All About Resins

TECHNICAL DATA SHEET

Crosslinkers

CYMEL® 3020 resin

PRODUCT DESCRIPTION

CYMEL 3020 resin is a highly alkylated, mixed ether (methyl/n-butyl) melamine crosslinker. Its hydrophobic nature combined with very good film appearance properties makes CYMEL 3020 resin suitable for automotive topcoat applications. CYMEL 3020 is insoluble in water but has excellent compatibility with water soluble backbone polymers and provides very good stability in pH-buffered alkaline waterborne formulations.

BENEFITS

- Electrodeposition properties
- Film appearance properties
- Adhesion and intercoat adhesion

APPLICATION AREAS

- Anodic electrodeposition
- Automotive topcoat formulations
- High solids coatings

PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	Visual
Non-volatile by wt.	≥ 97%	Foil, 45 min/45°C
Viscosity, 23°C	900 – 1800 mPa-s	Dynamic Viscosity
Free formaldehyde	0.1%	Sulfite Method
Color, APHA	< 30	ISO 6271
Density, 23°C	1.04 g/cm^3	

SOLUBILITY

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

COMPATIBILITY

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

BACKBONE POLYMER SELECTION

CYMEL 3020 resin contains mainly methoxymethyl and butoxymethyl functionalities making it a very effective crosslinker for backbone polymer resins containing hydroxyl, amide or carboxyl functional groups, such as found on alkyd, polyester or acrylic resins. Cymel 3020 resin is hydrophobic in nature and compatible with a wide range of backbone polymers providing films with very good appearance, adhesion and resistance properties. Although the optimum level of CYMEL 3020 resin in a given formulation should be determined experimentally, its effective equivalent weight is in the range of 160-220.

CATALYSIS

CYMEL 3020 resin will respond best to sulfonic acid catalysts, like CYCAT® 4040 catalyst or the blocked version CYCAT 4045 catalyst. Generally, 0.5 to 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 electro deposition formulations, a cure schedule of 20 minutes at 150°C and higher is advised. Higher concentrations of catalyst might be necessary if there are basic pigments or additives present in the formulation.

FORMULATION STABILITY

The stability of formulated systems containing CYMEL 3020 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 of 7.5-8.5 should be maintained to achieve stability.

STORAGE STABILITY

CYMEL 3020 resin has a shelf life of 4 years the date of manufacture when stored at temperatures between 5°C and 30°C. Although lower temperatures are not detrimental to stability, its viscosity will increase, possibly making the resin difficult to pump or pour. The viscosity will reduce again on warming, but care should be taken to avoid excessive local heat, as this can cause an irreversible increase in viscosity.

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