

ANCAMINE® 2726 Curing Agent**DESCRIPTION**

Ancamine 2726 curing agent is a modified cycloaliphatic amine adduct intended for use at ambient temperatures with liquid epoxy resins. Ancamine 2726 curing agent provides an excellent balance of properties in terms of handling, cure speed and UV durability.

BENEFITS

- Excellent color and color stability
- Non-blushing
- High gloss films
- Good chemical resistance

APPLICATIONS

- Self-leveling and screed floorings
- Solvent-free and high solid floor and wall coatings
- High solid coatings for metal protection
- Tile grouts

SHELF LIFE

At least 24 months from the date of manufacture in the original sealed container at ambient temperature. Store away from excessive heat and humidity in tightly closed containers. Do not freeze.

STORAGE AND HANDLING

Refer to the Safety Data Sheet for Ancamine 2726 curing agent.

TABLE 1: TYPICAL PROPERTIES

Appearance:	Clear, Light Yellow Liquid
Color¹ (Gardner)	max 2
Viscosity² @ 25°C (mPa.s)	300-600
Specific Gravity @ 21°C	1.03
Amine Value³ (mg KOH/g)	240-290
Equivalent Wt/{H}	115
Recommended Use Level⁴ (phr)	60

TABLE 2: TYPICAL HANDLING PROPERTIES⁴

Gel Time⁵ (150g mix @ 25°C) (min)	40-50
Thin Film Set Time⁶ @ 23°C (h)	7.0
Hardness Shore D⁷ @ 23°C (24h)	85
Hardness Shore D⁷ @ 15°C (24h)	78
Typical Cure Schedule	2-7 Days

* Cured with liquid Bisphenol-A based epoxy resin (EEW=190).

Footnotes:

- (1) ASTM D 1544-80
- (2) Brookfield RVTD, spindle 4
- (3) Perchloric Acid Titration
- (4) Seta CC
- (5) Techne GT-3 Gelation Timer
- (6) ASTM D 5895 Stage III

SUPPLEMENTARY DATA

This below data provides additional information on the cure and performance properties of Ancamine 2726 curing agent versus Ancamine 1618 curing agent. Ancamine 2726 curing agent was screened with non-diluted and diluted resins. The results in Table 1 show comparable performance to Ancamine 1618 curing agent

TABLE 1: ANCAMINE 1618 AND ANCAMINE 2726 CURING AGENT CURE PERFORMANCE

DGEBA, undiluted EEW190	Temp. /°C		1618	2726
GT, 150g	23	min	51	54
TFST, phase 2/3		h	6.3/7.8	6.0/7.6
Persez, d1/d7		s	290/340	290/340
Hardness, d1/d7		Shore A/D	84D/84D	85D/85D
Carb. Resist, d1		1-5, 5=Best	3	4-5
TFST, phase 2/3	15	h	10/13	11/14
Persez, d2/d7		s	215/270	210/270
Hardness, d1/d2/d7		Shore A/D	76D/83D/84D	78D/83D/84D
Carb. Resist, d2		1-5, 5=Best	3	2
DGEBA, undiluted EEW190	Temp. /°C			
GT, 150g	23	min	88	77
Mix Viscosity		mPa.s	630	625
TFST, phase 2/3		h	8.7/12	9.0/11
Gloss 20°/60°			92/98	100/101
Hardness, 24h/7d		Shore A/D	50D/79D	67D/82D
Carb. Resist, d1	1-5, 5=Best	4	4-5	
TFST, phase 2/3	15	h	16/20	15/20
Gloss 20°/60°			7/44	36/86
Persez, d2/d7		s	40/70	45/75
Hardness, d1/d2/d7		Shore A/D	60A/62D/77D	75A/67D/79D
Carb. Resist, d2		1-5, 5=Best	2	4

The UV resistance of Ancamine 2726 curing agent was compared to Ancamine 1618 curing agent by measuring the yellowing index of thin films exposed to UV over 150 hours. As shown in Figure 1, the UV resistance of Ancamine 2726 curing agent is not significantly different than the UV resistance of Ancamine 1618 curing agent (Figure 1). In addition to UV resistance, films were also examined for carbamation resistance at 15°C and 25 °C. As shown in Figure 2, both curing agents provide high gloss films at room temperature with only Ancamine 1618 showing a low amount of carbamation. The carbamation is present at 15°C, but is comparable to other cycloaliphatic curing agents in this class. The carbamation resistance at 15°C can be improved significantly by utilizing a diluent such as Epodil 748 diluent at 10 wt%.

FIGURE 1: YELLOWING INDEX VERSUS UV EXPOSURE TIME

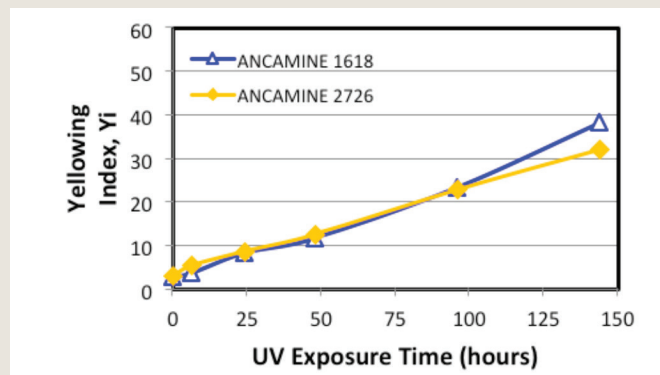
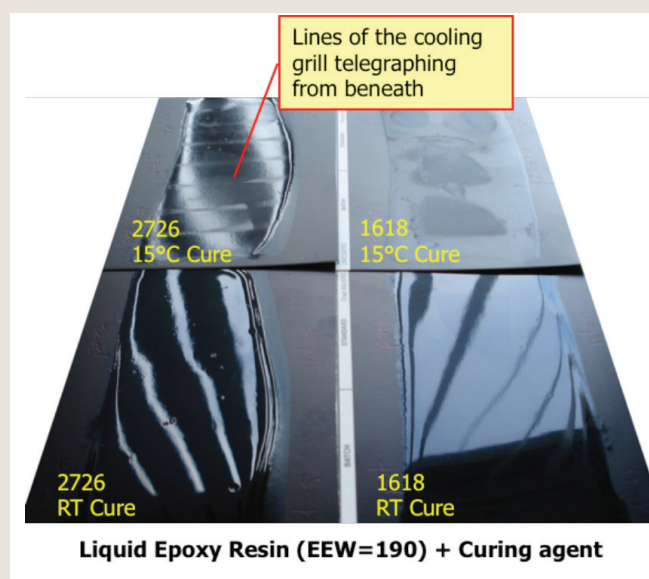


FIGURE 2: FILMS CURED AT 15°C AND 25°C



SUPPLEMENTARY INFORMATION FOR METAL PROTECTION

Ancamine 2726 curing agent is low viscosity, modified cycloaliphatic amine. The product is intended for use with a variety of epoxy resin types in the development of high performance, corrosion resistant coatings for the protection of steel and concrete.

In addition, Ancamine 2726 curing agent exhibits excellent compatibility with liquid epoxy resins and therefore high solid, solvent based coatings can be formulated using this product, which can then be used for a wide variety of industrial maintenance and marine applications.

Formulations based on Ancamine® 2726 curing agent can also be accelerated to enhance dry speed both at ambient and low temperature, using Ancamine® K54 (phenolic, tertiary amine accelerator).

STARTING POINT FORMULATIONS: Appendix 1 contains preliminary starting point formulations based on Ancamine® 2726 curing agent for an anti-corrosive primer.

Formulation A2726P1 is a high volume solids (76%), anti-corrosive primer, based on a combination of liquid bisphenol A diglycidyl ether (EEW 190) and solid epoxy resin solution (EEW=550). The formulation has a 1:1 mix ratio by volume. The initial viscosity of the formulated system is ~2,000 mPa.s with a total VOC of 210 g/l. The primer formulation is compatible with a variety of different let down solvents (including xylene, n-butanol, MIBK, methoxy-propanol, etc) and can be further let down if required for additional spray applications. The coating formulation can be applied with conventional spray equipment or brush applied to the steel substrate and has a pot life of 3 hrs.

Formulation A1618P1 is a high volume solids (76%), anti-corrosive primer, based on a combination of liquid bisphenol A diglycidyl ether (EEW 190) and solid epoxy resin solution (EEW=550). The formulation has a 1:1 mix ratio by volume. The initial viscosity of the formulated system is 2,000 mPa.s with a total VOC of 210 g/l. The primer formulation is compatible with a variety of different let down solvents (including xylene, n-butanol, MIBK, methoxy-propanol, etc) and can be further let down if required for additional spray applications. The coating formulation can be applied with conventional spray equipment or brush applied to the steel substrate and has a pot life of 3 hrs.

The above formulations have been evaluated for corrosion resistance properties using salt spray and Cleveland Humidity test. After 2,000 hrs exposure, the coatings exhibit excellent corrosion resistance. For comparative purposes, Ancamine 1618 curing agent was also included in the test study as the

“industry” standard reference. In all the corrosion resistance tests carried out, both Ancamine 2726 and Ancamine 1618 curing agents demonstrated comparable performance.

PERFORMANCE EVALUATION: All coatings were evaluated in 5% salt spray, and in continuous humidity at 35°C.

The primer were applied to grit blasted, hot rolled steel (SA2.5), using conventional spray equipment, in double coats to give coatings with a 75-100µ (3-4 mils) dry film thickness (DFT). In salt spray, (ASTM B-117) panels were scribed and evaluated for field blisters using the US Federal Standard Test Method 141a, Method 6461 and the scribe creep was rated in accordance with ASTM D-1654.

CORROSION RESISTANCE: Anti-corrosion resistant primers based on Ancamine 2726 and Ancamine 1618 curing agents, were evaluated for salt spray and constant humidity resistance. The results obtained are presented in Table 2 and Table 3.

**TABLE 2: SALT SPRAY RESISTANCE —
ANCAMINE 2726 AND ANCAMINE 1618 SYSTEMS**

Formulation	Scribe Creep		Field Blistering	
	1,000 hrs	2,000 hrs	1,000 hrs	2,000 hrs
A2726P1	10	8	10	10
A1618P1	10	8	10	10

5% salt spray, cabinet temperature 35°C - ASTM B-117, film thickness 75-100µ Rating: ASTM D714: 10 = Best (no blisters), 0 = Worst, F= fe

**TABLE 3: CLEVELAND HUMIDITY —
ANCAMINE 2726 AND ANCAMINE 1618 SYSTEMS**







Formulation	Field Blistering	Appearance
A2726P1	10	No defects
A1618P1	10	No defects

Continuous 100% humidity exposure - ASTM D-2247, cabinet temperature 50°C Film thickness 75-100µ. Rating: 10 = Best, 0 = Worst For blister size, rating 10 = no blisters observed

PERFORMANCE RESULTS: Ancamine 2726 curing agent can readily be formulated into a wide range of anti-corrosive primers and top coats depending upon the epoxy resin system required. General handling properties of the formulated coatings are comparable to Ancamine 1618 curing agent and coatings can easily be applied using a range of application methods such as brush, roller and spray application. In accelerated weather testing, corrosion resistance indicates that Ancamine 2726 curing agent delivers the high level of corrosion resistance typically observed for this class of curing agent. Resistance up to 2,000 hrs resistance was easily achieved for all systems tested with no noticeable damage around the scribe during this period.

**CORROSION AND HUMIDITY RESISTANCE FOLLOWING 2,000 HRS
ACCELERATED SALT SPRAY (ASTM B117) EXPOSURE**

ANTI-CORROSIVE PRIMER A2726P1 AND A1618P1

	Salt Spray ASTM B117 After 2,000 Hours		Cleveland Humidity Test After 2,000 hours	
	A2726P1 Ancamine 2726	A1618P1 Ancamine 1618	A2726P1 Ancamine 2726	A1618P1 Ancamine 1618
Before Scribe Creep	 <p align="center">Field 10 Scribe 8</p>	 <p align="center">Field 10 Scribe 8</p>	 <p align="center">Field = 10</p>	 <p align="center">Field = 10</p>
After Scribe Creep	 <p align="center">Field 10 Scribe 8</p> <p align="center">Creep 3mm</p>	 <p align="center">Field 10 Scribe 8</p> <p align="center">Creep 3mm</p>		

NOTE: Coatings applied using conventional spray equipment. 2 coatings applied to achieve total dry film thickness 75-100 μ

APPENDIX I: PRIMER FORMULATIONS FORMULATION A2726P1

Anti-Corrosive Primer

A-COMPONENT (G)			
1. Epoxy Resin	Bis A diglycidyl ether (EEW550)		9.58
2. Epoxy Resin	Bis A diglycidyl ether (EEW190)		19.66
3. Reactive Diluent	Epodil 742		2.95
4. Additive	Anti-Terra U80		0.49
5. Additive	Bentone SD2		0.79
6. Additive	Aerosil 200		0.20
7. Pigment	Heucophos ZP10	Heubach	4.86
8. Filler	Bayferrox 130M	Bayer	7.86
9. Filler	Quartz # 400 mesh		45.50
10. Additive	Epodil LV5	Evonik	2.95
11. Solvent	PM Solvent		2.95
12. Solvent	Xylene		2.21
B-COMPONENT (G)			
1. Curing Agent	Ancamine 2726	Evonik	15.21
2. Additive	Anti-Terra U80		0.36
3. Additive	Bentone SD2		2.40
4. Additive	Cymel 303		2.60
5. Filler	Quartz # 400 mesh		55.28
6. Additive	Aerosil 200		0.36
7. Solvent	PM Solvent		9.01
8. Additive	Epodil LV5	Evonik	3.03
9. Additive	Ancamine K54	Evonik	0.36
10. Solvent	Xylene		11.39
TOTAL (A+B)			200.00

For conventional spray application requires 10 to 15 % dilution

TECHNICAL DATA					
Mixing ratio	Weight Volume	100 A :83 B 1:1	Solid Content (Volume %)	- Part A	90.21
				- Part B	66.11
				- Mix	76.48
			Mix Viscosity ¹ @ 25°C	mPa.s	2,000
Density (g/ml)	- Part A	1.61	VOC	g/L	210
	- Part B	1.35	PVC	%	49.50
	- Mix	1.48			
Solid Content (Weight %)	- Part A	92.35			
	- Part B	77.93			
	- Mix	85.80			

APPENDIX I: PRIMER FORMULATIONS FORMULATION A1618P1

Anti-Corrosive Primer

A-COMPONENT (G)			
1. Epoxy Resin	Bis A diglycidyl ether (EEW550)		9.58
2. Epoxy Resin	Bis A diglycidyl ether (EEW190)		19.66
3. Reactive Diluent	Epodil 742		2.95
4. Additive	Anti-Terra U80		0.49
5. Additive	Bentone SD2		0.79
6. Additive	Aerosil 200		0.20
7. Pigment	Heucophos ZP10	Heubach	4.86
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Density (g/ml)	- Part A	1.61	VOC	g/L	210
	- Part B	1.35	PVC	%	49.50
Solid Content (Weight %)	- Mix	1.48			
	- Part A	92.35			
	- Part B	77.93			
	- Mix	85.80			

EVONIK CORPORATION

7201 Hamilton Blvd.
Allentown, PA 18195
1 800 345-3148
Outside U.S. and Canada 1 610 481-6799

For Technical Information and Support:

Americas: picus@evonik.com
EMEA: apcse@evonik.com

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