

CURING AGENTS

VERSAMID® POLYAMIDE AND AMINOAMINE CURING AGENTS



GABRIEL

TECHNICAL SELECTION GUIDE

Versamid® EPOXY CURING AGENTS

Product Name	Principal Applications	Comments/Advantages

VERSAMID POLYAMIDE RESINS

VERSAMID® 100 100 IT 60 100 X 65 100 PMX 60	Solvent-based maintenance coatings; used with solid epoxy resins	Fast cure, good chemical resistance
VERSAMID® 115 115 X 70 115I73	Solvent-based maintenance coatings; used with solid epoxy resins and adhesives	Good exibility and corrosion resistance
VERSAMID® 125	Coatings, castings, potting, laminating and adhesives	Medium-viscosity, good chemical resistance
VERSAMID® 140	Coatings, castings, potting, laminating and adhesives	Moderately low-viscosity, excellent chemical resistance
VERSAMID® 150	Coatings, castings, potting, laminating and adhesives	Similar to Versamid® 140 with lower viscosity
VERSAMID® 253	High-solids (+80% NVM) coatings with liquid epoxies	No induction time required, no bloom or blush in
VERSAMID® 280 B 75	Corrosion resistant primers and topcoats	Polyamide/epoxy adduct 75% by weight in n-butanol
VERSAMID® 230 XB 60	Solvent-based coatings	Polyamide/epoxy adduct 60% by weight in n-butanol

VERSAMID G AMIDOAMINE RESINS

VERSAMID® G-151	High-solids coatings, casting, laminates and adhesives	Low-blush, low moisture sensitivity
VERSAMID® G-235	High-solids (90+) coatings, industrial maintenance and marine coatings	Low-viscosity, good corrosion resistance
VERSAMID® G-250	High-solids coatings, castings, laminating and adhesives	Low-viscosity, good adhesion
VERSAMID® G-490	High-solids coatings and castings	Extremely low-viscosity, long pot life
VERSAMID® G-491	High-solids coatings, castings and adhesives	Similar to Versamid® G 490, but faster cure
VERSAMID® G-747	High-solids coatings, castings, potting, laminating, and adhesives	Very low-viscosity
VERSAMID® G-2000	Coatings, castings, potting, laminating, and adhesives	Fast cure, good chemical resistance

⁽¹⁾ Viscosity at 120 °C ⁽²⁾ Viscosity at 75 °C ⁽³⁾ Viscosity at 40 °C ⁽⁴⁾ PHR, parts of curing agent per 100 parts of Epoxy Resin, 190 EEW Epoxy ⁽⁵⁾ With 525 E

Please refer to www.gabrielchem.com for a full listing of products, including the A, C, F, EH and M series products.

	Specifications				Chemical Resistance*						
	Amine Value mg KOH/g	Viscosity (25 °C) P	Max. Color Gardner	10% Acetic Acid	10% HCl	10% H2SO4	10% NaOH	MEK	Xylene	Ethanol	% Solids
	85-95	30-50 ⁽¹⁾	9	—	—	—	—	—	—	—	100
	50-58	8-18	9	—	—	—	—	—	—	—	60
	54-63	20-45 ⁽³⁾	9	—	—	—	—	—	—	—	65
		49-59	9	—	—	—	—	—	—	—	60
	230-246	31-45 ⁽²⁾	8	12.41	1.85	3.24	0.55	DES	DES	13.48	100
	159-175	4-6 ⁽³⁾	8	—	—	—	—	—	—	—	70
	164-182	14-32	8	—	—	—	—	—	—	—	73
	330-360	6.5-9.5 ⁽²⁾	8	6.93	0.80	1.24	0.57	DES	15.47	6.71	100
istance	370-400	80-120	8	11.58	0.92	1.29	0.47	DES	13.36	5.36	100
	370-400	20-40	8	11.57	1.09	1.69	0.52	DES	13.11	6.44	100
high humidity environments	210-235	5-20	8	2.60	0.66	0.89	0.60	DES	13.36	7.40	72
or xylene, meets MIL-P-24441	240-260	43-90	8	—	—	—	—	—	—	—	75
hol or xylene 1:4 by weight	115-130	22-35	8	—	—	—	—	—	—	—	60
	425-450	2.3-4	8	5.80	0.72	0.99	0.37	DES	19.00	8.38	100
	350-400	1-4	8	4.81	0.69	0.89	0.47	DES	DES	8.85	100
	425-450	5-10	8	6.95	0.87	1.36	0.41	DES	15.34	9.38	100
	370-400	1-4	9	5.45	0.65	1.00	0.48	DES	23.52	7.74	100
	500-580	5-10	9	12.29	0.86	1.32	0.41	DES	10.43	4.78	100
	450-475	2-5	9	8.78	0.97	1.49	0.44	DES	13.98	6.59	100
	580-620	10-25	8	15.44	1.60	3.14	0.43	DES	4.94	4.64	100

EW Epoxy Resin (Solid basis) ⁽¹⁾3 wet mils DES = Destroyed *Chemical Resistance = % weight gain after a 7 day 25 °C cure followed by 21 days immersion a

Typical Properties								Mechanical Properties**				
Density (25 °C) lbs/gal	AHEW g/eq	phr for Max. DSC, T _g	T _g (DSC) °C	Pot Life @ 25 °C 60% Solids, Hrs:Min	Tack Free (6) Time @ 25 °C Hrs:Min	Thru-Cure @ 25 °C, Hrs.	Gel Time @ 25 °C 200gm Mass, Hrs:Min	Tensile Strength, psi x 10 ³	Elongation %	Flexural Modulus psi x 10 ³	Flex Strength, psi x 10 ³	Comp Strength, psi x 10 ³
8.1	525	100 ⁽⁵⁾	—	16:00	1:30	48:00	—	—	—	—	—	—
7.6	875	167 ⁽⁵⁾	—	—	—	—	—	—	—	—	—	—
7.8	808	154 ⁽⁵⁾	—	—	—	—	—	—	—	—	—	—
7.8	875	167 ⁽⁵⁾	—	—	—	—	—	—	—	—	—	—
8.1	198	104	62	4:00	4:15	6:00	—	6.0	8.0	320	—	6.9
7.8	283	149	—	—	—	—	—	—	—	—	—	—
7.7	271	143	—	—	—	—	—	—	—	—	—	—
8.1	103	54	84	2:00	5:00	12:00	2:09	6.1	5.0	239	9.7	8.5
8.0	97	51	93	3:30	6:30	12:00	2:15	6.4	3.8	326	13.6	11.4
8.0	103	54	87	2:30	6:30	11:30	1:48	7.8	5.1	330	14.2	10.6
8.3	131	69	41	3:00	7:45	14:00	1:11	5.7	5.3	154	7.5	9.4
8.0	165	87	—	6:00	6:00	24:00	—	—	—	—	—	—
7.8	409	82 ⁽⁵⁾	—	10:00	2:00	>24:00	—	—	—	—	—	—
7.9	91	48	66	3:30	9:00	20:00	1:57	7.4	4.8	434	16.1	8.2
7.8	95	47	66	12:30	15:00	>24:00	3:50	3.3	2.4	293	10.9	6.8
7.9	101	53	63	1:00	6:00	8:00	0:47	6.6	4.6	589	18.6	8.3
7.9	95	50	80	8:00	14:00	>24:00	3:55	6.8	4.6	653	20.4	7.5
7.9	68	36	99	0:45	5:30	23:00	0:34	4.7	2.9	364	20.9	12.3
7.8	93	49	81	3:00	8:00	23:00	1:40	8.4	5.4	304	13.1	7.4
8.2	82	43	92	0:45	4:30	9:00	0:38	10.2	5.0	495	17.7	12.3

CHOOSE FROM A COMPLETE RANGE OF HIGH-QUALITY CURING AGENTS TO MEET YOUR MOST DEMANDING APPLICATIONS

VERSAMID® POLYAMIDE RESINS

Versamid® products have proven to be superior curing agents in many applications, such as industrial maintenance and marine coatings, high-performance architectural paints, high-solids and conventional coatings.

ADVANTAGES

- Highly resistant to chemical and water corrosion
- Strong adhesion to a variety of substrates
- Long pot life
- Lower sensitivity to substrate impurities
- Most comply with FDA regulations

VERSAMID® G AMIDOAMINE RESINS

Versamid® G curing agents offer many of the same application benefits as Versamid® polyamides, along with lower viscosity. High system solids and as low as zero VOC compositions can be produced.

ADVANTAGES

- Superior wetting characteristics when compared to aliphatic amines, aromatic amines, and anhydrides
- Good adhesion
- Excellent chemical resistance
- Tougher, less toxic and non-migrating in preference to amine or polyamine epoxy coreactants
- Fast cure time—Both Versamid® and Versamid® G curing agents cure epoxy agents at room temperature in several hours or at elevated temperatures in several minutes

Parameter	Polyamide	Amidoamine	Modified Amine
Stoichiometry	Not critical	Not critical	Critical
Pot-life	Long	Long	Short
Coating cure speed	Low	Low-medium	High
Viscosity	High	Medium	Low
Flexibility	High	Medium	Low
Hardness	Low	Med-low	High
Corrosion Protection	High	High-med	Low
Through cure	Medium	High	Low

VERSAMID® OUTPERFORMS OTHER CURING AGENTS

Versamid® curing agents include reactive polyamide resins, amidoamines and modified amines designed for use with solid or liquid epoxy resins to provide tough, chemical-resistant, thermoset coating applications that cure at room temperature. These materials also find use in adhesive applications.

Versamid® curing agents offer unique combinations of hardness and flexibility along with the highest chemical and solvent resistance of the dimer-based polyamide resin series.



VERSAMID® CURING AGENTS ARE RECOMMENDED FOR APPLICATIONS SUCH AS:

- Joint sealants
- NSF potable water coatings
- Potting and encapsulation
- Patching compounds
- Maintenance coating applications
- Primers
- High solids enamel paint formulations

**GET IN TOUCH
WITH GABRIEL**

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