

## Epoxy Curing Agents and Modifiers

# Anquamine® 731 Curing Agent

## Technical Datasheet

### Description

Anquamine® 731 is a water-based curing agent is specifically designed for a standard liquid epoxy resin. It is specifically designed for cost-effective high-film build concrete coatings. It is particularly suitable for water-based self-leveling systems. Anquamine 731 curing agent easily emulsifies standard liquid epoxy resins without the need for emulsifiable or pre-emulsified epoxy resins.

### Advantages

- Cost Effective
- Rapid Hardness Development
- Excellent Adhesion to Concrete
- Low Color and good yellowing resistance
- Excellent surface appearance even at low temperature cure
- Zero VOC

### Applications

- Self leveling floors
- Mortars
- Grouts

### Storage Life

At least 12 months from date of manufacture in original sealed container at ambient temperature. Store away from excessive heat and humidity in tightly closed containers.

### Handling Precautions

Refer to the Material Safety Data Sheet on Anquamine 731 curing agent.

### Typical Properties

Appearance	Amber Liquid
Color <sup>1</sup> (Gardner)	4
Viscosity <sup>2</sup> @ 77 °F (cPs)	50,000
Amine Value <sup>3</sup> (mg KOH/g)	175
Specific Gravity @ 77 °F	1.06
Total solids content (wt %)	55
Equivalent Wt{H}	200
Recommended Use Level, (phr EEW 190)	100

### Typical Handling Properties\*

Pot Life	30-45 min*
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### Typical Performance\*

1 day Shore D (25 °C 55% RH)	70
7 day Shore D (25 °C 55% RH)	75
1 day Shore D (10 °C 50% RH)	60
7 day Shore D (10 °C 50% RH)	75
Compressive Strength <sup>4</sup> (psi)	5,800
Tensile Strength (psi)	1200

\* Self-leveling starting point formulation

1. ASTM D 1544-80
2. Brookfield RVTD, spindle 4
3. Perchloric Acid Titration
4. ASTM C 579 (1" cube)

### Typical Cure Schedule

Two to seven days at ambient temperature.

## **Curing Agent Characteristics**

Anquamine® 731 water-based curing agent is specifically designed for use in water-based high film build applications, such as self-leveling, mortar or grout applications. High-film build applications often suffer from shrinkage and ultimately cracking of the coating system caused by the evaporation of water in the system. Anquamine 731 curing agent allows the formulation of self leveling systems without cracking.

The use of self leveling flooring is commonly used in concrete protection offering optimum handling properties and maximum protection of the concrete in terms of wear and tear, abrasion and chemical resistance. In self leveling systems with Anquamine 731 curing agent, the formulation binder content can be reduced compared to solvent free systems to yield a high performance water-based self leveling system, thus providing a cost effective, optimum handling and high performance concrete protection system.

Self leveling formulations based on Anquamine 731 curing agent provide a desirable satin-finish to yield good cleanability at reduced scratch sensitivity. In addition, this system provides high resistance to impact, e.g. from falling heavy objects. Upon impact a 'dent' but no cracking will occur so that concrete will be protected without extensive repair work.

Anquamine 731 curing agent is solvent and plasticizer free allowing for the increasingly stringent emission standards to be met.

## **Formulation Guidelines**

### **Recommended Epoxy Resins**

Anquamine 731 curing agent exhibits good compatibility with liquid epoxy resins based on Bisphenol A or F and is equally suitable in either unmodified or modified form. Reactive diluent modified epoxy resin will offer improved handling and formulating latitude within the self-leveling system. It is recommended to use a monofunctional diluent such as Epodil® 748 diluent at up to 15%. Alternatively, difunctional reactive diluents such as Epodil 757 can be used.

### **Defoamer/Wetting agents**

Defoamers such as Surfynol® DF66 and BYK® 045 defoamers are very suitable for use in the self-leveling formulation to give optimum air release and surface properties. ZetaSpers® 1600 and Disperbyk® 190 can be used to effectively aid in wetting pigments and increasing flow and leveling properties to give a system which yields good surface and flow properties.

### **Fillers**

The filler package is optimized with the correct balance of sand grades to yield a system with good flow and leveling. Quartz sand and barytes (BaSO<sub>4</sub>) are recommended to be used in combination with dry pigments or pre-dispersed pigment pastes to give the desired performance and aesthetics.

## Starting Point Formulation – Waterborne self leveling floor

This formulation is ideally suited as a self leveling compound for concrete floors.

			By Wt.
<b><i>A-Component</i></b>			
1. Liquid Epoxy Resin	EEW=190	Various	8.1
2. Reactive Diluent	Epodil®748 diluent	Air Products	1.1
			<b>9.2</b>
<b><i>B-Component</i></b>			
3. Curing agent	Anquamine® 731 curative	Air Products	9.5
4. Defoamer	Byk® 045	BYK	0.80
5. Diluent	DI Water	Local	10.30
6. Pigment TiO <sub>2</sub>	Kronos® 2160 pigment	Kronos	4.00
7. Filler BaSO <sub>4</sub>	Cimbar™ 325 filler	Cimbar	13.00
8. Rheology Modifier	Rhodopol 23 xanthan gum (3% water)	Rhodia	0.4
			<b>38.00</b>
<b>B-Component Manufacture Procedure:</b>			
<ul style="list-style-type: none"> <li>• Charge components 3-4 and stir homogeneous at low shear</li> <li>• Slowly charge components 5-8 while increasing speed shear</li> <li>• Mix at medium shear for 15 minutes</li> </ul>			
<b><i>C-Component</i></b>			
9. Quartz Sand	US Silica Sil-co-sil® 106	US Silica	28.00
10. Quartz Powder	US Silica NJ #70	US Silica	34.00
			<b>62.0</b>
<b>Total</b>			<b>109.2</b>

### Description

This self leveling flooring system is prepared by mixing Component A with Component B for 2-3 minutes using low shear mechanical mixing to produce a homogeneous mixture. Component B may have some soft settlement that should be thoroughly mixed prior to adding Component A. Add component C and mix for 2-3 minutes using low shear mechanical mixing to produce a homogeneous mixture. Once mixed it can be applied to the concrete substrate using a squeegee or similar tool to spread the mixture and followed by spike rolling in order to promote de-aeration.

## Technical Data

Mixing ratio A:B:C	Weight	9.2 : 38 : 62	Flow <sup>2</sup>	Inches	8
Adhesion to Concrete	Psi	400 <sup>1</sup>	Gloss	60°	10-15
Shore D Hardness 1 Day 7 Day 1 Day 7 Day	@ 25 °C	70	Working Time	Minutes	30-45
	@ 25 °C	75	Binder Content (mix)	Wt. %	13.3
	@ 10 °C	60	Solids Content (mix)	Wt. %	86
	@ 10 °C	75			
Chemical Resistance 24 hour, spot test	3% Acetic Acid 10% NaOH Ethanol Xylene Water	No Effect No Effect No Effect No Effect No Effect	Stain Resistance 24 hour, spot test	Red Wine Tea Coffee Cola Mustard Ketchup	No Effect No Effect No Effect No Effect Slight stain Slight stain

<sup>1</sup> 100% failure in concrete

<sup>2</sup> 225 gram mixed mass in 3" ID pipe, flow on a Teflon sheet

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