

# Troubleshooting - Application problems with new taps

## Problem

## Possible causes

## Solution

### 1 Thread produced is too large



- incorrect tap, tap geometry not suitable for the application
- tapping size hole too small
- alignment error of tapping size hole or position
- machine spindle axially restricted
- cold welding at the flank of the tap
- lead of tap unsatisfactory due to insufficient thread depth
- cutting speed too high
- lubrication or coolant supply insufficient
- tolerance specification on tap does not correspond to specifications on drawing and/or thread gauge

- apply correct tap for the material to be machined
- observe tapping size hole table in the technical section. Note different tapping size hole diameters for fluteless taps.
- - check for correct tool clamping
- - apply floating tap holder
- - check core drill
- - use mechanical feed
- - apply tension/compression tap chuck
- - apply new tap
- - apply coated tap
- - optimize lubrication
- - tap with forced feed
- - apply tap with modified lead
- - reduce cutting speed
- - improve lubrication
- ensure sufficient and suitable coolant supply and check concentration
- apply correct tap for required tolerances

### 2 Thread axially miscut



- spiral-fluted taps, corresponding to our design, are applied with too much pressure for initial tapping
- initial tapping pressure too low for taps with spiral point corresponding to our form "B"

- with spiral-fluted taps only light pressure required for initial tapping. The tap should immediately be applied within the tension/compression range
- taps with spiral point or left hand spiral require higher axial pressure. Ensure tap operates within the tension/compression range



### 3 Thread produced is too small



- tolerance specification on tap does not correspond to specifications on drawing and/or thread gauge
- incorrect tap
- tap does not cut accurately (thread plug gauge)
- machine spindle is axially too rigid

- apply correct tap for required tolerance
- apply correct tap for the material to be machined
- avoid strong axial forces during the cutting process
- apply tension/compression chuck

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Problem	Possible causes	Solution
<p><b>4 Thread surface not according to requirements</b></p> 	<ul style="list-style-type: none"> <li>■ cutting edge geometry not suitable for the application</li> <li>■ cutting speed too high</li> <li>■ insufficient coolant (concentration and supply)</li> <li>■ chip congestion</li> <li>■ tapping size hole too small</li> <li>■ with tough, hard materials loading on tool too much or pitch too steep</li> <li>■ built-up edge</li> <li>■ cold welding</li> </ul>	<ul style="list-style-type: none"> <li>■ apply "correct" tap for the material to be machined</li> <li>■ - reduce cutting speed</li> <li>■ - optimize lubrication</li> <li>■ ensure suitable coolant and sufficient volume</li> <li>■ apply suitable tap type</li> <li>■ observe tapping size hole diameter specifications to DIN 336 or respective standards. Observe table for fluteless taps</li> <li>■ apply hand tap sets</li> <li>■ apply coated tap</li> <li>■ improve coolant supply</li> </ul>
<p><b>5 Tool life insufficient</b></p>	<ul style="list-style-type: none"> <li>■ surface hardening of tapping size hole</li> <li>■ reasons listed under: "thread surface not according to requirements"</li> <li>■ chip congestion</li> </ul>	<ul style="list-style-type: none"> <li>■ - check drill (cutting edge) for wear</li> <li>■ - heat or surface treatment following thread production</li> <li>■ reasons listed under: thread surface "not according to requirements"</li> <li>■ apply correct tap</li> </ul>
<p><b>6 Tool breakage during advance or return</b></p> 	<ul style="list-style-type: none"> <li>■ tapping size hole too small</li> <li>■ teeth of chamfer lead overloaded</li> <li>■ tap hits bottom of tapping size hole</li> <li>■ - lack of or incorrect chamfer of tapping size hole</li> <li>■ - positional or angle error of tapping size hole</li> <li>■ - tool hardness not suitable for the application</li> <li>■ - cutting edge geometry not suitable for the application</li> </ul>	<ul style="list-style-type: none"> <li>■ observe tapping size hole dia. acc. to DIN 336 or respective standards</li> <li>■ - longer chamfer lead (blind or through hole)</li> <li>■ - increase no. of teeth of chamfer lead by increasing no. of flutes</li> <li>■ - apply tap sets</li> <li>■ - check hole depth</li> <li>■ - apply tension/compression tap chuck</li> <li>■ - correct chamfer angle of tapping size hole</li> <li>■ - ensure correct tool clamping</li> <li>■ - apply floating tap holder</li> <li>■ - check core drill</li> <li>■ apply suitable tap for the individual application</li> </ul>

Technical

## Troubleshooting - Errors and difficulties with reground taps

Problem	Possible causes	Solution
<b>7 Thread produced is too large</b>	<ul style="list-style-type: none"> <li>■ burrs</li> <li>■ cutting edge geometry (chamfer lead, rake-, chamfer-, spiral point angle) not retained</li> </ul>	<ul style="list-style-type: none"> <li>■ remove burrs</li> <li>■ - observe technical specifications when regrinding.</li> <li>■ - observe regrinding instruction</li> </ul>
<b>8 Thread produced is too small</b>	<ul style="list-style-type: none"> <li>■ worn section has not been reground correctly</li> <li>■ tap too small due to no. of regrinds</li> </ul>	<ul style="list-style-type: none"> <li>■ regrind again or apply new tool. Observe max. regrinding limits.</li> <li>■ max. regrinding limit reached. apply new tap</li> </ul>
<b>9 Thread produced not according to requirements</b>	<ul style="list-style-type: none"> <li>■ burrs</li> <li>■ cutting edge geometry (chamfer lead, rake-, chamfer-, spiral point angle) not retained</li> <li>■ peak-to-valley height of the reground tap too large</li> <li>■ cold welding at the flanks</li> </ul>	<ul style="list-style-type: none"> <li>■ remove burrs</li> <li>■ - observe technical specifications when regrinding.</li> <li>■ - observe regrinding instruction</li> <li>■ regrind again or apply new tool. Observe max. regrinding limits.</li> <li>■ remove cold welding marks</li> </ul>
<b>10 Tool life insufficient</b>	<ul style="list-style-type: none"> <li>■ cutting edge geometry (chamfer lead, rake-, chamfer-, spiral point angle) not retained</li> <li>■ loss of tap hardness due to heat development during the regrinding process</li> <li>■ loss of coating</li> </ul>	<ul style="list-style-type: none"> <li>■ regrind again or apply new tool. Observe max. regrinding limits.</li> <li>■ - check quality of grinding wheel</li> <li>■ - check coolant supply</li> <li>■ - recoat</li> <li>■ - check coating of the material to be machined</li> </ul>