

Technical Data Sheet

EPIKURE™ Curing Agent 8537-WY-60

Product Description

EPIKURE™ Curing Agent 8537-WY-60 is a water reducible amine adduct supplied at 60 percent solids in water. When combined with suitable epoxy resins, waterborne coatings may be formulated to meet a variety of end use requirements.

Application Areas/Suggested Uses

- Trade sales – sealers, primers, block fills, masonry coatings, asphalt coatings, enamels.
- Industrial maintenance – sealers, primers, block fills, masonry coatings, enamels.
- Industrial finishes – low temperature bake primers and enamels.

Application

For spray applications, additional reduction with water may be desired, although it is not necessary because of the excellent atomization properties of these coatings. Reasonably high film build coatings may be achieved with spray application. A finishing system providing a final film build averaging 7 mils would consist of a primer (2.5 mils), an intermediate coat (3.0 mils) and a gloss enamel (1.5 mils), all based on EPIKURE Curing Agent 8537-WY-60.

Benefits

- Low VOC coatings
- Water cleanup
- Overnight recoat
- Resistance to flash rusting
- Solvent resistance comparable to solvent based epoxy systems
- Good color
- Excellent sealing over fresh concrete and damp masonry
- Acceptance of universal machine colorants
- Seals wood surfaces without raising nap
- Bridging of voids and freedom from mud cracking in block fill coatings
- No bleed-through over asphaltic surfaces
- Excellent film properties at low temperature bakes
- Early resistance to wash-off and water spotting
- Adhesion to various substrates:
 - Untreated and treated cold-rolled steel
 - Electrolytic and hot dip galvanized metal
 - Aluminum
 - Aged alkyd and epoxy enamel films

Sales Specifications

| Property | Value | Unit | Test Method |
|-----------------|-----------|---------|-------------|
| Amine Value | 310 - 360 | mg/g | ASTMD2896 |
| Color | 9 | Gardner | ASTMD1544 |
| Solids | 59 - 61 | % m/m | ASTMD1259 |
| Viscosity @25°C | Z-Z4 | | ASTMD1545 |

Typical Properties

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| Property | Value | Unit | Test Method |
|----------------------|-------|------|-------------|
| Density Solution | 9 | | |
| Density Solids | 9.75 | | Calculated |
| Equivalent Weight | 174 | | |
| Flash Point Setflash | >200 | °F | |

Performance Properties

Table 1/ Effects of accelerators on white enamel cured with EPIKURE Curing Agent 8537-WY-60

| Viscosity (Krebs units) after inducing: | | | | | | |
|---|-------|----------|--------|----------|----------|--------|
| White enamel (100 gallons) | Fresh | 1 hr. | 2 hrs. | 3 hrs. | 5 hrs. | 7 hrs. |
| Without accelerator | 100 | 100 | 102 | 104 | 130 | >141 |
| With 2 lbs. DMP-10 | 103 | 108 | 112 | 115 | >141 | gel |
| With 5 lbs. DMP-10 | 107 | 116 | 130 | >141 | semi-gel | gel |
| With 10 lbs. DMP-10 | 112 | 122 | >141 | semi-gel | gel | – |
| With 2 lbs. DMP-30 | 115 | >141 | gel | – | – | – |
| With 5 lbs. DMP-30 | 120 | semi-gel | gel | – | – | – |

| | Pencil hardness after: | | | Print resistance | |
|---------------------|------------------------|---------|-----------|--------------------------|--|
| | 20 hrs. | 40 hrs. | 60° Gloss | 2 lbs./sq. inch, 4 hours | |
| Without accelerator | 6B | 2B | 100 | severe | |
| With 2 lbs. DMP-10 | 5B | 1B | 100 | slight | |
| With 5 lbs. DMP-10 | 5B | 1B | 98 | slight | |
| With 10 lbs. DMP-10 | 5B | 1B | 98 | slight | |
| With 2 lbs. DMP-30 | 4B | 1B | 97 | slight | |
| With 5 lbs. DMP-30 | 4B | HB | 98 | very light | |

General Information

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The epoxy resin portion most commonly used with EPIKURE Curing Agent 8537-WY-60 is a liquid epoxy (WPE 190) such as EPON™ Resin 828 in combination with a reactive diluent such as HELOXY™ Modifier 8. When used with this epoxy resin blend, EPIKURE 8537-WY-60 produces cured films at room temperature and low temperature bakes that possess excellent gloss, hardness, and resistance to solvents, water, and alkali. EPIKURE Curing Agent 8537- WY-60 may also be used in combination with EPI-REZ™ Resin 3520-WY-55, which combines the above performance feature with fast dry times. (Refer to EPI-REZ 3520-WY-55 product bulletin for details.)

Coatings based on EPIKURE 8537-WY-60 can be formulated into easily handled two-package systems. These systems blend as easily as their solvent-based counterparts. Application by brush, spray and roller coating are all remarkably free of bubbling and other film imperfections.

A feature of this system is the ability of films to cure fully when applied to damp masonry surfaces. Overnight recoating is possible even under these adverse conditions with most formulations. Block fill formulas permit the applications of a complete water-base system, circumventing the long troublesome field problem of loss of intercoat adhesion when using a latex block fill with an epoxy top coat under damp conditions. This curing agent, when used in clear coatings, provides excellent sealing over such porous substrates as wood and wallboard. Because such coatings are very low in organic volatiles, they are actually more odor-free than typical PVA and acrylic interior wall paints.

Performance Characteristics

A feature of two-component water reducible epoxy systems based on EPIKURE Curing Agent 8537-WY-60 is the ability to cure even when applied over damp concrete surfaces. It has been demonstrated that a white enamel using this curing agent, when applied to a concrete block partially submerged in water for 2 days, will cure sufficiently hard overnight to allow successful recoating. Such cure schedules are achieved despite the fact that the block remained partially submerged in water. This performance characteristic should make this system an ideal candidate for use over damp concrete substrates and all below grade surfaces where moisture is a problem.

Systems based on EPIKURE Curing Agent 8537-WY-60 exhibit excellent adhesion to such varied substrates as galvanized metal (electrolytic and hot dip processes), cold-rolled steel (untreated and iron phosphate treated) and untreated aluminum. Flash rusting is not a problem over cold-rolled steel.

Adhesion is also excellent to aged alkyd and epoxy ester enamel films. The coating of wood surfaces, such as fir, plywood and yellow pine, provides excellent sealing and freedom from nap raising. The self-sealing qualities of this curing agent are demonstrated by the excellent sealing efficiency over wallboard.

Enamels based on EPIKURE Curing Agent 8537-WY-60 can be applied to an asphaltic surface without staining or bleed-through. This property suggests its use in striping paints.

Clear coatings have been applied over fresh concrete, suggesting possible application as a sealer to retard evaporation of water and insure better cure of the concrete.

Table 2/ Effects of adding of acetic acid to white enamel based on EPIKURE™ Curing Agent 8537-WY-60

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| Pounds of acetic acid added to 100 gallons white enamel | Fresh | 1 | Viscosity, Krebs units – hours induction: | | | | | | | | 48 | 72 |
|---|-------|-----|---|-----|-----|-----|-------|-------|-------|-------|-------|----|
| | | | 2 | 3 | 4 | 5 | 6 | 24 | 32 | | | |
| None | 97 | 114 | 119 | 129 | 123 | 135 | fluid | gel | – | – | – | |
| 3 lbs. | 86 | 92 | 106 | 110 | 117 | 128 | fluid | gel | – | – | – | |
| 6 lbs. | 75 | 82 | 91 | 97 | 104 | 110 | 120 | fluid | gel | – | – | |
| 9 lbs. | 63 | 63 | 67 | 70 | 71 | 73 | 74 | 129 | fluid | gel | – | |
| 12.5 lbs. | 63 | 64 | 67 | 69 | 71 | 73 | 74 | 125 | fluid | gel | – | |
| 15.0 lbs. | 63 | 63 | 64 | 65 | 71 | 72 | 74 | 114 | 130 | fluid | gel | |
| 18.0 lbs. | 63 | 63 | 65 | 65 | 64 | 64 | 71 | 98 | 100 | 134 | fluid | |
| 22.0 lbs. | 62 | 64 | 64 | 65 | 63 | 63 | 69 | 80 | 82 | 106 | 118 | |

| | Pencil hardness after: | | | | | Gloss (60°) after: | |
|-----------|------------------------|----------------|---------|--------|--------------------|--------------------|--------|
| | 24 hrs. | 48 hrs. | 72 hrs. | 1 week | 30 mins. at 200 °F | 24 hrs. | 1 week |
| None | 4B | HB | F | 3H | 4H | 100 | 100 |
| 3 lbs. | 4B | 2B | B | H | 4H | 100 | 99 |
| 6 lbs. | 6B | 2B | B | H | 4H | 99 | 94 |
| 9 lbs. | tacky | 3B | B | H | 4H | 100 | 95 |
| 12.5 lbs. | tacky | 3B | B | H | 4H | 95 | 95 |
| 15.0 lbs. | tacky | 5B | 3B | HB | 4H | 97 | 95 |
| 18.0 lbs. | tacky | 6B | 5B | HB | 4H | 91 | 87 |
| 22.0 lbs. | tacky | slightly tacky | 6B | HB | 4H | 75 | 70 |

Formulating

Pigmentation is usually carried out in the curing agent portion, offering a 4:1 packaging ratio. When dispersing pigment in the curing agent, it is necessary to avoid excessive heat generation. If grinding in the epoxy portion is preferred, the pigment can be readily dispersed in the liquid resin. Such a system would yield a 3:1 ratio of the two components.

A ratio of 75:25 by weight of EPON Resin 828 and HELOXY Modifier 8 provides a good balance between viscosity and cure response. Higher

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diluent content will result in poor cure response.

Equal volume ratios of the two components can be achieved by addition of surfactant and water in the epoxy portion. The surfactant will reduce the water resistance properties.

Varying the ratio of epoxy resin and curing agent solids from 54:46 to 44:56 will provide additional cure response and solvent resistance at the expense of pot life which will be shortened to as little as 2 hours.

Overnight cure response can be improved by the use of dimethylaminomethylphenols such as DMP-10 and DMP-301. These epoxy resin accelerators are water miscible and compatible with EPIKURE Curing Agent 8537-WY-60. DMP-10 is less reactive than DMP-30. Therefore, it has less effect on pot life with equal overnight cure response to DMP-30. As shown in Table 1, levels of DMP-10 must be kept to a minimum. Amounts in excess of 2 pounds per 100 gallons of enamel severely curtail useable pot life. Even though pencil hardness data do not signify great improvements, there is improvement in print resistance, indicative of better overnight cure. A slight decrease in water resistance may result when accelerators or additional curing agent is employed.

Baking Finishes

EPIKURE Curing Agent 8537-WY-60 exhibits excellent properties in both primers and enamels when cured at elevated temperatures for short periods of times. Excellent cure response is achieved on schedules of 30 minutes at 200 °F. White enamels cured on these schedules will produce films with a pencil hardness of 3H, resistance to MEK, high gloss, adhesion and mar resistance.

Table 3 demonstrates cure response at various elevated temperatures

| Bake Schedule | Pencil hardness | Gloss | Solvent resistance to: | |
|----------------------|-----------------|-------|------------------------|-----------|
| | | | Xylene | MEK |
| 15 minutes at 200 °F | 1F | 97 | softens | excellent |
| 30 minutes at 200 °F | 3H | 98 | excellent | excellent |
| 20 minutes at 210 °F | 1H | 95 | excellent | excellent |
| 10 minutes at 225 °F | 4H | 94 | excellent | excellent |
| 15 minutes at 250 °F | 4H | 94 | excellent | excellent |
| 15 minutes at 275 °F | 4H | 95 | excellent | excellent |
| 15 minutes at 300 °F | 4H | 91 | excellent | excellent |

Colorant Acceptance

Formulas utilizing EPIKURE Curing Agent 8537-WY-60 readily accept the Color Trend #8800 Universal Machine Colorants². Gloss and cure response are not adversely affected by color additions, even with amounts as high as 8 fluid ounces of colorant per gallon of paint. Universal colorants with a pH of less than 7 may reduce cure speed due to their ability to further neutralize the amine functionality of the curing agent.

Safety, Storage & Handling

Please refer to the MSDS for the most current Safety and Handling information.

Please refer to the Hexion web site for Shelf Life and recommended Storage information.

Exposure to these materials should be minimized and avoided, if feasible, through the observance of proper precautions, use of appropriate engineering controls and proper personal protective clothing and equipment, and adherence to proper handling procedures. None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheet (MSDS) for these and all other products being used are understood by all persons who will work with them. Questions and requests for information on Hexion Inc. ("Hexion") products should be directed to your Hexion sales representative, or the nearest Hexion sales office. Information and MSDSs on non-Hexion products should be obtained from the respective manufacturer.

Packaging

Available in bulk and drum quantities.

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Pot Life

Normal useable pot life will be 5 to 6 hours with most formulations at temperatures ranging from 70 to 100 °F. Gelation will occur at 8 to 10 hours.

The pot life of EPIKURE Curing Agent 8537-WY-60 systems can be extended by the incorporation of additional amounts of glacial acetic acid. Table 2 illustrates a test series, in which seven different levels of acetic acid were added to the curing agent (as supplied) to show that the pot life of a white enamel can be extended up to 48 to 72 hours.

The room temperature cure response is affected by the incorporation of acetic acid. The low levels of 3 and 6 pounds of acid yield slightly softer but tack-free films following overnight cure. Films containing in excess of 6 pounds of acid exhibit tacky films overnight but cure to satisfactory hardness in 3 days. Cure response is not affected when films are heat cured.

Contact Information

For product prices, availability, or order placement, please contact customer service:

www.hexion.com/Contacts/

For literature and technical assistance, visit our website at www.hexion.com

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