
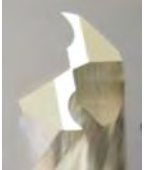

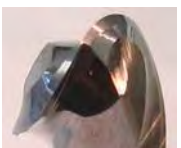
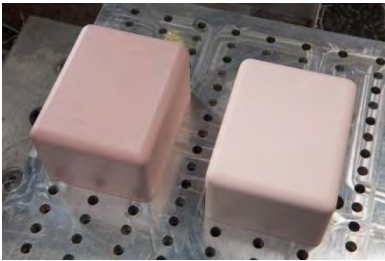


# HYTAC<sup>®</sup> Syntactic Foam & CTB-44 Toolboard Quick Start Machining Guide

Cutter Type	<ul style="list-style-type: none"> <li>• <b>2-flute, plastic cutting tools.</b> 4-flute or metal cutting tools will result in a rough surface that collects plastic buildup and provide inconsistent plug results</li> <li>• <b>Solid Carbide.</b> High speed steel (HSS) is not suitable.</li> <li>• <b>SHARP TOOLS</b> are required. Syntactic foams are abrasive. Check cutting edges and monitor plug surface for evidence of dull tooling. (Dull tools will result in a rough surface that collects plastic buildup and provides inconsistent plug results.)</li> </ul>																																																											
Speed and Feed	<p>For material removal, slotting or profiling:</p> <p><b><u>2 flute up-cut spiral</u></b></p>   <p><i>Pictured: 52-7XX series, Onsrud Tool</i></p> <table border="1" data-bbox="259 766 1421 1018"> <thead> <tr> <th colspan="2"></th> <th colspan="7">Spindle RPM</th> </tr> <tr> <th colspan="2"></th> <th>5,000</th> <th>7,500</th> <th>10,000</th> <th>12,500</th> <th>15,000</th> <th>17,500</th> <th>20,000</th> </tr> </thead> <tbody> <tr> <th rowspan="5">Cutting Diameter</th> <th>3/16"</th> <td><b>50</b></td> <td><b>75</b></td> <td><b>100</b></td> <td><b>125</b></td> <td><b>150</b></td> <td><b>175</b></td> <td><b>200</b></td> </tr> <tr> <th>3/8"</th> <td><b>70</b></td> <td><b>105</b></td> <td><b>140</b></td> <td><b>175</b></td> <td><b>210</b></td> <td><b>245</b></td> <td><b>280</b></td> </tr> <tr> <th>1/2"</th> <td><b>90</b></td> <td><b>135</b></td> <td><b>180</b></td> <td><b>225</b></td> <td><b>270</b></td> <td><b>315</b></td> <td><b>360</b></td> </tr> <tr> <th>5/8"</th> <td><b>100</b></td> <td><b>150</b></td> <td><b>200</b></td> <td><b>250</b></td> <td><b>300</b></td> <td><b>350</b></td> <td><b>400</b></td> </tr> <tr> <th>3/4"</th> <td><b>100</b></td> <td><b>150</b></td> <td><b>200</b></td> <td><b>250</b></td> <td><b>300</b></td> <td><b>350</b></td> <td><b>400</b></td> </tr> </tbody> </table> <p><b>Feed rate shown in bold in inches/minute</b></p> <p><i>Radial depth of cut = 100%      Axial depth of cut = 1 x D</i></p>			Spindle RPM									5,000	7,500	10,000	12,500	15,000	17,500	20,000	Cutting Diameter	3/16"	<b>50</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>	3/8"	<b>70</b>	<b>105</b>	<b>140</b>	<b>175</b>	<b>210</b>	<b>245</b>	<b>280</b>	1/2"	<b>90</b>	<b>135</b>	<b>180</b>	<b>225</b>	<b>270</b>	<b>315</b>	<b>360</b>	5/8"	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>	3/4"	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>
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Speed and Feed	<p>For 3D contouring:</p> <p><b><u>High finish ball nose</u></b></p>   <p><i>Pictured: 65-2XX series, Onsrud Tool</i></p> <table border="1" data-bbox="259 1396 1526 1606"> <thead> <tr> <th colspan="2"></th> <th colspan="7">Spindle RPM</th> </tr> <tr> <th colspan="2"></th> <th>5,000</th> <th>7,500</th> <th>10,000</th> <th>12,500</th> <th>15,000</th> <th>17,500</th> <th>20,000</th> </tr> </thead> <tbody> <tr> <th rowspan="4">Cutting Diameter</th> <th>1/8"</th> <td><b>40</b></td> <td><b>60</b></td> <td><b>80</b></td> <td><b>100</b></td> <td><b>120</b></td> <td><b>140</b></td> <td><b>160</b></td> </tr> <tr> <th>1/4"</th> <td><b>50</b></td> <td><b>75</b></td> <td><b>100</b></td> <td><b>125</b></td> <td><b>150</b></td> <td><b>175</b></td> <td><b>200</b></td> </tr> <tr> <th>3/16"</th> <td><b>50</b></td> <td><b>75</b></td> <td><b>100</b></td> <td><b>125</b></td> <td><b>150</b></td> <td><b>175</b></td> <td><b>200</b></td> </tr> <tr> <th>3/8"</th> <td><b>70</b></td> <td><b>105</b></td> <td><b>140</b></td> <td><b>175</b></td> <td><b>210</b></td> <td><b>245</b></td> <td><b>280</b></td> </tr> </tbody> </table> <p><b>Feed rate shown in bold in inches/minute</b></p> <p><i>Radial depth of cut = 33%      Axial depth of cut = up to 2 x D</i></p>			Spindle RPM									5,000	7,500	10,000	12,500	15,000	17,500	20,000	Cutting Diameter	1/8"	<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>	<b>140</b>	<b>160</b>	1/4"	<b>50</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>	3/16"	<b>50</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>	3/8"	<b>70</b>	<b>105</b>	<b>140</b>	<b>175</b>	<b>210</b>	<b>245</b>	<b>280</b>								
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Coolant	<ul style="list-style-type: none"> <li>• None or air. Chips/dust generated must be cleared from the tool area. Re-cutting chips will quickly dull a tool and may create a fire hazard.</li> </ul>																																																											
Protection	<ul style="list-style-type: none"> <li>• For HYTAC-XTL, B1X, FLX, FLXT, C1R, CTB-44: Safety goggles</li> <li>• For HYTAC-W, WF, WFT: Enclosed chip space, dust extraction, safety goggles, dust mask, protective gloves</li> </ul>																																																											

## *Examples of correctly-machined surface finishes, common problems and solutions*

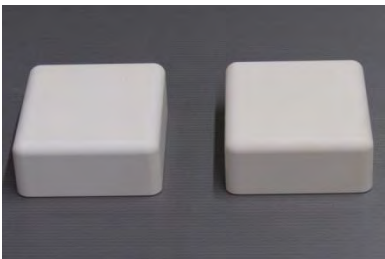
*As machined (XTL, FLX)*



*Sharp tool, accurate & consistent speed (XTL)*



*As machined (W, WF)*



*As machined (FLXT, FLX)*



*Poor or 'fuzzy' surface quality. Possible causes: dull tool, slow feed rate, tool geometry, tool direction (B1X)*



*As polished (C1R)*



*Pockmarked surface. Possible causes: rough plug surface, material sticking (XTL)*

*Excellent clarity as a result of smooth surface (XTL)*

