

## PRODUCT DESCRIPTION

CYMEL® 1141 resin is a highly methylated/iso-butylated, carboxy-modified melamine crosslinker supplied in iso-butanol. CYMEL® 1141 resin is especially designed for electro-deposition primer formulations requiring excellent corrosion and resistance properties. CYMEL® 1141 contains chelating groups which can form colored compounds with heavy metal ions such as iron and zinc. For that reason it is recommended to use CYMEL® 1141 resin only in dark single coat applications or primers and not in pastel colors.

## BENEFITS

- Electrodeposition properties
- Adhesion properties
- Corrosion resistance

## APPLICATION AREAS

- Anodic electrodeposition
- Cathodic electrodeposition
- High solids primer formulations

## PHYSICAL PROPERTIES

Property	Range	Method
Appearance	Clear Liquid	ASTM E284
Non-volatile by wt.	83-87%	DIN 55671 (Foil, 45 min/45°C)
Viscosity, 25°C	W-Y	ASTM D1545 (Gardner-Holdt)
Free formaldehyde	<0.4%	Sulfite Titration
Color, Gardner	≤ 3	DIN EN ISO 4630-1

## SOLUBILITY

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

## COMPATIBILITY

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

## BACKBONE POLYMER SELECTION

CYMEL® 1141 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® 1141 is compatible with a wide range of backbone polymers providing films with superior adhesion and resistance properties. The effective equivalent weight of CYMEL® 1141 typically ranges from 150 - 250 g/eq, however, its optimum loading should be determined experimentally for each formulation with consideration of the performance properties to be optimized.

## CATALYSIS

CYMEL® 1141 resin will respond best to sulfonic acid catalysts, like CYCAT® 4040 catalyst or the amine-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 at baking schedules of 20 minutes at 120°C to 160°C. Higher concentrations might be necessary if there are basic pigments or additives present in the formulation. Waterborne systems generally require temperatures of 150°C and higher to effect cure.

## FORMULATION STABILITY

The stability of solvent-borne systems containing CYMEL® 1141 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 dimethylethanolamine (DMEA), triethylamine (TEA), or 2-amino-2-methyl-1-propanol (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 for adequate stability.

## USE IN CATIONIC ELECTRODEPOSITION

CYMEL® 1141 resin may be used as a crosslinking agent for cationic resins with pKa value greater than 5.5. CYMEL® 1141 should be added to the cationic resin before dilution with water. This blend has been found to be stable at a pH as low as 3.0. A cure temperature of 350 - 400°F is required to achieve resistance properties with cationic polymers.

## STORAGE STABILITY

CYMEL® 1141 resin has a shelf life of 1080 days from the date of manufacture when stored at temperatures below 32°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.