup> )	5.7	5.6	5.2
Flexural Strength (kgf/mm <sup>2</sup> )	9.5	8.7	7.3
Flexural Modulus (kgf/mm <sup>2</sup> )	--	--	--
Compressive Strength (kgf/mm <sup>2</sup> )	8.7	7.7	6.9
Izod Impact Strength (kgf/cm-cm)	1.6	1.7	2.1
Rockwell Hardness (M-scale)	84	72	58
Heat Distortion Temp. (°C)	55	55	46



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### 5. LAP SHEAR STRENGTH

Epoxy resin : Employed Bisphenol-A type epoxy resin whose EEW is 190.

Curing Temperature : 23°C for 7 days

Mild steel plates with sand blast treatment were employed whereon the lap shear strength of the mixtured resin of the epoxy resin and TOHMIDE HR-11 was measured.

Epoxy resin / TOHMIDE HR-11	100 / 43	100 / 67	100 / 100
Lap shear strength (kgf/cm <sup>2</sup> )	163	173	163

### 6. CHEMICAL RESISTANCE

Percentage increase in weight of the cured products of TOHMIDE HR-11 and the same epoxy resin as employed above were measured as follow after being cured at 23°C for 7 days, and immersing into respective chemical substances.

Unit : %

Epoxy resin / TOHMIDE HR-11	100 / 43			100 / 67			100 / 100		
Immersing time ( days)	10	30	160	10	30	160	10	30	160
Tap water (23°C)	0.5	1.1	2.7	0.8	1.5	3.5	1.5	3.1	7.2
5% Salt solution	0.5	1.0	2.5	0.7	1.5	3.3	1.1	2.3	5.7
5% Hydrochloric Acid Solution	0.7	1.3	2.9	1.1	2.1	5.1	8.3	15	34
10% Hydrochloric Acid Solution	0.9	1.4	3.1	1.9	3.4	8.2	11	20	38
10% Caustic Soda Solution	0.4	0.8	2.0	0.6	1.2	2.7	1.1	2.2	4.9
20% Caustic Soda Solution	0.4	0.6	1.5	0.4	0.7	1.8	0.5	1.0	2.6
Isopropanol	0.7	1.2	2.4	1.5	2.8	9.2	9.9	19	29
Toluene	6.8	16	--	15	28	--	--	--	--