K-PURE®
Specialty Additives
For Electronic Applications
**K-PURE TAG and CXC** blocked acids are particularly effective for accelerating and lowering the activation temperature of stable, one component systems based on; aminoplast, glycoluril, siloxane, silanol and phenoxy condensation reactions as well as epoxy homopolymerization and co-polymerization with polyols, vinyl ethers, oxetane and anhydride resins. Blocking techniques and features are described below.

### Amine Blocked Acids
- Solubility in water and polar solvents
- Broad activation temperature range
- Volatile by-product

\[
\begin{align*}
\text{O} & \text{SR} \\
\text{O} & \text{O} \\
\text{R}_1 & \text{N} \\
\text{R}_2 & \text{R}_3
\end{align*}
\]

### Covalently Blocked Acids
- No volatile by-products
- Narrower solubility range (hydrophobic)
- Solvent based

\[
\begin{align*}
\text{O} & \text{SR} \\
\text{O} & \text{O} \\
\text{R}_1 & \text{+} \\
\text{H} & \\
\text{N} & \\
\text{R}_2 & \text{ArH}
\end{align*}
\]

### Metal Blocked Acids
- Mono and divalent metals
- Surface active compounds
- Hydrophobic and hydrophilic
- Corrosion inhibition with catalytic behavior

\[
\begin{align*}
\text{O} & \text{SR} \\
\text{O} & \text{O} \\
\text{Me}^+ & \text{or} \text{Me}^{2+}
\end{align*}
\]

### Quaternary Blocked Acids
- Broad control over activation range
- 100% solids - white powders
- Narrower solubility range (hydrophobic)
- No volatile component

\[
\begin{align*}
\text{R}_1 & \text{R}_2 \\
\text{R}_3 & \text{ArH}
\end{align*}
\]

### K-PURE CDR - Resin Modifiers

**K-PURE resin modifiers** offer formulators three core chemistries that can be used to improve mechanical properties, crosslinking density and resistance properties.

**Core chemistries** include unique ester diols with low molecular weight and very narrow molecular weight distribution, urethane diols with an aliphatic urethane backbone and an acetoacetate functional reactive diluent.

#### Ester Diols
- Improve Flexibility
- Reduce Modulus

#### Urethane Diols
- Improve Chemical Resistance
- Improve Adhesion

#### Acetoacetates (AA)
- Improve Adhesion
- Improve Corrosion Resistance

### K-PURE CDI - Corrosion Inhibitors

K-PURE corrosion inhibitors represents a broad range of core chemistries for the protection of ferrous and non-ferrous metals. Most common applications and system dependency are found below.

#### Sulfonic Acids
- Potting Compounds
- Cleaners & Strippers

#### Phosphate
- Cleaners & Strippers
- Adhesives
- Potting Compounds

#### Amino Acid Derivatives
- Cleaners & Strippers
- CMP Slurries
- Adhesives
- Potting Compounds

#### Triazole Derivatives
- Cleaners & Strippers
- CMP Slurries
- Wire
- Adhesives
- Potting

#### Acetoacetate
- Adhesives
- Potting Compounds

#### K-PURE CDR Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Amino</th>
<th>Isocyanate</th>
<th>Silanol</th>
<th>Solvent</th>
<th>Solventless</th>
<th>Water</th>
<th>Epoxy</th>
<th>Epoxy</th>
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<tbody>
<tr>
<td>Ester Diols</td>
<td>✔️</td>
<td>✔️</td>
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<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Urethane Diols</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Acetoacetates (AA)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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</table>

*K-PURE CDI types: *Anionic **Cationic*
<table>
<thead>
<tr>
<th>Block Type</th>
<th>Min. Activation Range, °C</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAG-2713</td>
<td>120-140</td>
<td>Amine, Solvent-based, low color</td>
</tr>
<tr>
<td>CXC-1820</td>
<td>120-140</td>
<td>Amine, Water-based, low color</td>
</tr>
<tr>
<td>TAG-2172</td>
<td>120-140</td>
<td>Amine, Low color, more hydrophobic</td>
</tr>
<tr>
<td>TAG-2179</td>
<td>160-180</td>
<td>Amine, Low color, more hydrophobic</td>
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<tr>
<td>TAG-2507</td>
<td>120-140</td>
<td>Covalent, Hydrophobic</td>
</tr>
<tr>
<td>CXC-1767</td>
<td>110-140</td>
<td>Amine, Low color, alternative to pTSA where sublimation is concern</td>
</tr>
<tr>
<td>CXC-1612</td>
<td>80-110</td>
<td>Quaternary, Powder, most efficient product</td>
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<tr>
<td>CXC-1615</td>
<td>100-120</td>
<td>Amine, Liquid, 60% in H2O/alcohol</td>
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<tr>
<td>CXC-1614</td>
<td>100-150</td>
<td>Quaternary, Powder, lowest temperature</td>
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<tr>
<td>TAG-2678</td>
<td>100-150</td>
<td>Quaternary, Powder</td>
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<tr>
<td>TAG-2689</td>
<td>130-170</td>
<td>Quaternary, Powder, improved solubility/stability</td>
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<tr>
<td>TAG-2690</td>
<td>180-220</td>
<td>Quaternary, Powder, highest temperature</td>
</tr>
<tr>
<td>CXC-1613</td>
<td>60-100</td>
<td>Metal, Solvent-based 2K systems</td>
</tr>
<tr>
<td>CXC-1821</td>
<td>80-110</td>
<td>Quaternary, Powder, Non Sb version of 1612</td>
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<tr>
<td>CXC-1756</td>
<td>110-130</td>
<td>Metal, Liquid, water or solvent</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>OH # / AN / EW</th>
<th>Viscosity Range, cPs</th>
<th>Tg</th>
<th>Adhesion</th>
<th>Toughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDR-3314</td>
<td>225-245 (OH#)</td>
<td>10,000 - 12,000</td>
<td>High</td>
<td>Excellent</td>
</tr>
<tr>
<td>CDR-3315</td>
<td>132-145 (OH#)</td>
<td>4,000 - 5,000</td>
<td>Low</td>
<td>Good</td>
</tr>
<tr>
<td>CDR-3316</td>
<td>250-270 (OH#)</td>
<td>1,200 - 1,800</td>
<td>Med</td>
<td>Good</td>
</tr>
<tr>
<td>CDR-3441</td>
<td>135 (OH#) / 30 (AN)</td>
<td>40,000 - 60,000</td>
<td>Low</td>
<td>Best</td>
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<tr>
<td>CDR-3317</td>
<td>340-360 (OH#)</td>
<td>150,000 - 300,000</td>
<td>High</td>
<td>Good</td>
</tr>
<tr>
<td>CDR-3320</td>
<td>190 (EW)</td>
<td>900 - 1,200</td>
<td>N/A</td>
<td>Best</td>
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</tbody>
</table>

**Metal Type**

- **Ferrous**
  - **K-PURE CDI Products**: CDI-4301
- **Ferrous & Soft Metals**
  - **K-PURE CDI Products**: CDI-4303, CDI-4302, CDI-3320, CDI-4311
- **Soft Metals**
  - **K-PURE CDI Products**: CDI-4310, CDI-4308
- **Ferrous & Soft Metals**
  - **K-PURE CDI Products**: CDI-4311, CDI-4312
- **Aluminum**
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**References**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Para toluene sulfonic acid</td>
<td>pTSA</td>
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<tr>
<td>Dodecylbenzene</td>
<td>DDBSA</td>
</tr>
<tr>
<td>Hexafluoroantimonate</td>
<td>SbF₆</td>
</tr>
<tr>
<td>Trifluoroantimonate sulfonic acid</td>
<td>OTf</td>
</tr>
<tr>
<td>Tetrakis (pentafluorophenyl) borate</td>
<td>TPFB</td>
</tr>
<tr>
<td>Acetoacetate</td>
<td>AA</td>
</tr>
</tbody>
</table>