TECHNICAL BULLETIN

OMICURE® U-405 and OMICURE® U-405M

Urea Accelerator
Phenyl Dimethyl Urea
CAS No. 101-42-8

DESCRIPTION

OMICURE® U-405, an aromatic substituted urea, is intended for use as a latent accelerator for the dicyandiamide cure of epoxy resins. The addition of OMICURE U-405 to these formulations produces shelf-stable one-part products that cure in shorter times and/or at lower temperatures. OMICURE U-405M represents the micronized grade of OMICURE U-405.

Of the CVC Thermoset Specialties substituted ureas, OMICURE U-405 is most similar in structure to monuron and diuron. However, OMICURE U-405 does not contain any chlorine and is, therefore, safer to use than monuron or diuron. When substituting OMICURE U-405 for either of these products, the formulator should use approximately 30%-50% less 94 to achieve similar degrees of acceleration. Suggested use levels of OMICURE U-405 are ≤ 5 phr. At 100 °C, cures can be obtained in about one hour and in less than four minutes at temperatures ≥ 150 °C. Cure times are dependent on the composition of the formulated product and your particular end application.

Some of the factors that can effect shelf life are formulation ingredients and compounding parameters. Ingredients in which OMICURE U-405 is insoluble at processing and storage temperatures will enhance overall storage stability. OMICURE U-405 can be incorporated into your formulation concurrent with the dicy addition.

APPLICATIONS

As a latent accelerator in the dicyandiamide cure of epoxy resins used in:

- Adhesives
- Powder coatings
- Prepregs
- Encapsulation
- Reinforcements

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TYPICAL PROPERTIES

Appearance	**Clean powder**
Color	**off-white**
Odor	**Ammoniacal**
Melting Point, °C	**126 – 136**
Moisture Content, max %	**0.7**
Particle size, U-405, min % smaller than 44 microns	**80**
Particle size, U-405M (micronized), min % smaller than 44 microns	**95**

PERFORMANCE DATA

Shelf Life and Tg of OMICURE U-405 Accelerated DGEBA/Dicy

Fomulation, pbw	A	B	C	D	E	F
DGEBA*	100	———	———	———	———	——>
OMICURE DDA-10 (dicyandiamide)	8	———	———	———	———	——>
Hydrophobic fumed silica	3	———	———	———	———	——>
OMICURE U-405	0	1	3	5	-	-
Monuron	-	-	-	-	5	-
Diuron	-	-	-	-	-	5

Room Temperature Shelf Life	A	B	C	D	E	F
Time to double viscosity, weeks	> 70	20	10	9	16	24
Tg, °C**	140	130	118	110	115	115

**EEW:182-192, 25 °C; Viscosity: 11,000-14,000 cps*

***Determined on DSC second scan, first scan to 275 °C, 20 °C per minute*

PACKAGING & AVAILABILITY

OMICURE U-405 (unmicronized) and U-405M (micronized) come in plastic- lined corrugated cardboard boxes (net weight 40 lb). Check with your sales representative for specific designations and particle size specifications.

HEALTH & SAFETY PRECAUTIONS

OMICURE U-405 is a fine powder classified as a nuisance dust. It is not a primary skin or eye irritant but will cause respiratory irritation with prolonged dust inhalation.

The use of engineering controls to keep the material confined or convey dust away from the breathing zone is the preferred method of handling. Alternatively, an approved dust respirator and impervious clothing should be worn if the material becomes airborne.

Allowing the dust to settle on vegetation may cause harm and may prevent germination.

Refer to CVC Thermoset Specialties Material Safety Data Sheet on OMICURE U-405 for additional safety and health information. The MSDS is revised as new data becomes available.

DISCLAIMER

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