

# Flute grinding

Due to the high material removal rates as well as high precision requirements, flute grinding is one of the most important and challenging steps when manufacturing drills and milling cutters. To grind flutes, it is necessary to continuously optimize the machines and cooling lubricants as well as the grinding wheels. To meet these growing demands, we have developed innovative grinding tools in cooperation with our partners.

We offer the optimal product solution for every combination of machines and materials as well as for every grinding requirement.

## Special features of flute grinding:

- Grinding process that has a decisive influence on the quality of the workpiece
- Deep grinding process
- Complex longitudinal-peripheral-surface grinding process
- Contact surfaces that are hard to reach by the cooling lubricant
- High thermal loads – often resulting in low feed rates and shallow flute depths
- Flute depth, flute width, flute form, and the grinding forces resulting from them require a grinding wheel specification that matches these parameters



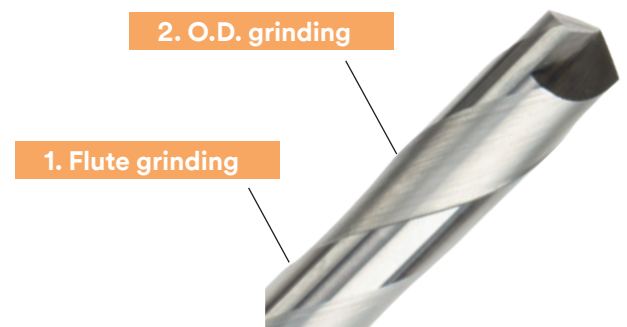
### Our products and services

- Highest possible profile retention & cutting capability
- Especially high removal performance
- Easy to profile
- Competent service

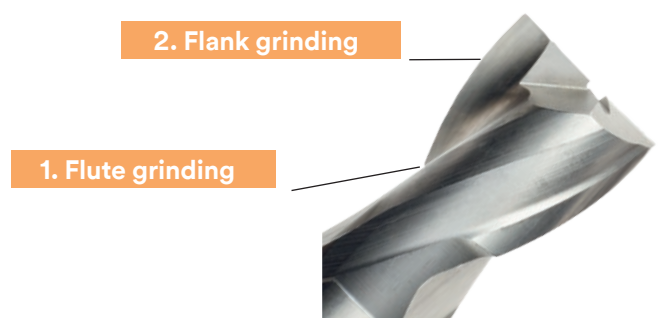
### Your application advantages

- Increase in productivity
- Shorter cycle times
- Reduced grinding costs

## The flute on a drill



## The flute on a milling cutter



# Our products:

## 3M™ Metal hybrid bonded diamond grinding wheels 6PHN with NF-Bond

With the products known to date, low cutting depths and feed rates were required in order to protect the workpiece and the tool against thermal damage. The 3M™ 6PHN with NF-bond, though, are ideal for fast deep grinding. They have already proven their removal performance with simultaneously high stability in a wide variety of applications. These wheels are especially suitable for high performance machines.

## 3M™ Metal hybrid bonded diamond grinding wheels 6PHN with NFMax-Bond

The cutting capability of synthetic resin and ceramic bonds with the profile resistance and the stability of metal bonds make the 3M™ 6PHN with NFMax-Bond the perfect grinding tools for producing flutes. Due to its outstanding grinding properties when deep grinding with very high removal rates and simultaneously low wear, the new generation is especially well suited for grinding large contact surfaces, at high material removal rates, and workpieces with diameters from 10 to 20 mm.

## 3M™ Resin bonded diamond grinding wheels 6PBP

Special resins and the addition of innovative additives lend those grinding wheels great flexibility with simultaneously high edge stability. These wheels are therefore suitable for flute grinding when manufacturing tools as well as when sharpening them. These wheels are especially suitable for sharpening worn tools on high performance machines.

lower	Profile retention		higher
3M™ 6PBP	3M™ 6PHN with NFMax-Bond	3M™ 6PHN with NF-Bond	
Synthetic resin bond	Hybrid metal bonding	Hybrid metal bonding	
Good removal performance	Highest removal performance	High removal rates	
Good edge stability	High profile retention	Highest profile retention	
Suitable for grinding operations with low feed rates	Suitable for grinding operations with high feed rates	Suitable for grinding operations with the highest feed rates	
Suitable for oils and emulsions	Suitable for oils and emulsions	Suitable for oils and emulsions	
Ideal for resharpener operations	Ideal for large contact surfaces (production)	Ideal for medium contact surfaces (production)	



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