

Realized TCM project with step drill extreme design:

Production of 150 pieces of holes with double counterbore on customer's component.

Material St 52 - 3

Drilling diameter 5 mm (core hole for M6 thread) with countersinks 90° and 125°

Largest counterbore diameter 13,5 mm

Extreme width of step , special carbide blank

Current production at the customer:

Tool 1 standard solid carbide step drill Dia 5 mm , drilling depth 13 mm	1,2 sec
Toolchange	5,0 sec
Tool 2 solid carbide countersink 90°	1,5 sec
Toolchange	5,0 sec
Tool 3 inserts countersink 125° special tool	2,8 sec

Total machining time / part : 10.2 sec x 150 holes = 25.4 min

TCM Optimization:

VHM special step drill Dia 5 mm, shank diameter 14 mm

Both countersink steps with 90° and 125° integrated

Internal cooling, TiAlN PVD coating

Special cooling channel blank and optimized carbide grade

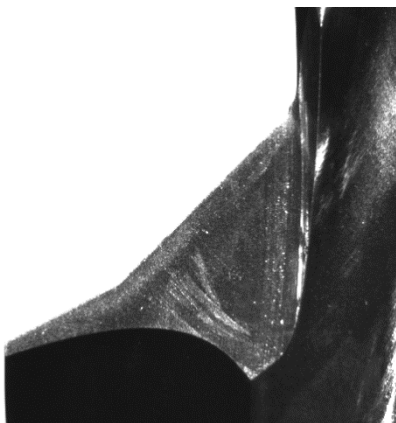
2 different sizes of flutes

Polished flutes

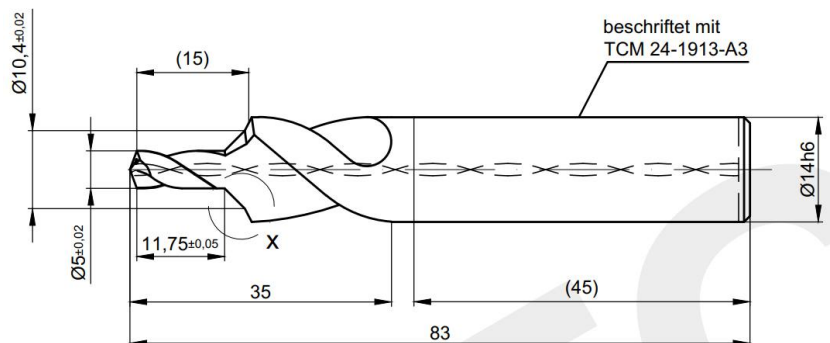
Correction grinding +5° on both countersink cutting edges

Significantly lower tool costs, than the three tools actually used by the customer.

Correction grinding countersink



Tool drawing



Results:

Production of the entire bore with only one tool and by one step.

No additional toolchanges!

Special CNC drilling program programmed for reliable chip removal.

Short chips, also on the countersink cutting edges.

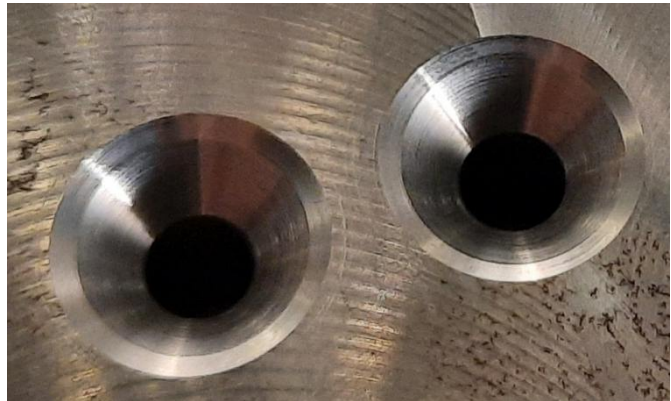
First - test of the tool in TCM machining laboratory.

Technology transfer of the ready solution to the customer.

Test tool



Drilled holes



Total machining time / component TCM new: 4.8 sec x 150 holes = 12 min

Simulation of the drilling process with NX CAM software, before the first use of the tool.

