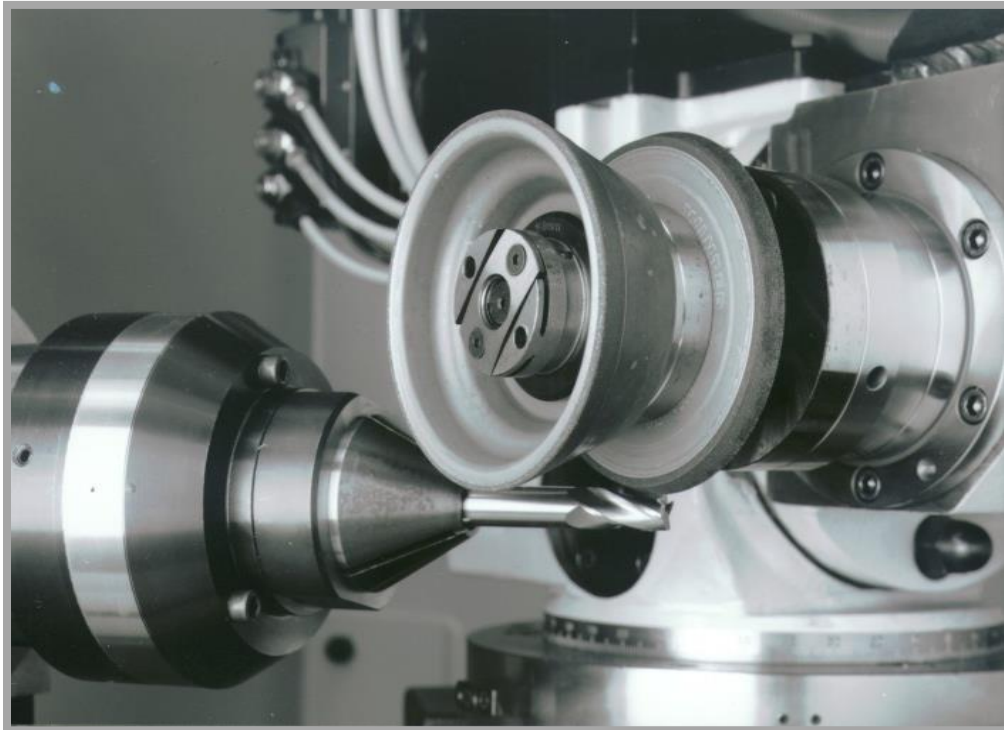


# High Performance grinding wheel for Fluting, Gashing and Clearance

**WINTER**  
SAINT-GOBAIN



  
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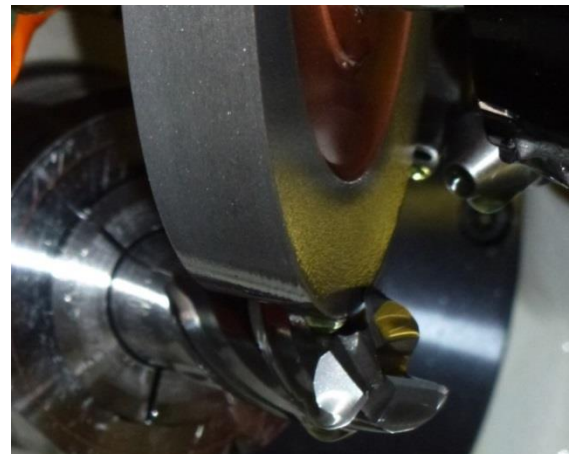
**Flute grinding** is the most time-consuming and thus most cost-intensive manufacturing step during drill and end mill production. It is necessary to optimize the machine and cooling lubricant systems as well as the abrasives. In recent years, machines have become more compact, spindle power has increased, axis paths have been reduced and machine controls have become more efficient. At the same time, WINTER has developed flute grinding tools which meet these increasing requirements and which now enable the improved machine capacity to deliver a higher and more economic output. Matched to the application and the system environment, innovative WINTER flute grinding wheels are always the best solution.

## Application

→ Flute grinding for shank tools such as drills, end mills, reamers, mini drills, mini end mills in various Tungsten Carbide and High Speed Steel grades.

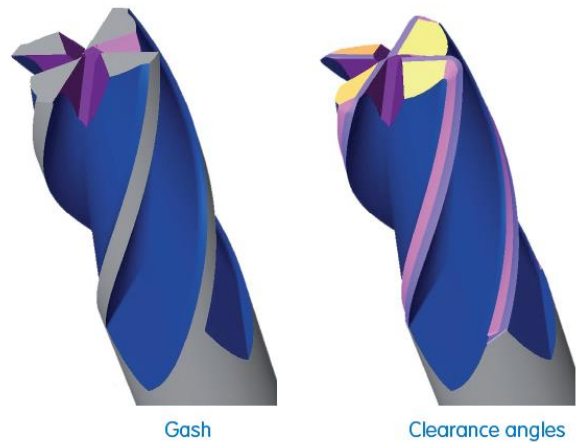
## Advantages

- ✓ Very cool grinding
- ✓ Significant lower spindle load
- ✓ Less sensitive for "loading" at lower feed rates.
- ✓ Good profile holding by avoiding of stick dressing



# V-PRO

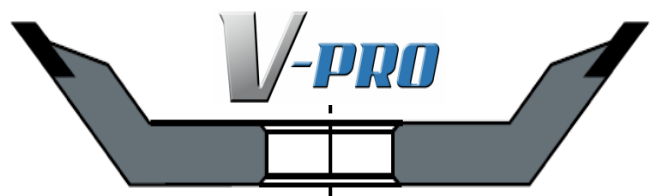
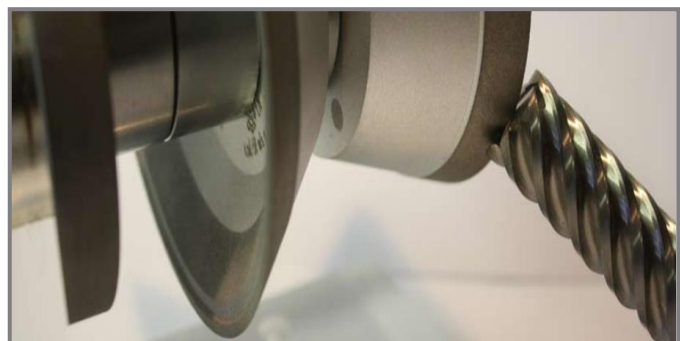
**Gashing** reduces the width of the chisel edge of a drill or end mill in order to reduce the forces during subsequent use of the tool. 12V9 wheels or pointed 1V1/14V1 wheels are generally used (the typical angle is 45°). Occasionally, 1A1 and 11V9 wheels are used. The advantage of 1V1 wheels over 12V9 wheels is a more rigid body.



**Clearance angles** grinding on the cutting edge of a tool reduces the contact area between the tool and the workpiece during drilling or milling processes. One or two clearance angles are usually ground on the face. Up to two clearance angles / clearances can be produced on the circumference; on some tools these take the form of radial clearance grinding. For grinding clearance angles 11V9 cup wheels or similar geometries are typically used.

## Application

→ Gashing and Clearance angles grinding for shank tools such as drills, end mills, reamers, mini drills, mini end mills in various Tungsten Carbide and High Speed Steel grades.

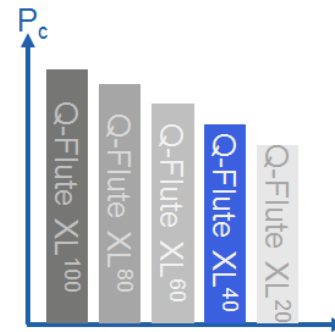
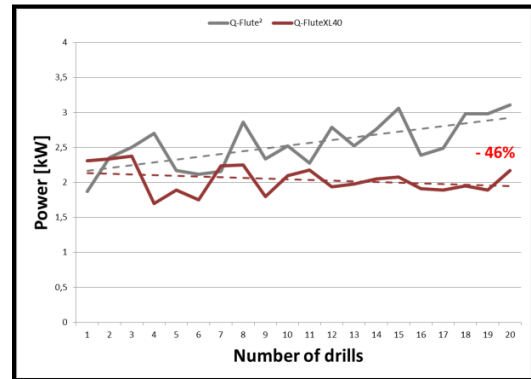


## CASE STUDY –



### Grinding of TC shank tools

- ▶ **Periphery**
  - Machine: Walter Helitronic
  - Coolant: Oil
- ▶ **Work piece**
  - TC Drill; Ø10 mm
- ▶ **Grinding wheel**
  - D54 Q-FluteXL<sup>40</sup>
- ▶ **Operating parameter**
  - Depth of cut  $a_e = 3,5$  mm
  - Cutting speed  $V_c = 18$  m/s
  - Feed rate  $V_f = 200$  mm/min
  - MRR  $Q'w = 11,6$  mm<sup>3</sup>/mm s
- ▶ **Benefit**
  - 40% reduced spindle load
  - 20% shorter cycle time
  - Significant lower thermal stress for the work piece



## CASE STUDY –



### Clearance grinding on TC shank tools

- ▶ **Periphery**
  - Machine: Walter Helitronic
  - Coolant: Oil
- ▶ **Work piece**
  - TC end mill; Ø12 mm; 4 Flutes; 20° Helix
- ▶ **Grinding wheel**
  - 3SP11V9-100-3-10 20 \*D64 V-PRO4073 C125 D
- ▶ **Operating parameter**
  - Depth of cut  $a_e = 1.2$  mm
  - Cutting speed  $V_{c1} = 25$  m/s;  $V_{c2} = 20$  m/s
  - Feed rate  $V_{f1} = 70$  mm/min;  $V_{f2} = 100$  mm/min
- ▶ **Benefit**
  - 4 times longer dressing interval
  - Huge time savings
  - Significant increase in productivity



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