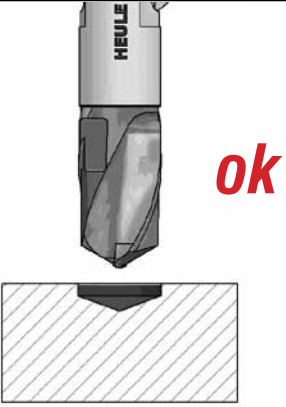
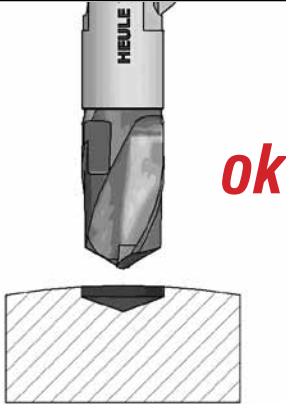
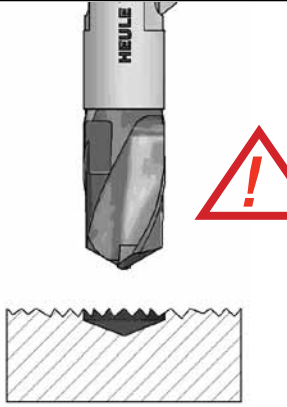
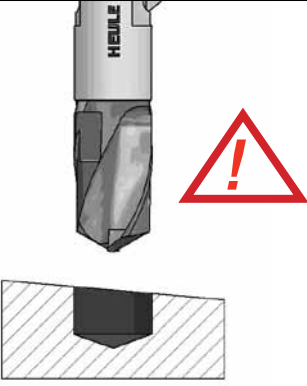
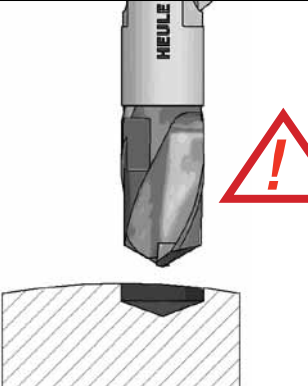
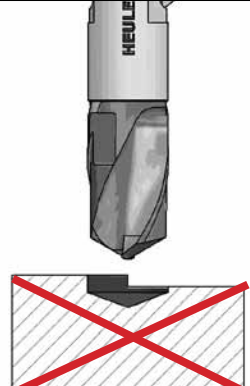
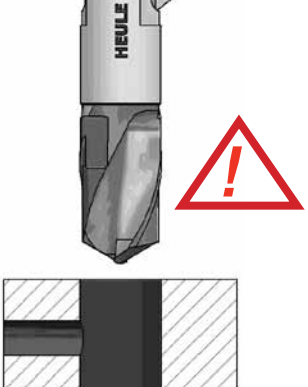
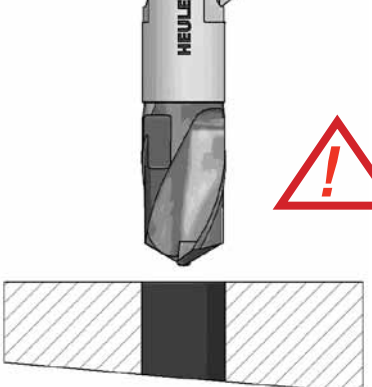
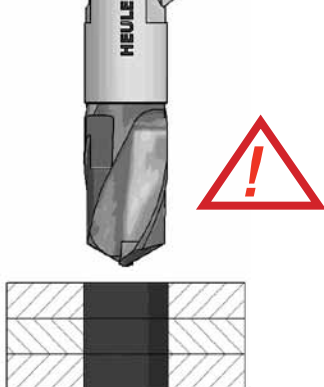


Problem	Explanation	Solution
Built-up material on cutting edge	<ul style="list-style-type: none"> • Cutting Speed is too slow • Feed Rate is too slow • Coating is incorrect for this material • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting Speed • Increase Feed Rate • Change Drill Tip Coating • Adjust coolant flow or position
Chips Jamming in the Chip Gullet	<ul style="list-style-type: none"> • Feed rate is too high for chip evacuation • Drill tip is too short for material thickness • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce feed rate • Use a Peck Drill cycle • Adjust coolant flow or position • Use longer drill
Burr Formation on the Exit of the Bore (see SNAP troubleshooting on page 56 for burr removal issues)	<ul style="list-style-type: none"> • Feed and Speed Rate is too high • Drill Tip worn • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Reduce exit feed 50% • Exchange worn drill tip • Adjust coolant flow or position
Hole size is inconsistent or not symmetrical	<ul style="list-style-type: none"> • Feed is too heavy • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce feed rate • Check stability of set up • Check rotation • Adjust coolant flow or position
Poor Surface finish Quality	<ul style="list-style-type: none"> • Drill Tip worn • Incorrect feeds and speeds • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Exchange worn drill tip • Change feed and speed • Check stability of set up • Adjust coolant flow or position
Chatter during drilling (this must be corrected to avoid tool breakage)	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally insignificant feed rate) • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Increase feed rate • Check stability of set up • Adjust coolant flow or position
Excessive Cutting Edge Wear	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally lacking cutting speed) • Spindle, fixture or set-up is not stable • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting speed • Decrease feed rate • Check stability of set up • Adjust coolant flow or position
Chipping of Cutting Edge	<ul style="list-style-type: none"> • Material building up on Cutting edge (chipping off) • Incorrect feeds and speeds (normally lacking cutting speed) • Spindle, fixture or set-up is not stable • Entering / Exiting on incline, or irregular surface • Insufficient coolant flow 	<ul style="list-style-type: none"> • Increase cutting speed • Reduce feed rate. • Enter / Exit irregularities at 50% of feed rate • Check stability of set up • Adjust coolant flow or position
Excessive Margin Wear (Corner wear or discoloration on Margins O.D.)	<ul style="list-style-type: none"> • Incorrect feeds and speeds (normally excessive cutting speed) • Tool is running out of round • Insufficient coolant flow 	<ul style="list-style-type: none"> • Reduce cutting speed • Check run out • Check stability of set up • Adjust coolant flow or position
Chipping of the Top of the Drill-bit	<ul style="list-style-type: none"> • Drill is deflecting during drilling 	<ul style="list-style-type: none"> • Reduce feed rate • Check stability of set up

 <p style="text-align: right; color: red; font-weight: bold; font-size: 24px;">ok</p>	 <p style="text-align: right; color: red; font-weight: bold; font-size: 24px;">ok</p>	
<p>Drilling of even machined surfaces.</p>	<p>Drilling on central or convex surfaces.</p>	<p>Drilling on uneven surfaces. If necessary reduce feed-rate.*</p>
		
<p>Drilling on angled surfaces.*</p>	<p>Drilling on off-center convex or concave surfaces.*</p>	<p>Drilling on uneven surface in forged or cast iron: Not possible.</p>
		
<p>Drilling through a cross-hole. Ø cross-hole max. 0.5x Ø bore. If necessary reduce feed rate.**</p>	<p>Drilling with angle on back side. Reduce feed rate to about 50-60%*</p>	<p>Drilling through several layers. Seamless fitting of the different workpieces is necessary.</p>

*Chamfer won't be clean.

**Tool can break! Chamfer blade can get stuck in the cross-hole (drive through the bore with no rotation of the tool!)



Grinding may produce hazardous dust. To avoid adverse effects, use adequate ventilation and read MSDS. Cutting tools may break during use. To avoid injury, use proper safety precautions and protective equipment. Use the machine tool with sufficient rigidity and horsepower. Use a cover on a machine tool and protector, such as glasses, against shattering chips and broken tools due to misuse. Do not use insoluble oil because there is a danger of causing fire.