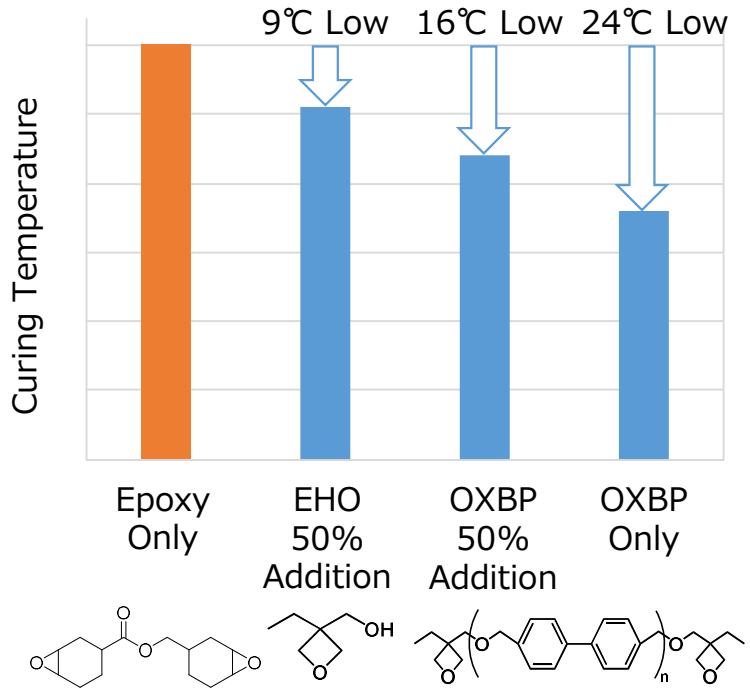
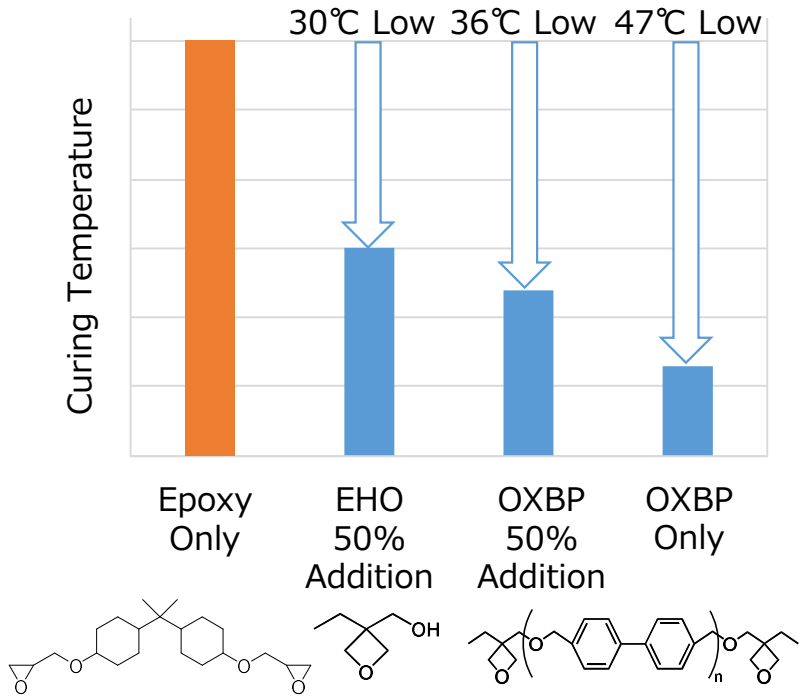
Lower Curing Temperature with Oxetane

The addition of oxetane can improve reactivity and lower the curing temperature in thermo curing epoxy resin. It is expected to lower the temperature in the process, cure fast and reduce the damage on the base material.

Alicyclic Epoxy



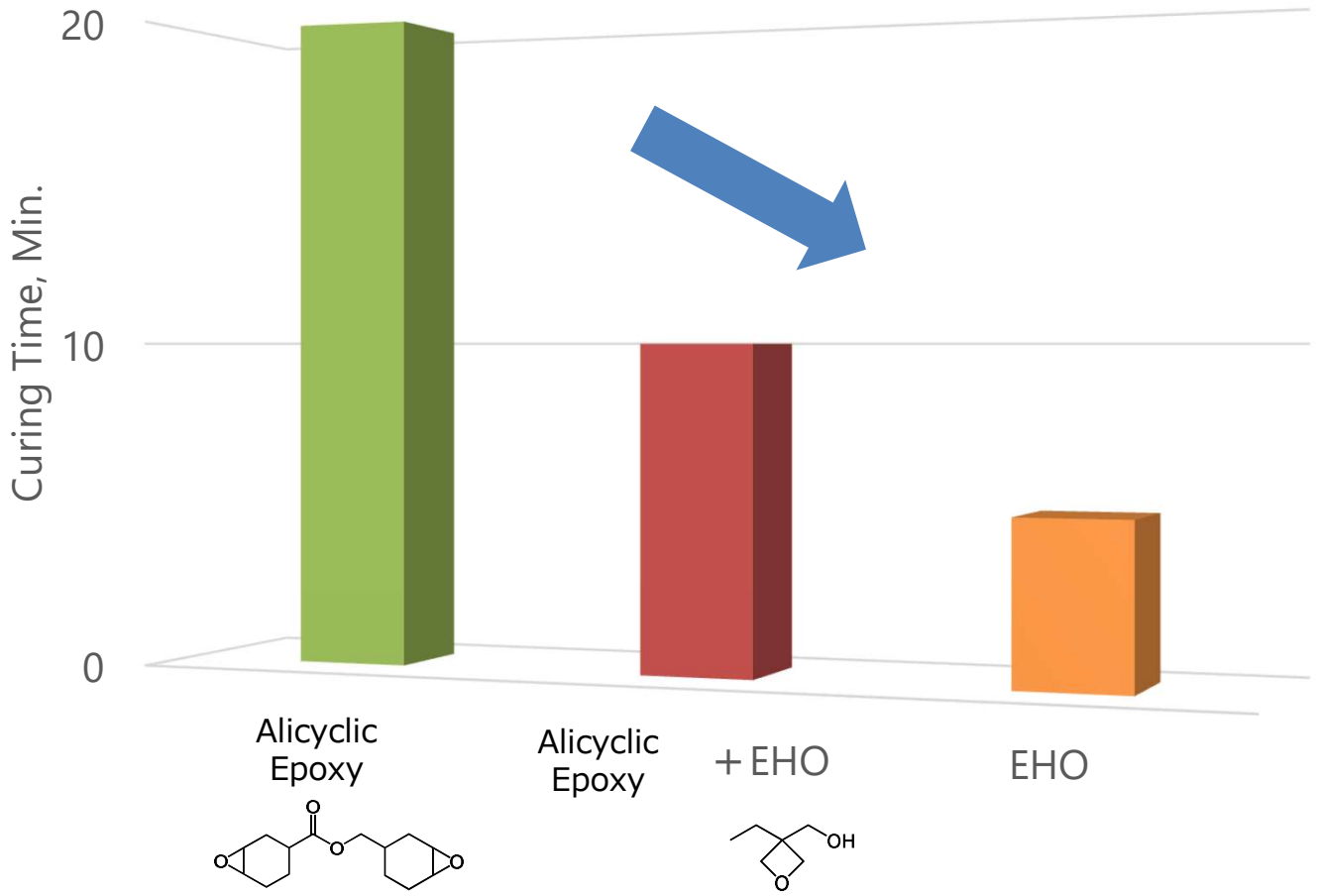
Hydrogenated Bisphenol A type Epoxy



Thermo Acid Generator : SI-100L(Sanshin Chemical Industry Co. Ltd.)
Curing Conditions : 10℃/min from room temperature

Reduction of Curing Time

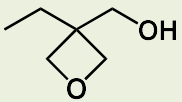
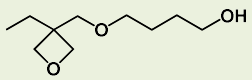
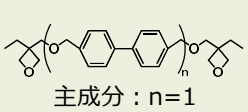
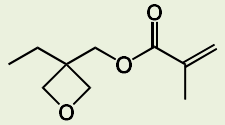
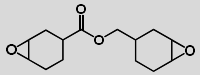
Curing time can be shorten by addition of oxetane into thermo-cationic curing epoxy resin.



Base Resin : Alicyclic Epoxy
Thermo Acid Generator : SI-100L(Sanshin Chemical Industry Co. Ltd.)
Curing Conditions : 100℃
Curing Time : Time that the reaction rate is 90% analyzed by IR

Properties of Thermo Curing Epoxy Resin

Thermo curing alicyclic epoxy tends to be rigid and brittle.
Addition of oxetane makes it possible to soften and lower Tg.

Resin Composition	Oxetane	0%	 **EHO 50%**	 **HBOX 50%**	 主成分：n=1 **OXBP 50%**	 **OXMA 50%**
	Alicyclic Epoxy 	100%	50%	50%	50%	50%
	Viscosity mPa･s	221	**38**	**49**	617	**17**
Physical Properties of Cured Resin	Gel Fraction	100%	100%	99%	100%	87%
	Modulus	3.2 GPa	**2.8 GPa**	**2.2 GPa**	**2.4 GPa**	**2.5 GPa**
	5% Weight Loss Temperature	320 ℃	354 ℃	305 ℃	340 ℃	335 ℃
	WVTR g/m2･Day※	31	11	15	15	20
	Tg	224 ℃	**131 ℃**	**87 ℃**	**192 ℃**	**75 ℃**
	Relative Permittivity (1MHz)	3.90	3.88	3.92	3.56	3.51
	Dielectric Loss Tangent(1MHz)	0.0240	0.0364	0.0242	**0.0202**	0.0217

Thermo Acid Generator : SI-100L(Sanshin Chemical Industry Co. Ltd.)
Curing Conditions : 65℃ 2h→150℃ 1h
※ Conditions : 40 ℃、90%RH