CYMEL® UM-15 resin

PRODUCT DESCRIPTION

CYMEL UM-15 resin is a highly methylated urea crosslinker supplied as a liquid at >96% solids. Its high solids combined with very fast cure makes CYMEL UM-15 resin suitable in high solids, low temperature curing systems, like wood and paper coatings. CYMEL UM-15 is hydrophilic in nature, completely water soluble, and has very good compatibility with water soluble anionic backbone polymers. This makes CYMEL UM-15 resin suitable for waterborne applications, like paper and wood coatings, where speed of cure is very important.

BENEFITS

- High solids
- Very fast cure
- Water solubility

APPLICATION AREAS

- Wood coating formulations
- Foil and paper coating formulations
- Textile coatings

PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	Visual
Non-volatile by wt.	98 ± 2%	Foil, 45 min/45°C
Viscosity, 23°C	6800 – 17000 mPa-s	Dynamic Viscosity
Free formaldehyde	~0.5%	Sulfite Method
Color, APHA	< 70	ISO 6271

SOLUBILITY

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

COMPATIBILITY

Acrylic resins	Good
Alkyd resins	Very good
Polyester resins	Good
Nitrocellulose	Very good
Cellulose acetate butyrate	Very good
Polyvinyl butyral	Very good

BACKBONE POLYMER SELECTION

CYMEL UM-15 resin contains mainly methoxymethyl functionalities making it a very effective crosslinker for backbone polymer resins containing hydroxyl or amide functional groups, such as found on alkyd, polyester, acrylic and cellulose based resins. The optimum level of CYMEL UM-15 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 UM-15 resin will respond best to sulfonic acid catalysts, like CYCAT® 4040 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 15 minutes at 120°C or 5 min at 150°C. For wood, foil and paper coatings higher amounts of catalyst are required and the catalyst added before use as a 2K formulation.

FORMULATION STABILITY

The stability of solvent-borne systems containing CYMEL UM-15 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. 2K formulations with higher amounts of catalyst that are cured under ambient or low bake conditions can only be stabilized with alcohols. For waterborne systems, a pH of 7.5-8.5 should be maintained for adequate stability.

STORAGE STABILITY

CYMEL UM-15 resin has a shelf life of 4 years from 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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