

CYCAT[®] 4045 catalyst

BENEFITS

- Fast cure response
- Excellent stability in waterborne and solventborne systems
- Minimizes film wrinkling

PRODUCT DESCRIPTION

CYCAT 4045 catalyst is an amine blocked para-toluene sulfonic acid catalyst. It is recommended for accelerating the cure response of amino crosslinking resins while providing improved formulation package stability compared with the un-blocked para-toluene sulfonic acid CYCAT 4040 catalyst. It is especially recommended for use with highly alkylated amino crosslinking resins. It provides excellent stability in high solids and waterborne systems, and in the latter it can be added without causing binder precipitation, which can often occur due to a drop in pH.

As a general rule systems which employ a blocked catalyst such as CYCAT 4045 catalyst will have a decreased rate of cure compared to those employing an unblocked catalyst. CYCAT 4045 catalyst has been formulated to minimize to this adverse effect on cure response while offering improved package stability.

PRODUCT FORM

Supplied as a solution, at 35% non-volatile content in ethylene glycol.

TYPICAL PRODUCT CHARACTERISTICS

Appearance	Clear liquid
Non-volatile by wt. (Pan, 60 min/100°C)	35%
Active acid by wt.	20%
Color, Gardner	1
Acid number, solution	60-70
Weight per gallon	9.6 lb
Specific Gravity, 25°C	~ 1.16

SOLUBILITY

CYCAT 4045 catalyst is soluble in oxygenated solvents such as alcohols, glycols, glycol ethers and water. It has limited solubility in ketones, esters and hydrocarbon solvents.

CATALYST ADDITION

In order to prevent recrystallization of the acid, a sufficiently high level of alcohol should be present in the total solvent system of the formulation. Recrystallized acid can cause a reduction in cure response and may create local areas of high acidity that could cause the formation of gel structures. Therefore, it is suggested that CYCAT 4045 catalyst be diluted approximately 1:1 with an alcohol before adding to the final formulation.

RECOMMENDED LEVELS

CYCAT 4045 catalyst contains 20% active acid and has an equivalent acid number of 60-70. Therefore, it is 50% less active than the un-blocked CYCAT 4040 catalyst. Therefore, in comparison with CYCAT 4040 catalyst it is recommended that twice the level of CYCAT 4045 be used to provide approximately the same cure response.

In systems containing highly alkylated amino crosslinking resins such as CYMEL[®] 303 LF resin in combination with hydroxyl or carboxy functional acrylic or polyester resins, the following starting point levels of CYCAT 4045 catalysts are recommended:

Polymer type	Cure Temp °C	Catalyst Level ⁽¹⁾
R-OH	>150	1.0
	125-150	2.0
	110-125	4.0
R-COOH	150-175	1.0
	125-150	2.0

(1) % catalyst solution based on total resin solids

TYPICAL COATING CHARACTERISTICS

System: White high solids acrylic enamel, 73% NV by wt, Pigment/Binder=80/100
Binder: Acryloid AT-400⁽²⁾ acrylic resin/CYMEL 303 resin = 80/20 (solids wt ratio)
Catalyst: Equivalent to 1% CYCAT 4040 catalyst on TRS
Cure: 20 minutes at 125°C

	CYCAT 4045	CYCAT 4040
DFT, mils	0.9	1.0
Gloss, 60°/20°C	97/82	100/73
Knoop Hardness	15.6	14.8
Pencil Hardness	2H-3H	2H-3H
Salt spray (ASTM B-117):		
Initial ⁽³⁾	-/82/-	-/73/-
144 hours ⁽³⁾	0.5/81/10	0.75/77/8F
384 hours ⁽³⁾	1.0/81/6F	0.75/76/6F
504 hours ⁽³⁾	1.5/80/5F	1.5/75/6F
Humidity Resistance (Cleveland, 60°):		
Initial ⁽⁴⁾	82/10	73/10
72 hours ⁽⁴⁾	83/9D	74/10
168 hours ⁽⁴⁾	75/9D	66/9MD
240 hours ⁽⁴⁾	70/9D	60/9D

(2) Product of Rohm & Haas

(3) Rust/Gloss/Blister

(4) Gloss/Blister

CYTEC

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SAFETY AND HANDLING

Consult the Material Safety Data Sheet (MSDS) available from Cytec.

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