

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

Technical

Troubleshooting - Errors and difficulties with reground taps

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