HEIDENHAIN

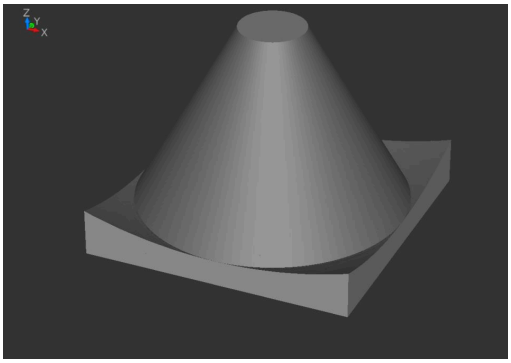
NC Solutions

Description of NC Program 4035

English (en)
5/2020

1 Description of NC program 4035_en.h

NC program for machining a taper by inclining the tool and through subsequent turning of the workpiece.



Requirement

Machine a taper. In order to attain the required surface definition for the tapered surface, use the hobbing machining process for this surface. A 5-axes machining tool with B swivel head and C rotary table is available to you. Keep the effort for setting up the workpiece to a minimum. For this reason, you want to start the machining process without having to clamp the tool in the center of the rotary table.

The example program was created for a machine with a B swivel head and a C rotary table. If you are using a machine with a different kinematics, you must adapt the NC program.

The machine being used must be set up for simultaneous machining.

NC program 4035_en.h

In the NC program, first define the blank form. Then the control calls the tool. Subsequently, define the parameters required for machining.

Then the control performs three calculations. First, it calculates the Z coordinate of the milling path from the depth, the inclination angle, and tool radius Q108. The calculated coordinate refers to the center of the tool. In the second calculation, the control calculates the radius of the milling path from the inclination angle, the tool radius, and the taper bottom diameter. The radius also refers to the center of the tool. In the third calculation, it calculates the X coordinate for pre-positioning from the tool radius and the bottom taper diameter.

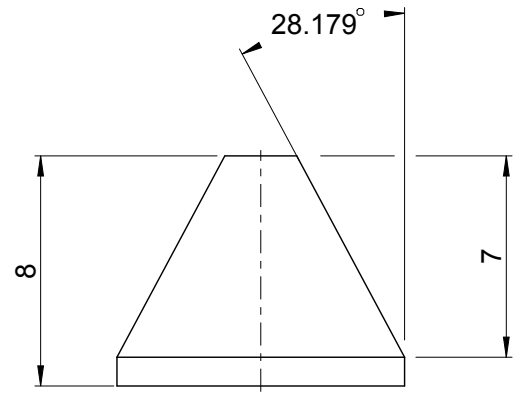
After the calculations have been completed, the control pre-positions the tool to the calculated position. Subsequently, it moves the tool in the tool axis to the set-up clearance. Then it positions the tool to the Z surface.

In the following NC block, the control uses function M128 to activate the TCPM function. This function keeps the tool tip at the programmed position when positioning the rotary axes. In the same NC block, the control positions the B axis to the inclination angle. Then the control moves the tool to the calculated Z coordinate of the milling path. Subsequently, it moves the along the calculated radius in the X axis.

Then the control sets the circle center point at the center of the workpiece. Then it moves along a 360° circular path around the circle center point and rotates the C axis by 360° in the same NC block. Subsequently, the control moves the tool in the X axis to the coordinate for pre-positioning. Then it position the B axis to 0° and deactivates the TCPM function.

In the final step, the control retracts the tool in the Z axis. Then it ends the NC program.

Parameter	Name	Meaning
QL100	DEPTH	Depth of the lower edge of the taper
QL101	LOWER DIAMETER	Diameter of the taper at the lower edge
QL102	ANGLE	Inclination angle of the tool for machining the taper surface



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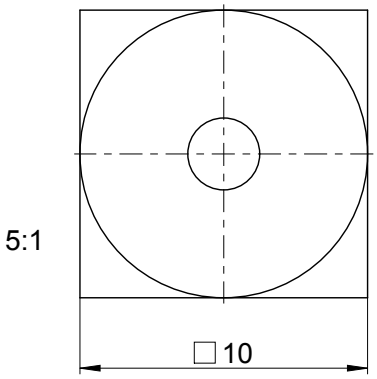

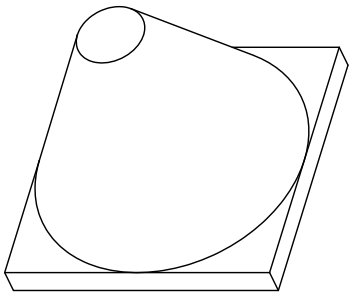

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				ID number
Text:				Change No. C000941-10 Phase: Nicht-Serie
	Original drawing Scale / Format	Platte Plate Einzelteilzeichnung / Component Drawing		Werkstoff: Material:
RoHS	1:1 / A4			●blanke Flächen/Blank surfaces
Maße in mm / Dimensions in mm				
Werkstückkanten nach ISO 13715 Workpiece edges ISO 13715 -0.3 +0.3	Allgemeintoleranzen ISO 2768-mH ≦6mm: ±0,2 General tolerances ISO 2768-mH ≦6mm: ±0,2		Tolerierung nach ISO 8015 Tolerances as per ISO 8015	Oberflächen nach ISO 1302 Surfaces as per ISO 1302
			Oberflächenbehandlung: Surface treatment:	

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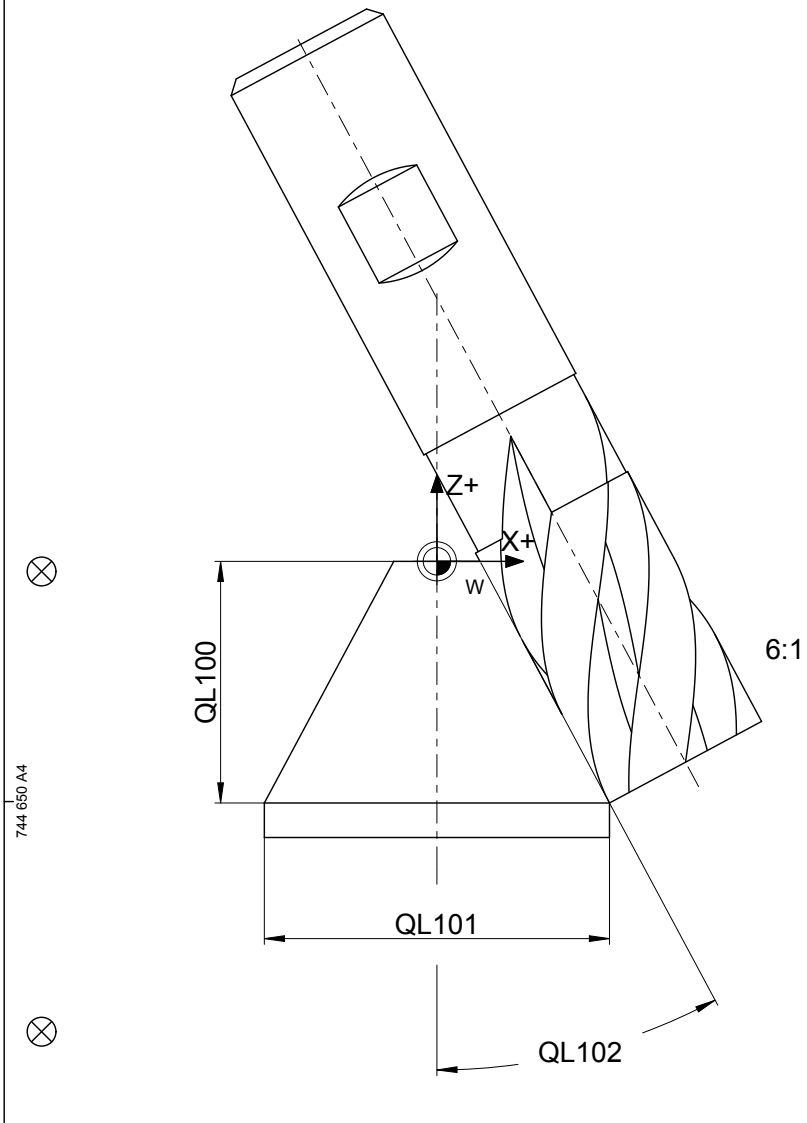

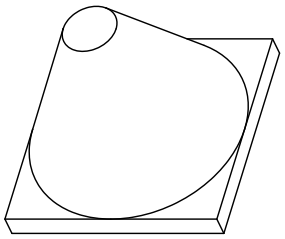

			ID number
Text:			Change No. C000941-10 Phase: Nicht-Serie
Original drawing Scale: 1:1	Format: A4	Platte Plate Montage-ZZ / Assembly Drawing	Werkstoff: Material:
RoHS			●blanke Flächen/Blank surfaces
Maße in mm / Dimensions in mm			
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