CATALYSTS FOR INDUSTRIAL COATINGS

CYCAT® Catalysts

www.allnex.com
**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 polyls 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 (DBDSA), dinonyl naphthalene disulfonic acid (DINNSDA) 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 strong acids.

**Catalyst Selection**

**Highly alkylated**

- CYCAT® 4040
- CYCAT 500
- CYCAT 600
- CYCAT VXK 6395
- CYCAT 4045
- CYCAT VXK 6390
- CYCAT 6020
- CYCAT 6030
- CYCAT 296-9
- CYCAT XK 406N

**Partially alkylated & High Imino**

- Strong acid
- Blocked Unblocked
- CYCAT® 4040
- CYCAT 500
- CYCAT 600
- CYCAT VXK 6395
- CYCAT 6020
- CYCAT 6030
- CYCAT 296-9
- CYCAT XK 406N

**Weak acid**

- CYCAT® 4040
- CYCAT 500
- CYCAT 600
- CYCAT VXK 6395
- CYCAT 4045
- CYCAT VXK 6390
- CYCAT 6020
- CYCAT 6030
- CYCAT 296-9
- CYCAT XK 406N

**Characteristics & Properties**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Type</th>
<th>Acid</th>
<th>% Active</th>
<th>Acid Value as %</th>
<th>Min. Cure Temp. °C</th>
<th>Alcohols</th>
<th>Aromatic</th>
<th>Hydrocarbons</th>
<th>Water</th>
<th>% Total Solids</th>
<th>Coating Type</th>
<th>Usage &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak Acid</td>
<td>CYCAT XK406 N</td>
<td>Organic phosphoric acid</td>
<td>Polyphosphoric acid</td>
<td>16</td>
<td>90-110</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>2.0 - 4.0% Solvent, Water</td>
</tr>
<tr>
<td></td>
<td>CYCAT 296-9</td>
<td>Phosphoric acid</td>
<td>Dimethyl acid pyrophosphate</td>
<td>9</td>
<td>360-385</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>0.5 - 5.0% Solvent, Water</td>
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<tr>
<td>Strong Acid</td>
<td>CYCAT 500</td>
<td>Sulfonic acid</td>
<td>Dinonyl naphthalene disulfonic acid</td>
<td>40</td>
<td>80-90</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>0.5 - 3.5% Solvent, Water</td>
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<tr>
<td></td>
<td>CYCAT 600</td>
<td>Sulfonic acid</td>
<td>Dodecyl benzene sulfonic acid</td>
<td>72</td>
<td>125-135</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>0.5 - 4.0% Solvent, Water</td>
</tr>
<tr>
<td></td>
<td>CYCAT 4040</td>
<td>Sulfonic acid</td>
<td>p-Toluenesulfonic acid</td>
<td>40</td>
<td>130-140</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>0.5 - 4.0% Solvent, Water</td>
</tr>
<tr>
<td>Blocked</td>
<td>CYCAT VXK 6395</td>
<td>Amino blocked sulfonic acid</td>
<td>p-Toluenesulfonic acid</td>
<td>25</td>
<td>80-90</td>
<td>80 (175)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>1.0 - 5.0% Solvent, Water</td>
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<tr>
<td></td>
<td>CYCAT 4045</td>
<td>Amino blocked sulfonic acid</td>
<td>p-Toluenesulfonic acid</td>
<td>20</td>
<td>60-70</td>
<td>90 (195)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>1.0 - 5.0% Solvent, Water</td>
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<tr>
<td></td>
<td>CYCAT 6020</td>
<td>Amino blocked sulfonic acid</td>
<td>Dodecyl benzene sulfonic acid</td>
<td>40</td>
<td>69-79</td>
<td>90 (195)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>0.3 - 1.25% Solvent, Water</td>
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<td>CYCAT 6030</td>
<td>Amino blocked sulfonic acid</td>
<td>Dodecyl benzene sulfonic acid</td>
<td>30</td>
<td>54-62</td>
<td>80 (175)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>0.4 - 2.0% Solvent, Water</td>
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</tbody>
</table>
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