

# CATALYSTS FOR INDUSTRIAL COATINGS

CYCAT® Catalysts



# Catalysts for Industrial Coatings

## About allnex

allnex is a global specialty chemicals company and leading supplier of resins and additives for architectural, industrial, protective, automotive and special purpose coatings and inks. We are recognized as a specialty chemicals pioneer offering the broadest portfolio of high quality products.

Our product range entails innovative liquid resins and additives, radiation cured and powder coating resins and additives and crosslinkers for use on wood, metal, plastic and other surfaces.

Supported by 33 manufacturing and 23 research and technology support facilities throughout the world, we provide responsive and local support to our customers, helping them to rapidly bring advanced coating solutions to the market.

## CYCAT® Catalysts

allnex supplies acid catalysts for accelerating the cure response of amino crosslinking agents. Each catalyst is designed to fulfill a specific applications requirement, and in most cases, one catalyst will be preferable over another depending on formula composition and curing conditions.

## Catalyst Selection Criteria

The reaction of amino resins and polyols is complex and often requires acidic catalysts. The relative efficiency of catalysts correlates to the acidity, and the overall reaction rate is directly proportional to the concentration of the catalyst. Frequently used catalysts are p-toluenesulfonic acid (PTSA), dodecyl benzene sulfonic acid (DDBSA), dinonyl naphthalene disulfonic acid (DNNDSA) and organic phosphoric acid.

Ionic or covalently blocked sulfonic acid catalysts are used in amino resin-based stoving systems. The deactivation of the sulfonic acid is a very important tool to achieve the desired balance of storage stability of a catalyzed system followed by rapid cure when the coating reaches the desired temperature.

## Acid Types

Strong acids are most effective for highly alkylated melamine, benzoguanamine and all urea-formaldehyde resins.

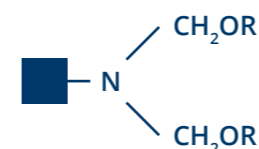
Weak acids are most effective for both the crosslinking and self-condensation reactions of resins which are subject to general acid catalysis. Thus, high NH containing resins and partially alkylated melamine-

formaldehyde resins and all conventional butylated resins benefit most by the use of weak acids as catalysts. In these systems, weak acids are actually much more efficient catalysts than are strong acids.

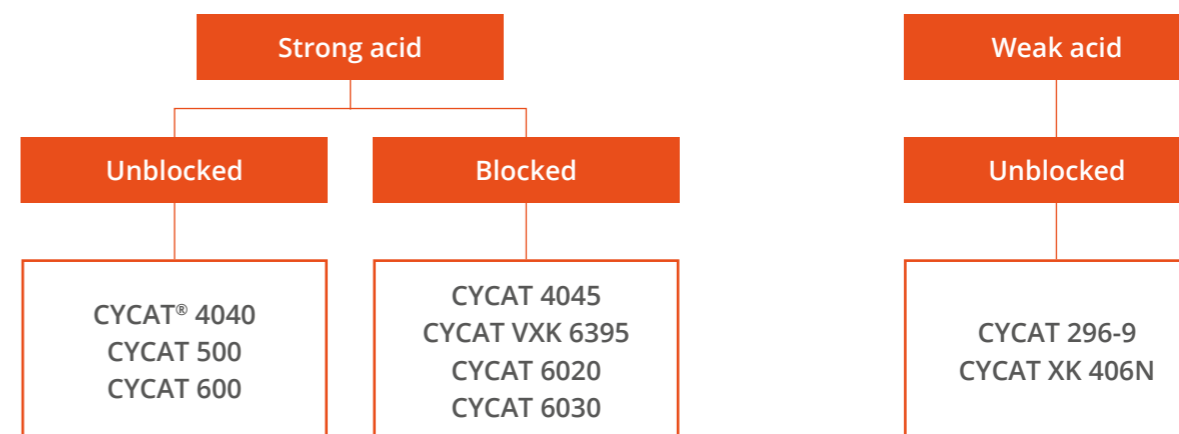
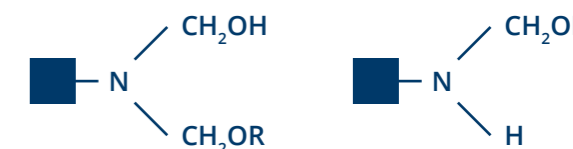
Weak acids include mono and alkyl phosphates, phosphoric acid, carboxylic acids, and pyrophosphates such as CYCAT 296-9 catalyst. CYCAT XK 406N catalyst is especially designed for phenolic resins.

## Catalyst Selection

### Highly alkylated



### Partially alkylated & High Imino



Product Name	Characteristics & Properties					Solubility					Water	% Total Resin Solids	Coating Type	Usage & Comments	
	Type	Acid	% Active	Acid Value as is	Min. Cure Temp °C (°F)	Alcohols	Glycol Ethers	Aromatic Hydrocarbons	Aliphatic Hydrocarbons	Ketones / Esters					
<b>Weak Acid</b>															
CYCAT XK406 N	Organic phosphoric acid	Polyphosphoric acid	16	90-110	○	●	●	●	○	●	○	2.0 – 4.0%	Solvent, Water	Catalyst for phenolic resins.	
CYCAT 296-9	Phosphoric acid	Dimethyl acid pyrophosphate	9	360-385	○	●	●	●	○	●	●	0.5 – 5.0%	Solvent, Water	To accelerate the cure reactions of high imino and partially alkylated resins.	
<b>Strong Acid</b>															
CYCAT 500	Sulfonic acid	Dinonyl naphthalene disulfonic acid	40	80-90	○	●	●	○	●	●	○	0.5 – 3.5%	Solvent, Water	Especially recommended for electrocoating and electrostatic spray systems with improved water resistance.	
CYCAT 600	Sulfonic acid	Dodecylbenzene sulfonic acid	72	125-135	○	●	●	●	●	●	●	0.5 – 4.0%	Solvent, Water	Especially recommended for high solids formulations with hydrocarbon solubility, such as automotive clear coat and packaging coatings.	
CYCAT 4040	Sulfonic acid	p-Toluenesulfonic acid	40	130-140	○	●	●	○	○	●	●	0.5 – 4.0%	Solvent, Water	Strong acid catalyst for highly alkylated melamine, benzoguanamine, glycoluril and urea resins.	
<b>Blocked</b>															
CYCAT VXK 6395	Amine blocked sulfonic acid	p-Toluenesulfonic acid	25	80-90	80 (175)	●	●	●	○	●	●	1.0 – 5.0%	Solvent, Water	For 1K systems formulated with highly alkylated melamine, benzoguanamine, glycoluril and urea resins.	
CYCAT 4045	Amine blocked sulfonic acid	p-Toluenesulfonic acid	20	60-70	90 (195)	●	●	○	○	●	●	1.0 – 5.0%	Solvent, Water	For 1K systems formulated with highly alkylated melamine, benzoguanamine, glycoluril and urea resins.	
CYCAT 6020	Amine blocked sulfonic acid	Dodecylbenzene sulfonic acid	40	69-79	90 (195)	●	●	○	○	●	●	0.3 – 1.25%	Solvent, Water	For 1K systems formulated with highly alkylated melamine, benzoguanamine, glycoluril and urea resins.	
CYCAT 6030	Amine blocked sulfonic acid	Dodecylbenzene sulfonic acid	30	54-62	80 (175)	●	●	○	○	●	●	0.4 – 2.0%	Solvent, Water	For 1K systems formulated with highly alkylated melamine, benzoguanamine, glycoluril and urea resins.	



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