

## PRODUCT DESCRIPTION

CYMEL® 1170 resin is a highly butylated glycoluril crosslinker designed for use in both water and organo-soluble coating systems. Its superior adhesion relative to existing melamine and benzoguanamine crosslinkers provides increased corrosion resistance and flexibility. The better adhesion is not lost after post-forming of parts and exposure of the stressed coating to humidity, steam, dry heat, or weather. This feature makes CYMEL® 1170 resin a good candidate for coil of metal decoration enamels and primers. In addition, CYMEL® 1170 resin releases significantly lower amounts of formaldehyde during the baking process compared to other amino resins.

## BENEFITS

- High solids content
- Excellent adhesion and intercoat adhesion
- Excellent corrosion and overbake resistance

## APPLICATION AREAS

- High solids coatings
- Coil coating enamels
- Automotive primers
- Appliance primers

## PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	ASTM E284
Non-volatile by wt.	96-100%	DIN 55671 (Foil, 45 min/45°C)
Viscosity, 25°C	Z – Z2	ASTM D1545 (Gardner-Holdt)
Free formaldehyde	< 0.35%	BS-EN-1243-2011
Color, Gardner	< 3	DIN EN ISO 4630-1

## SOLUBILITY

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

## COMPATIBILITY

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

## BACKBONE POLYMER SELECTION

CYMEL® 1170 resin contains mainly butoxymethyl functional sites making it a very effective crosslinker for backbone polymer resins containing hydroxyl, amide or carboxyl functional groups, such as those found on alkyd, polyester and acrylic resins. CYMEL® 1170 resin is very good compatible with a wide range of backbone polymers and provide films with excellent flexibility, adhesion and humidity resistance properties. The effective equivalent weight of CYMEL® 1170 resin typically ranges from 150 - 230, however, its optimum loading should be determined experimentally for each formulation with consideration of the performance properties to be optimized.

## CATALYSIS

CYMEL® 1170 resin reacts according to the specific acid catalysis mechanism, consequently will respond best to strong acid catalysts (pKa value of <1) 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 at baking schedules of 20 minutes at 125°C to 180°C. The presence of weakly basic reacting compounds, such as melamine or urea resins or basic pigments can reduce the cure response of this glycoluril resin and higher concentrations of catalyst might be necessary to maintain good reactivity.

## FORMULATION STABILITY

The stability of formulated systems containing CYMEL® 1170 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.

## STORAGE STABILITY

CYMEL® 1170 resin has a shelf life of 1440 days from the date of manufacture when stored at temperatures below 32°C. Although low 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.