

# CARDAMINE H 640

EPOXY CURING AGENT [PHENALKAMINE]

## General Description

**CARDAMINE H640** is one of a series of specially formulated phenalkamine curing agents developed for use with liquid and solid epoxy resins. [this grade is solvent free]

**CARDAMINE H640** is characterised by good reactivity and tolerant mix ratio, excellent hydrophobic character and subsequent corrosion resistance, good cure at low temperature and under adverse conditions with a high degree of flexibility and toughness.

## Applications

**CARDAMINE H640** may be utilised in a variety of applications including numerous high solids marine and heavy duty surface coatings, systems for potable water (tank and pipe lining), concrete primers and a variety of further primers and surface coatings.

## Key Properties

- Low viscosity [solvent free]
- Tolerant mix ratio and good compatibility with epoxy resins
- Good cure rate and cure at low temperature and adverse conditions
- Excellent water and corrosion resistance
- High flexibility and toughness

### Specification

**CARDAMINE H640** polymer specification and supplementary physical and handling properties. Table 1 provides details of some of the product characteristics. The values highlighted by the circular symbols [left hand column of table] are properties tested on a batch basis and reported in the certificate of analysis. All other properties are typical of batch manufacture and are for technical information only. They do not constitute a specification.

Table 1

| Physical Property                       | Units     | Method <sup>(1)</sup> | Minimum            | Maximum |
|---|-----------|-----------------------|--------------------|---------|
| • Appearance - [Red/Brown Liquid]       | -         | BSMT A 1001-001       | ETS <sup>(3)</sup> | -       |
| • Colour                                | Gardner   | BSMT A 1002-001       | -                  | 18      |
| • Viscosity                             | Poise     | BSMT A 1003-005       | 20                 | 40      |
| • Amine Value                           | Mg/KOH/gm | BSMT A 1019-001       | 475                | 550     |
| • Gel-time - [150 gm Weight 100:40 w/w] | Minutes   | BSMT A 1021-001       | 20                 | 50      |
| - Specific Gravity - [Weigh Cup]        | Kg/litre  | BSMT A 1010-002       | 0.95               | 1.05    |

**Mix Ratio – stoichiometry**

It is customary to formulate systems with numerous additives that may be employed to enhance processing or application properties. Irrespective of the additional materials used, the ratio of reactive components should be maintained in accordance with the stoichiometric levels suggested.

- **AHEW** [Active Hydrogen Equivalent Weight] 81
- **Mix ratio** [PHR – Parts Per Hundred of Epoxy resin with an EEW 190] – *by weight* 35 – 45

**CARDAMINE H640** has a tolerant mix ratio and formulations can be altered to enhance flexibility and cured property performance. **CARDAMINE H640** when formulated with higher addition levels will increase adhesion and flexibility but have an adverse effect on chemical resistance.

The mix ratio quoted is based on the usage of the epoxy curing agent in a stoichiometric ratio with an epoxy resin with an EEW of 190. In the event that the system is formulated with alternate epoxy resin and systems of differing EEW values the ratio should be calculated based on:

$$\left[ \frac{\text{AHEW of CARDAMINE grade}}{\text{EEW of epoxy resin}} \times 100 = \text{use ratio with 100 pts epoxy component} \right]$$

### Cure Schedules

Several cure schedules may be employed including ambient curing although if solvated systems are employed then the cure rates will be influenced by the chosen solvent system.

**CARDAMINE H640** will cure at low temperatures [0°C] and under adverse conditions. With ambient cure systems whilst the initial set time may be a matter of hours it may well take several days for the full development of properties. The rate of cure may be accelerated through both the application of heat and/or inclusion of accelerators. Further performance enhancement may be obtained with post-curing operations.

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| Suggested cure schedule options |                  |
|---------------------------------|------------------|
| # 1                             | 7 days @ ambient |

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### Chemical Resistance

Excellent resistance to water and salt water. Good resistance to aqueous acids and alkalis and reasonable solvent resistance but poor resistance to ketones and glycol ethers.

### Packaging

**CARDAMINE H640** is supplied in the following standard pack sizes. [alternate packaging may be available upon request]

210 lt drums – tight head @ 200 KG net weight

IBC units @ 1000 KG net weight

### Storage

**CARDAMINE H640** should be kept in the original containers and sealed. Containers should be stored in a cool, dry place in compliance with the appropriate legislative controls.

**CARDAMINE H640** will absorb moisture and carbon dioxide which may influence the physical properties and cure when reacted with epoxy resins.

### Shelf Life

If stored in accordance with the guidelines provided this grade has a minimum shelf life of **12 months**. If material is held beyond this period of time then it should be evaluated to confirm that it remains suitable.

### General

In the event that the system detailed herein does not satisfy any particular requirements, either in terms of the physical, mechanical or chemical resistance properties then we would be pleased to discuss alternative grades. In the event that further information is required, our technical sales staff will be pleased to establish if the information is available and offer assistance.

### Health and Safety

Prior to using material, information should be sought from our general guidance notes and specific safety data reviewed from the Safety Data Sheets (SDS). SDS information is periodically updated and revised copies will be forwarded as changes are made.

### Notice

All information is based upon results gained from experience and is believed to be accurate but is given without acceptance of liability for loss or damage attributable to reliance thereon as conditions of use lie outside our control. Users should always carry out tests to establish the suitability of any products for their intended application. No statements shall be incorporated in any contract unless expressly agreed in writing nor construed as recommending the use of any product in conflict of any patent. All goods are supplied subject to Bitrez LTD's General Conditions of Sale



innovative phenalkamine curing agents for epoxy resins

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