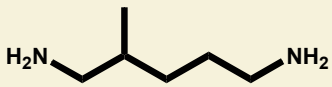
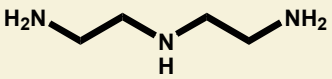
Epoxy Coatings: Curing with DYTEK® A amine vs. DETA

Strong.Speedy. *Sleek*.

The methyl-branched, 5-carbon chain of DYTEK® A amine has two primary amines which exhibit differential reactivity. DYTEK® A amine is used in polyamide resins, hot melt adhesives, polyurethanes and epoxies. DYTEK® A amine is preferred for epoxy coatings when used as a formulated adduct and is particularly useful in the preparation of concrete sealers, glossy decorative floor coatings, flexible coatings, and outdoor applications where fast curing is desired.



DYTEK® A amine
(2-methylpentamethylenediamine)



DETA
(Diethylenetriamine)

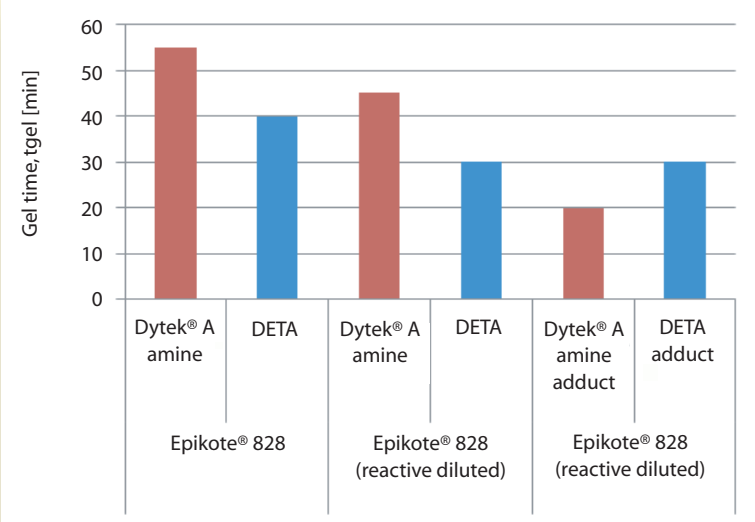
Coating cured with DYTEK® A amine:

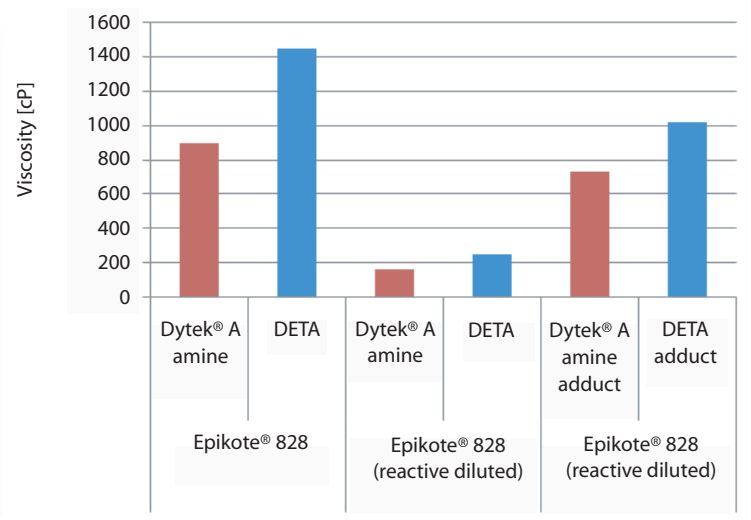
- Low temperature curing and fast curing
  -Allows coating application under adverse environmental conditions and provides fast drying time
- High toughness with increased flexibility
  -Incorporates flexibility into coatings to minimize crack formation

During processing:

- Low viscosity and low adduct viscosity for improved flow and leveling

Dytek®





Formula	Series A		Series B		Series C	
Resin	Epikote® 828		Epikote® 828 (Reactive diluted)[1]		Epikote® 828 (Reactive diluted)[1]	
Amine	DYTEK® A amine	DETA	DYTEK® A amine	DETA	DYTEK® A amine adduct[2]	DETA adduct[2]
Viscosity[3], cP	900	1450	160	250	730	1020
Potlife[4], $t_{40°C}$, min	37	20	20	15	7	10
Gel Time[5], t_{gel}, min	55	40	45	30	20	30
Chemical Resistance	% weight gain after 4 weeks immersion at 23°C					
Demineralized Water	-0.17	0.17	0.29	0.14	1.11	1.20
10% Sodium Hydroxide	0.66	0.95	0.87	0.88	1.54	1.67
10% Hydrochloric Acid	1.56	1.81	4.41	2.61	5.63	3.45
10% Acetic Acid	7.44	1.83	12.52	4.24	30.89	8.96
Gasoline (DIN 51600)	0.20	0.48	0.20	0.39	0.70	0.57
Xylene	0.22	0.48	0.25	0.42	-0.54	0.53
Mechanical properties						
Tg(DSC), 2nd run, °C	115	136	83	95	43	60
Tg(DSC), 1st run, °C	97	117	81	89	38	58
HDT, °C	84.2	90	59.8	78.7	34.7	42.2
Shore D	78	84	78	82	78	82
Charpy, KJ/m^2	14.5	17				
Izod, KJ/m^2	18.5	16				
Flexural Strength, MPa	102	116				
Elasticity Modulus, MPa	2550	2890				
Tensile Strength, MPa	69	81				
Elongation @ Break, %	6.6	7				

[1] The Bisphenol A resin Epikote® 828 is modified with reactive diluent Grilonit® RV 1812.
[2] These adducts were prepared by reacting each diamine with Epikote® 828 resin in benzyl alcohol using a 5:1 molar ratio of diamine to resin.
[3] Viscosity was measured immediately after mixing the resin and amine.
[4] Gel time: Time for a 120 mL sample at 23°C to reach the gel point.
[5] Pot life: Time for a 100 mL sample at 23°C to reach 40°C.