

# CYMEL<sup>®</sup> U-21-510 resin

## PRODUCT DESCRIPTION

CYMEL U-21-510 resin is a partially n-butylated urea resin supplied in a mixture of n-butanol and xylene. It has excellent compatibility with epoxy resins. It is recommended in primer formulations which are to be topcoated and re-baked. Low viscosity and epoxy solution compatibility make this product an ideal modifier.

## APPLICATION AREAS

- Coil Coatings
- Metal Deco Coatings
- Can Coatings

## PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	Visual
Non-volatile by wt.	58-62%	Pan, 90 min/105°C
Viscosity, 25°C	R-U	Gardner-Holdt
Free formaldehyde	≤ 1.0%	Sulfite Method
Color, Gardner	< 1	

## SOLUBILITY

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

## BACKBONE POLYMER SELECTION

CYMEL U-21-510 resin not only reacts with the hydroxyl and carboxyl functionalities of the other binders in the formulation, but it also has a tendency for self-condensation. Therefore, its practical equivalent weight, on a solids basis, is typically 200-280. The resulting films are harder and more resistant to chemical attack with increasing levels of CYMEL U-21-510 resin, but they may also be more brittle. The optimum level of the resin in a given formulation should be determined experimentally.

## CATALYSIS

CYMEL U-21-510 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<sup>®</sup> 4040 catalyst or CYCAT 296-9 catalyst based on total resin solids is recommended.

## FORMULATION STABILITY

The stability of baking enamels containing CYMEL U-21-510 resin can be enhanced by the addition of alcohols, amines or combination of these. Low molecular weight primary alcohols, such as 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.

## STORAGE STABILITY

CYMEL U-21-510 resin has a shelf life of 12 months 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.