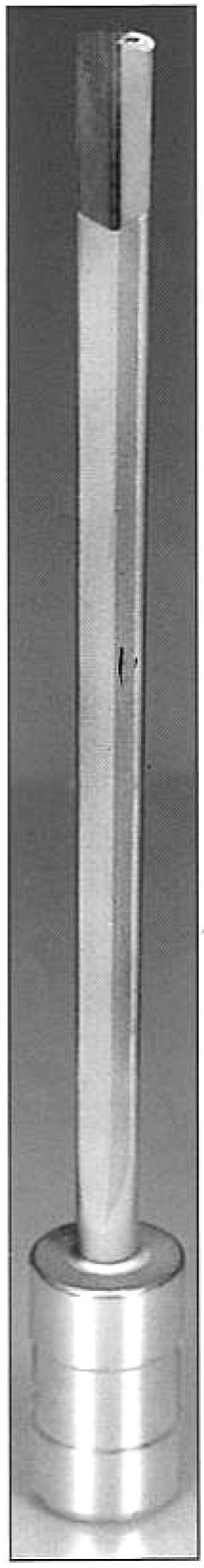
# Composition of OUTILTEC Gun Drill

The **STANDARD** Gun Drill consists of a single-piece carbide head, a streamlined tube and a driver. A characteristic of the gun drill is its transmission of lubricant via the inside of the shank and evacuation of chips via the V-shaped external flute.



## The Drilling Head

The head is single-piece carbide and has a back taper on its circumference to reduce friction. This depends on the machined material. (This drilling head taper results in a reduction of diameter and the dispersion of tolerance on the diameter increases during resharpening.) For high precision drilling, the taper is reduced to a minimum.

## The Shank

The shank is a streamlined hardened tube that includes a V-shaped longitudinal flute. Essential criteria are the highest possible resistance to twisting and a sufficiently large section to ensure the passage of cutting liquid and chip evacuation via the V flute.

## The Driver

The driver ensures the connection between the tool and machine tool, see page 6.

Advanced **OUTILTEC** gun drill technology provides high geometric and dimensional quality for deep or shallow drilling during machining.

# Utilization of the Gun Drill on conventional machines and machining centers

The Gun drill is not a self-centering tool and must therefore be externally stabilized at the drill outlet. As a general rule this can be done by a guide barrel (Fig. 1) (if the machine design allows it) or by a corresponding centering on the gun drill (Fig. 2). In this way, the gun drill can be used on a machining center. As soon as the tool is engaged into the full material, it is self-guided by its guiding blocks. The cutting force transmitted to the guiding blocks allows calibration and burnishing of the hole. For maximum friction restraint, each head shape is produced in function of the machined material.

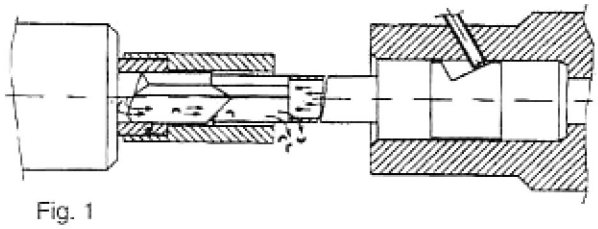


Fig. 1

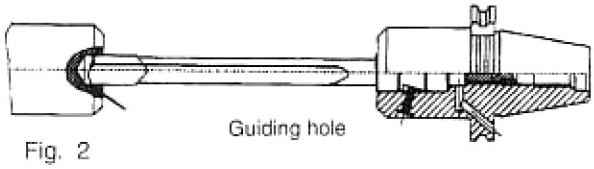
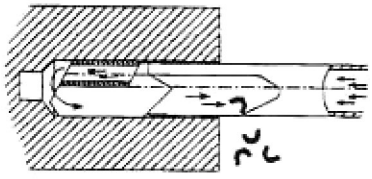



Fig. 2

On principle, two types of drilling can be distinguished:

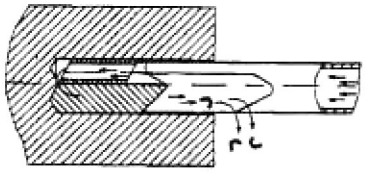
- Full drilling and boring of the blind hole. In this type of use, cutting liquid and chips are evacuated by the flute.
- Boring of drilled holes or cored castings; in this case, liquid and chips are evacuated to the front. This permits the use of a tool with round tubes.



Boring with evacuation of chips and lubrication opposite to the boring direction

Fig. 3

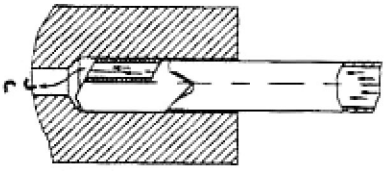
The machinabilitiy and fractionation of chips depends on the material type and its uniformity. Chips shape and size condition their correct evacuation. Chips shape can be modified by varying the tool cutting speed, feed and sharpening angle parameters.



Full drilling with evacuation of chips and lubricant opposite to the drilling direction.

Fig. 4

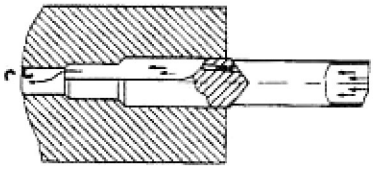
## Drilling Advantages



Boring with evacuation of chips in the boring direction.

Fig. 5

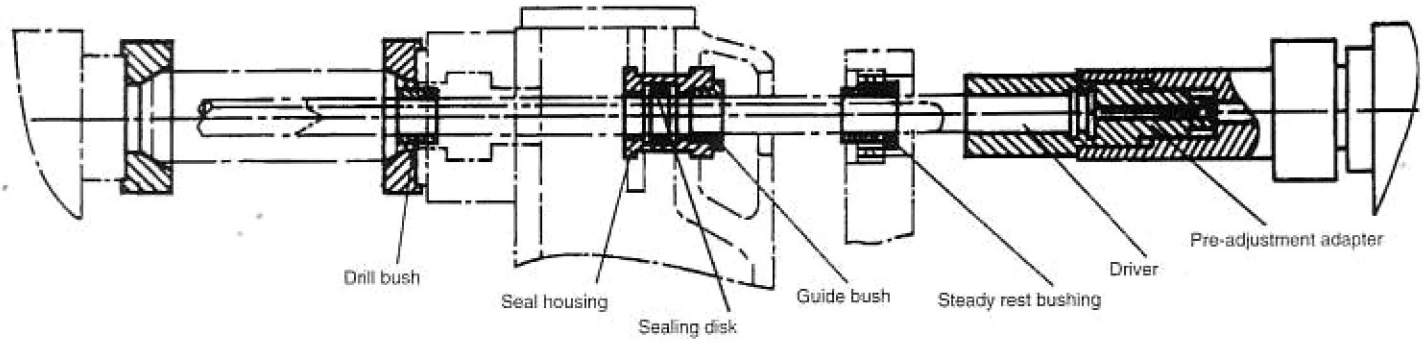
- IT7 to IT 9 tolerances are obtained
- Better straightness and concentricity
- Reduced deviation
- Surface condition (RA 0.4 to 1.6) is directly obtained
- Often makes reboring operations unnecessary



Boring with a staged tool. Evacuation of chips and lubricant in the boring direction.

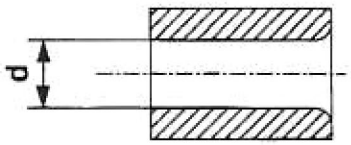
Fig. 6

# Drilling Machine Accessories



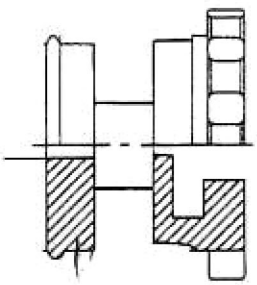

## Drill bushes

Based on modified DIN 179. Indicate the ``d´´ diameter of the tool needed for your requirements. Carbide barrel delivered on request.




## Seal housing

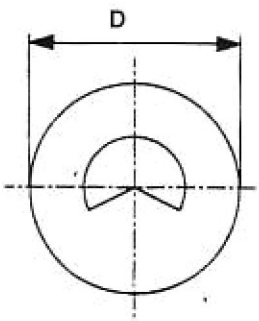
Indicate the dimensions needed for your requirements.



## Sealing disk

**Single sealing disk or with protection sheet.**
Indicate the dimensions needed for your requirements.

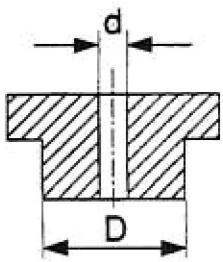
| Ø Foret d | Dia. D |
|---|---|
| - 6,6 | 20 |
| 6,6 - 18,5 | 32 |
| 18,6 - 24,6 | 40 |
| 24,7 - 42 | 90 |




## Guide bush

Indicate the ``d´´diameter of the tool needed for your requirements.

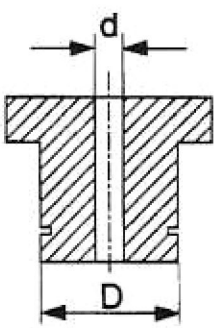
| Dia. D |
|---|
| 18,5 |
| 22,5 |
| 24,5 |




## Steadyrest bushing

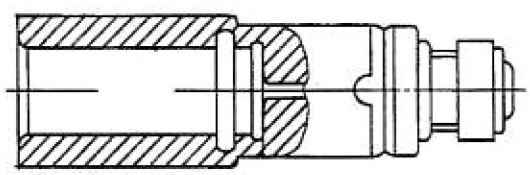
Indicate the ``d´´ diameter of the tool needed for your requirements.

| Dia.D |
|---|
| 30 |
| 45 |




## Pre-adjustment adapter

(based on request)



Other accessories available on request

# Quality achieved

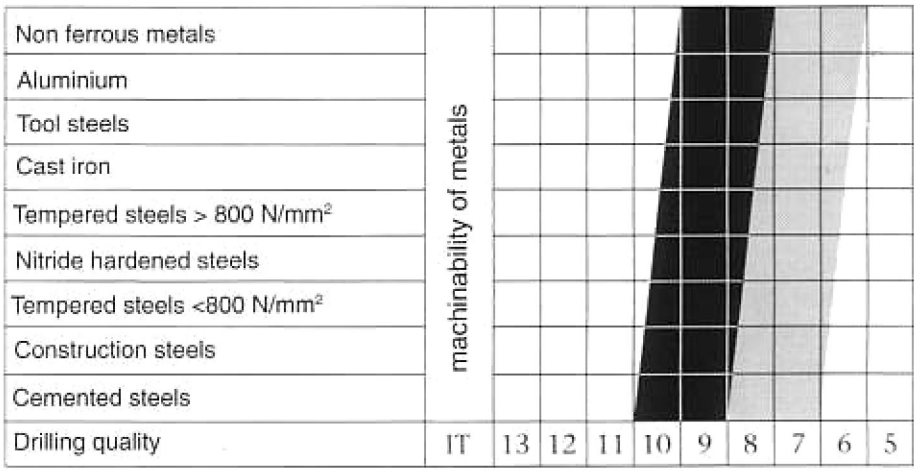
## Drilling tolerances that can be obtained during deep drilling

(Approximate values)

At production, these gun drills make it easy to obtain IT8 to IT9 class tolerances or even tolerances of a stricter value, in the case of optimal application or when used with special tools.

Values obtained under normal conditions

Values obtained under optimal conditions

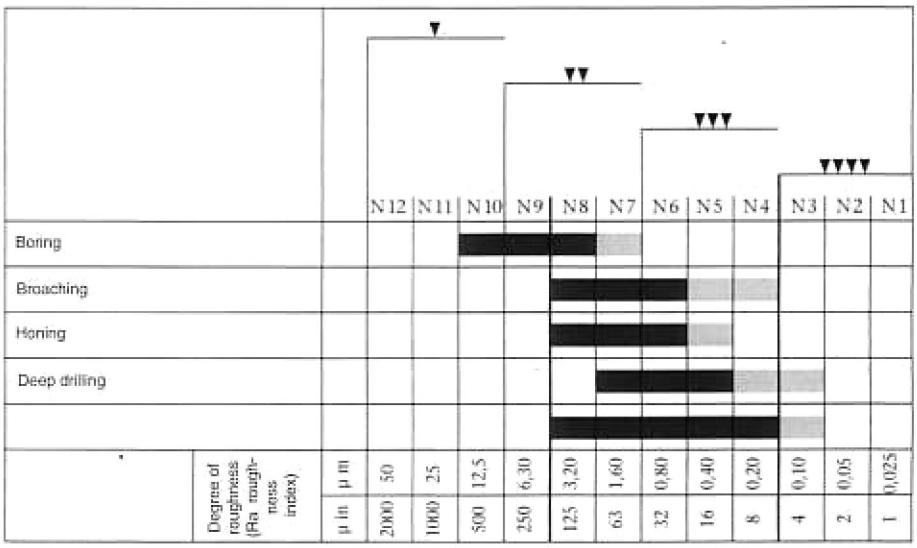



## Obtained surface qualities

Values of 0.1 Ra can be obtained with a gun drill

Values that can be obtained under normal conditions

Values that can be obtained under optimal conditions




## Straightness and Concentricity

The results obtained depend on different factors such as:

- drilling depth and diameter
- type of machining and cutting parameters
- quality and uniformity of the workpiece material
- machine tool condition

## Circularity

The geometric quality of bores obtained from deep hole drilling drill bits is clearly higher than that obtained with the use of twist drills. It is possible to obtain precision with deviations of less than 4 µm