All About Resins

TECHNICAL DATA SHEET

Crosslinkers

CYMEL® U-80 resin

PRODUCT DESCRIPTION

CYMEL U-80 resin is a highly n-butylated urea resin supplied at >96% solids content. Its high extent of alkylation and hydrophobic nature make the CYMEL U-80 resin suitable for a wide range of coating applications including high solids primers for automotive, general industrial, and container coatings providing improved film flexibility and adhesion and to various substrates CYMEL U-80 resin is insoluble in water but can be used in emulsified form as a crosslinking agent in water dispersible alkyds, acrylic resins and in emulsion systems. Because of the limited UV resistance properties of urea resins, CYMEL U-80 resin is not suitable for exterior applications.

BENEFITS

- Low temperature cure
- Broad compatibility
- Water resistance
- Excellent film flexibility
- Excellent adhesion to metal substrates

APPLICATION AREAS

- High solids primer formulations
- Interior can coating formulations
- Low bake conversion varnishes and enamels

PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	Visual
Non-volatile by wt.	≥ 96%	Foil, 45 min/45°C
Viscosity, 25°C	2000-3400 mPa-s	Dynamic Viscosity
Free formaldehyde	≤ 0.3%	Sulfite Method
Color, Gardner	< 1	

SOLUBILITY

Alcohols	Complete
Esters	Complete
Ketones	Complete
Aromatic hydrocarbons	Complete
Aliphatic hydrocarbons	Complete
Water	Insoluble

COMPATIBILITY

Acrylic resins	Very good
Alkyd resins	Very good
Polyester resins	Good
Epoxy resins	Very good

BACKBONE POLYMER SELECTION

CYMEL U-80 resin contains mainly butoxymethyl functional sites making it a very effective crosslinker for backbone polymer resins containing hydroxyl, carboxyl, and amide functional groups, such as those found on alkyd, polyester and acrylic based resins. CYMEL U-80 resin is hydrophobic in nature and compatible with a wide range of backbone polymers providing films with very good appearance, adhesion and film flexibility properties. The optimum level of CYMEL U-80 resin in a given formulation should be determined experimentally. Depending on the application, 20 to 40%, based on resin solids can be taken as a starting point.

CATALYSIS

CYMEL U-80 resin will respond best to sulfonic acid catalysts, like CYCAT® 4040 or the blocked version, CYCAT 4045 catalyst. Generally, 0.5 - 1.0% catalyst solution on total binder solids of the formulation is sufficient to provide good cure for industrial formulations at baking schedules of 20 minutes at 120°C to 160°C. For low temperature cure systems, 20 minutes at 100 to 120°C, 2-3% of CYCAT 4040 catalyst is advised to be used.

FORMULATION STABILITY

The stability of formulated systems containing CYMEL U-80 resin can be enhanced by the addition of alcohols, amines or a combination of these. Low molecular weight primary alcohols such as methanol and n-butanol are most effective. Recommended amines are TEA, DMEA or 2-AMP at a concentration of 0.5-1.0% on total binder solids. Package stability can also be enhanced by the use of a blocked acid catalyst such as CYCAT 4045 catalyst. For waterborne systems a pH between 7.5-8.5 should be maintained to achieve stability.

STORAGE STABILITY

CYMEL U-80 resin has a shelf life of 4 years from date of manufacture when stored at temperatures between 5°C and 30°C. Although low temperatures are not detrimental to stability, the viscosity of the product will increase making the resin more difficult to pump or pour. Product viscosity can be returned to normal by gentle re-warming, however, care should be taken to avoid excessive localized heating as this can cause an irreversible increase in viscosity.

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