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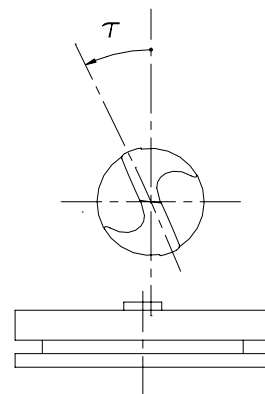
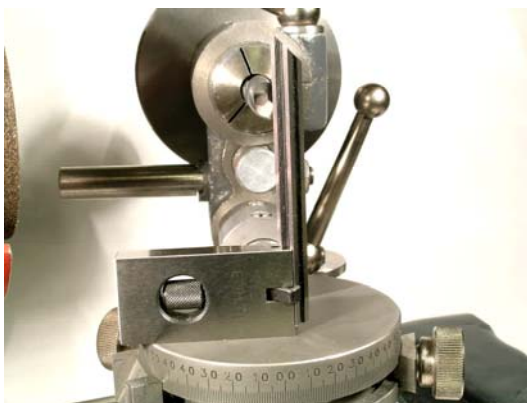
In Six Steps to a Perfect Four-Facet-Drill with the QUORN Tool and Cutter Grinder

Introduction

This alternative method for drill sharpening uses a four facet grinding approach that only requires alteration to the rotary table and the front bar micrometer. It is suitable for sharpening standard helical drills from say up 1mm diameter to the maximum limited only by the collets and provides them with self centring characteristics.

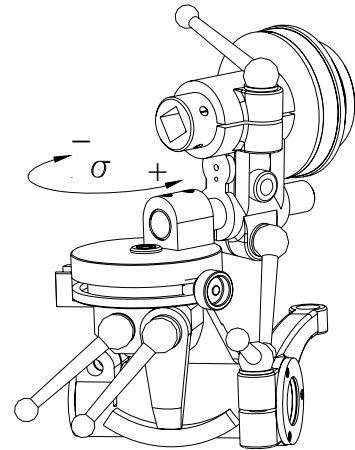
1. Drill alignment and angular positioning

Set the drill in the tool holder collet and use a square or setting pin to align carefully the vertical axes with the cutting edges before applying the 7.8 degree angular set.



2. Setting the rotary table stops

To achieve a 5 degree primary clearance angle, set the two stops on the rotary table to -1.1 degrees, noting the sign convention shown on the diagram. For the secondary clearance angle of 25 degrees, set the stops to -24.5 degrees.



3. Setting the tilting bracket

The tilting bracket is set to $\rho = 31$ degrees.



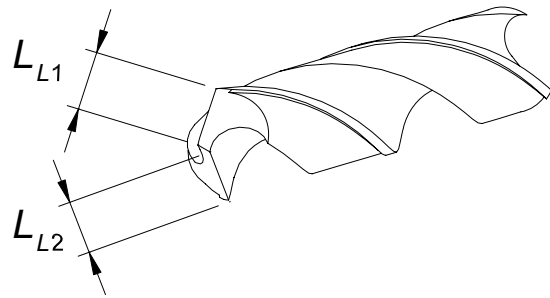
4. Grinding the first facet for both lips

The rotary table is set to -1.1 degrees. Both lips are ground to the same setting of the front bar micrometer by swinging the work head in the usual way about the bar's axis.

5. Balancing the cutting edges

To ensure the drill cuts to size it is important that the cutting edge lengths are equal. Check measure and correct by increasing the front bar feed

$$0.43 \cdot |L_{L1} - L_{L2}| \text{ for the shorter lip.}$$



6. Grinding secondary clearances

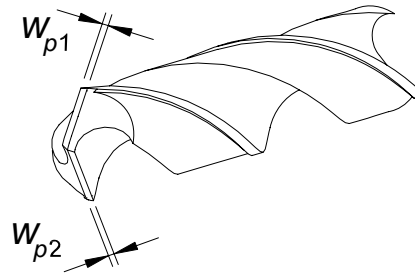
Set the rotary table to -24.5 degrees as explained in 2. above. Grind the two lips to symmetrically split the centre point of the drill.

The formed lips must be of equal width. Measure the two lip's

distance d_L . and for both primary facets the distances w_{p1} and w_{p2} .

Correct by increasing the front bar feed individually $0.34 \cdot (w_{p1} - d_L / 2)$

and $0.34 \cdot (w_{p2} - d_L / 2)$.



Enhancement to a Six-Facet-Drill

7. Setting the Quorn for the third pair of facets

Increase according to the figure in **1**. the angle τ by 22.4 degrees to totally 31.3 degrees and the rotary table to -32.8 degrees, noting the sign convention shown on the diagram in **2**.

8. Grinding tertiary clearances

Grind the two lips to symmetrically split the centre point of the drill. The edge between the secondary and tertiary clearance must meet the drill's central axis too.. Measure the two edge's distance d_E . from the centre. Correct by increasing the front bar feed individually $0.31 \cdot d_E$.