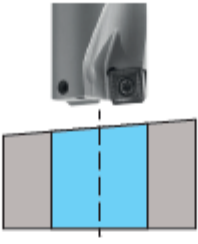
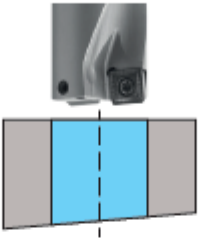
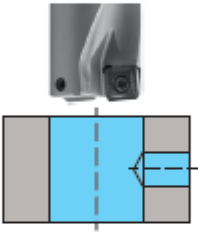
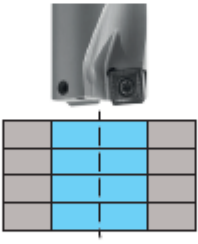
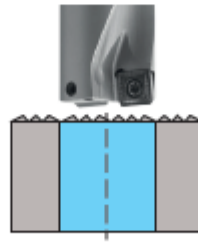
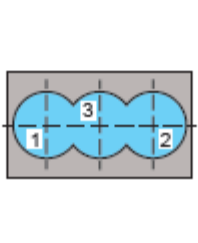


## TYPICAL DRILLING ISSUES

 <p>The diagram shows a drill bit approaching a workpiece with an angled top surface. A dashed line indicates the intended vertical drilling path, while the actual surface is tilted. A small inset photo shows a real-world example of this setup.</p>	<p><b>ANGLED SURFACE</b></p> <ul style="list-style-type: none"> <li>• Reduce feed when starting</li> <li>• <math>&lt;5^\circ</math> reduce by <math>\leq 30\%</math></li> <li>• <math>&lt;10^\circ</math> reduce by <math>\leq 40\%</math></li> <li>• <math>&lt;25^\circ</math> reduce by <math>\leq 50\%</math></li> <li>• <math>&gt;25^\circ</math> reduce by <math>\leq 60\%</math></li> <li>• Use shortest drill possible</li> <li>• If possible, use flat bottom carbide drill or spade drill</li> </ul>
 <p>The diagram shows a drill bit exiting a workpiece. The exit surface is angled, causing the drill to exit at an angle rather than perpendicular to its axis. A dashed line shows the original axis, and a solid line shows the exit path. An inset photo shows a drill bit exiting a plate at an angle.</p>	<p><b>ANGLED EXIT</b></p> <ul style="list-style-type: none"> <li>• At point of exit, reduce feed by <math>\leq 50\%</math></li> </ul>
 <p>The diagram shows a drill bit drilling through a workpiece. At a certain depth, the drill bit encounters a pre-existing hole (cross bore) in its path, indicated by a dashed line. An inset photo shows a drill bit hitting a cross bore.</p>	<p><b>CROSS BORE</b></p> <ul style="list-style-type: none"> <li>• Reduce feed by <math>\leq 50\%</math> at start of interrupted cut</li> <li>• Increase feed once cross bore has been cleared</li> <li>• Be wary of chip clogging</li> </ul>
 <p>The diagram shows a drill bit drilling through a stack of four thin plates. The plates are held together by clamps. A dashed line indicates the drilling path through all layers. An inset photo shows a drill bit drilling through a stack of plates.</p>	<p><b>STACKED DRILLING</b></p> <ul style="list-style-type: none"> <li>• Plates must be clamped rigidly</li> <li>• Maximum permissible gap 0.5mm - 1.0mm</li> </ul>
 <p>The diagram shows a drill bit approaching a workpiece with a highly irregular, wavy top surface. A dashed line indicates the intended drilling path. An inset photo shows a drill bit starting a hole on a rough surface.</p>	<p><b>UNEVEN SURFACE</b></p> <ul style="list-style-type: none"> <li>• Reduce feed when starting by <math>\leq 50\%</math> depending on depth of unevenness</li> <li>• If possible, spot face surface first</li> </ul>
 <p>The diagram shows a sequence of three overlapping holes in a workpiece, labeled 1, 2, and 3. Hole 3 is the central hole, and holes 1 and 2 are positioned on either side, overlapping with hole 3. A dashed line indicates the drilling path. An inset photo shows three overlapping holes in a plate.</p>	<p><b>CHAIN DRILLING</b></p> <ul style="list-style-type: none"> <li>• Drill holes 1 &amp; 2 first</li> <li>• When drilling hole 3, reduce feed by <math>\leq 50\%</math> to cater for interrupted cut</li> <li>• Make overlap <math>&lt; 1.5\text{mm}</math> on diameter if possible</li> </ul>