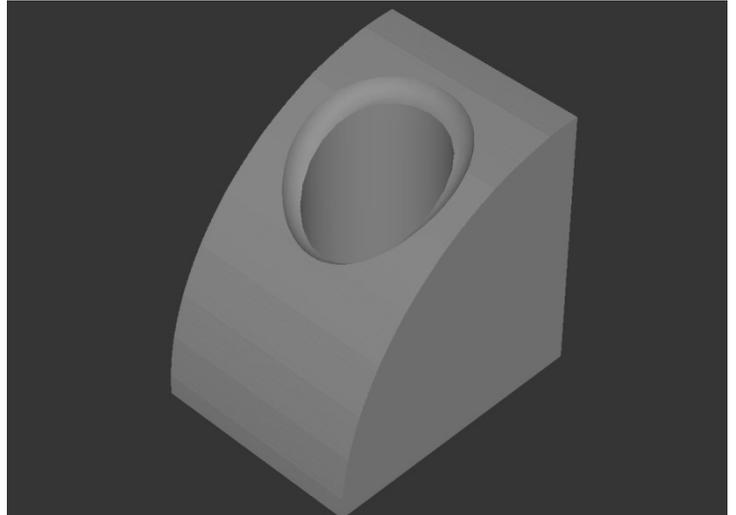




## Description of Program 5010-en.h

Program for deburring a hole drilled into a horizontal cylinder.



**Important! The cylinder axis must be parallel to the Y axis!**

### Description:

In this program, a hole in a horizontal cylinder is deburred from outside with a ball-nose cutter. The position of the hole, the radius of the hole and cylinder, as well as other settings can be made easily by parameter. The program also shows the machining of the cylinder and the hole. This serves primarily for graphic simulation and can be deleted if it isn't needed.

### Program 5010-en.h

- First, all required parameters are assigned in the program.
- This is followed by operations that are not necessarily required for deburring but rather in order to be able to depict machining in the test run. If they are not needed, the parts can be deleted.
- Initially, the outside surface of the cylinder is milled with a ball-nose cutter. The path contour for this is described in a second program that is called by PGM call.
- Then, a hole is drilled in the cylinder using a drill.
- Now the actual deburring process begins.
- At first, a ball-nose cutter is called and then compensated in length by the ball radius so that the calculated path is given with respect to the ball center.
- This is followed by several calculations before the tool is pre-positioned.
- Then the Z depth needed at the starting position is calculated and reached.
- The next position is then calculated. The angle is calculated from the current angle plus the angle step calculated from the pitch. The Z depth that has to be moved to at this newly calculated angle is then



determined. Both, the angle and the Z coordinate are moved to in a circular polar motion.

- This step is repeated until the complete circular path has been traversed.
- Finally, the tool is retracted and the program is ended.

### Parameter description for 5010-en.h

- Q1=.....;HOLE CENTER IN X AXIS
- Q2=.....;HOLE CENTER IN Y AXIS
- Q3=.....;DEPTH OFFSET OF TOOL  
*The tool path for deburring is calculated for the center of the tool's ball nose. If this depth is to be changed, a positive value can be entered for a small plunging depth, or a negative value for a larger plunging depth.*
- Q4=.....;LATERAL OFFSET OF TOOL  
*The tool path for deburring is calculated with compensation for the radius, i.e. so that the tool would not remove any material on the hole floor. The value given in Q4 is now the value by which the tool is moves at an offset to the radius-compensated path in order to remove material. **Tip! The value should not be greater than the tool radius.***
- Q5=.....;PITCH OF CIRCULAR PATH  
*This parameter specifies the number of segments into which the path is divided. The larger the pitch, the more accurately the path is calculated. This takes more computing time, however.*
- Q6=.....;CYLINDER RADIUS
- Q7=.....;STARTING ANGLE IN THE PLANE  
*Polar angle at which deburring is to begin.*
- Q8=.....;LENGTH OF CYLINDER  
*This parameter is required for pre-roughing the cylinder. It has no function during deburring.*
- Q9=.....;HOLE RADIUS
- Q10=.....;Z HEIGHT FOR PRE-POSITIONING
- Q11=.....;FEED RATE FOR PLUNGING  
*This parameter refers only to deburring, not to the drilling cycle or pre-roughing.*
- Q12=.....;FEED RATE FOR MILLING  
*This parameter, too, refers only to deburring.*