

## Technicure® MDU-11M

CAS # 10097-09-3

### Description:

Technicure® MDU-11M, [4,4'- (methylene bis (phenyl dimethyl)) urea, is a substituted urea. It is used as a dicyandiamide (DICY) accelerator in one-component epoxy resin based formulations. Typically the product is used with epoxy resin and dicyandiamide between 1-3 phr. The loading level of an accelerator will provide balance of low temperature reactivity and formulation shelf stability.

### Advantages:

- Excellent formulation shelf stability
- Moderate glass transition temperature
- Excellent adhesion to a variety of substrates

### Typical Applications:

- One-component paste and film adhesives for automotive and aerospace applications
- Composites such as pre-pregs
- Powder coatings

### Handling Precautions:

Refer to the product Safety Data Sheet

### Typical Properties:

|                   |                          |
|-------------------|--------------------------|
| Appearance:       | Off White powder         |
| Particle size:    | >80% less than 44 micron |
| Melting point:    | 220 - 230 °C             |
| Assay/Purity:     | 98% minimum              |
| Moisture content: | <0.7%                    |

Recommended use level with

Epoxy resin (EEW=190): 1-3 PHR with 3-8 PHR of DICY

### Typical Formulations (by wt.):

|                                    |     |     |
|------------------------------------|-----|-----|
| Liquid epoxy resin (EEW=190)       | 100 | 100 |
| Technicure® D-10 <sup>1</sup>      | 8   | 8   |
| Technicure® MDU-11M                | 1   | 3   |
| Fumed silica (H 200U) <sup>2</sup> | 1   | 1   |

### Reactivity by DSC<sup>3</sup>

|                        |     |     |
|------------------------|-----|-----|
| Onset Temp., °C        | 144 | 140 |
| Peak Temp., °C         | 154 | 147 |
| Heat of Reaction, J/gm | 259 | 258 |

### Glass Transition Temperature, °C

|  |                  |                  |
|--|------------------|------------------|
|  | 128 <sup>4</sup> | 143 <sup>4</sup> |
|  | 158 <sup>5</sup> | 155 <sup>5</sup> |

1. Dicy – Product of ACCI Specialty Materials
2. Fumed silica – Product of OCI Company Ltd.
3. 10°C/min. scan rate
4. By DMA, after 30 minutes cure at 140°C
5. By DMA, after 60 minutes cure at 140°C

### **A&C Catalysts, Inc.**

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## Supplemental Technical Information:

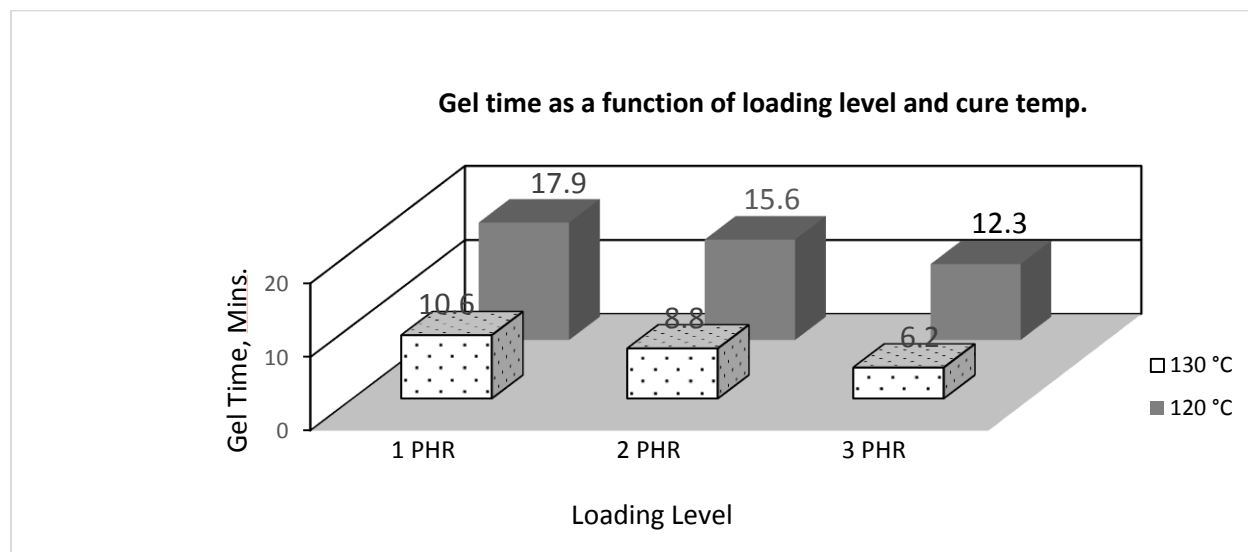
Three one-part formulations (Table 1) containing Technicure® MDU-11M were prepared to evaluate the effect of increasing level of the product on gel time at different temperatures.

Data in Table 1 shows that as the loading level of Technicure® MDU-11M increases the gel time decreases. The effect of loading level is more pronounced at higher temperature.

**Table 1. Formulations (by wt.) and gel time**

|                                 |      |      |      |
|---------------------------------|------|------|------|
| Liquid Epoxy resin (EEW=190)    | 100  | 100  | 100  |
| Technicure® D-10                | 8    | 8    | 8    |
| Technicure® MDU-11M             | 1    | 2    | 3    |
| Fumed silica (H 200U)           | 1    | 1    | 1    |
| Gel time <sup>1</sup> , minutes |      |      |      |
| @120°C                          | 17.9 | 15.6 | 12.3 |
| @130°C                          | 10.6 | 8.8  | 6.2  |

1. Sunshine gel timer



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