

## PRODUCT DESCRIPTION

CYMEL® 659 resin is a partially n-butylated benzoguanamine resin supplied in n-butanol. Like other benzoguanamine resins, CYMEL® 659 resin imparts excellent adhesion and chemical resistance to the coating, but without the need for an external catalyst in the formulation. Because of the limited light resistance properties of benzoguanamine resins, CYMEL® 659 is not suitable for exterior applications.

## BENEFITS

- Corrosion resistance
- Chemical resistance
- Adhesion properties

## APPLICATION AREAS

- Automotive primers
- Can and container coatings
- Coil coating primers

## PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	ASTM E284
Non-volatile by wt.	70-74%	DIN EN ISO 3251 (Pan, 2 hr/120°C)
Viscosity, 25°C	575-1075 mPa·s	DIN EN ISO 3219
Free formaldehyde	< 1.0%	Sulfite Titration
Color, APHA	≤ 15	DIN EN ISO 6271

## SOLUBILITY

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

## COMPATIBILITY

Acrylic resins	Good
Alkyd resins	Good
Polyester resins	Good
Epoxy resins	Good

## BACKBONE POLYMER SELECTION

CYMEL® 659 resin contains a combination of butoxymethyl, methylol and imino functionalities, making it a very effective crosslinker for backbone polymer resins containing hydroxyl, carboxyl, or amide functional groups, such as those found on alkyd, polyester or acrylic resins. In addition to crosslinking, CYMEL® 659 resin will self-condense readily resulting in films with excellent film hardness. Although the optimum level of CYMEL® 659 resin should be determined experimentally, loadings of 25 to 35% based on resin solids are typically most effective.

## CATALYSIS

CYMEL® 659 resin may not require the addition of an acid catalyst to the formulation to obtain effective cure. In many instances, the acidity of the backbone polymer in the formulation is sufficient to catalyze the reaction under normal baking conditions (15 - 20 minutes at 120 - 150°C). If catalyst addition is required, then 0.5 - 1.0% of CYCAT® 296-9 catalyst based on total resin solids is recommended.

## FORMULATION STABILITY

The stability of solvent-borne systems containing CYMEL® 659 resin can be enhanced by the addition of primary alcohols, tertiary amines, or a combination of these. Low molecular weight primary alcohols such as ethanol and n-butanol are most effective. Recommended amines are TEA or DMEA at a concentration of 0.5 - 1.0% on total binder solids.

## STORAGE STABILITY

CYMEL® 659 resin has a shelf life of 1080 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.