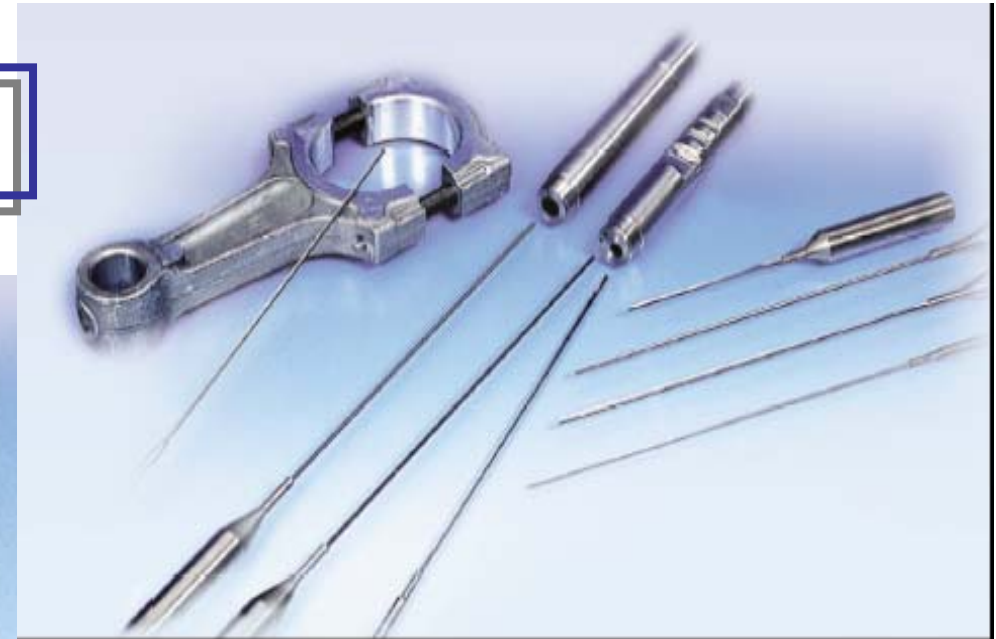
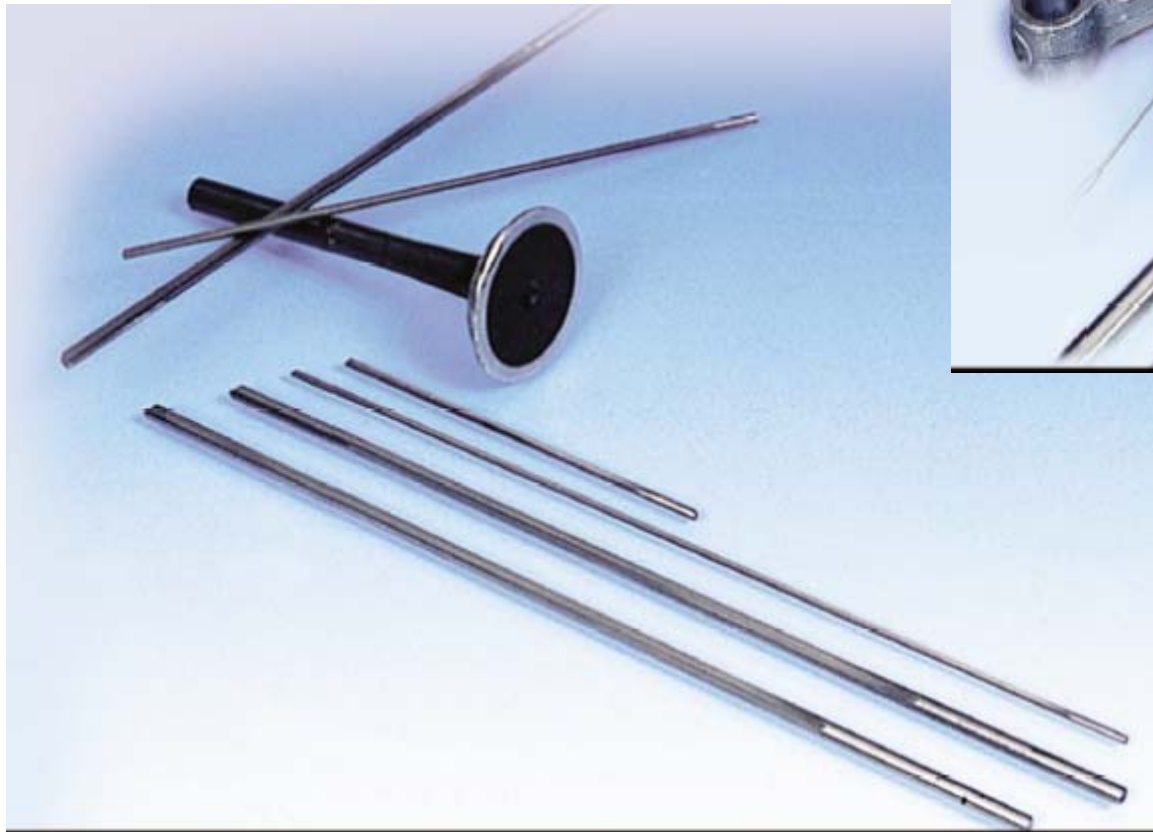


DEEP HOLE DRILLING



Information and solutions
by SOMEX

DEEP DRILLING HOLE



We call deep drilling the operations achieved with tools to one lip of cut called “Tools 3/4 “ .

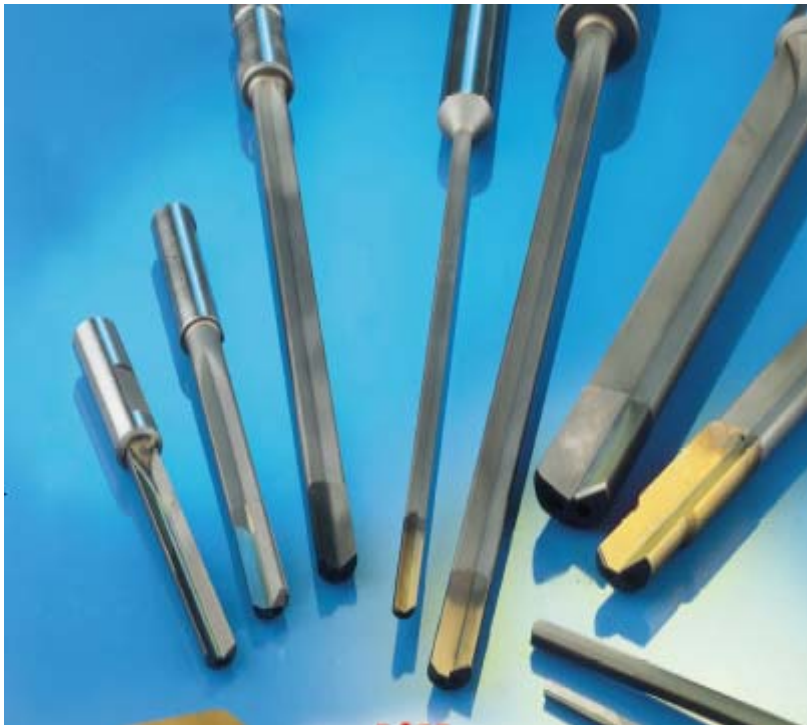
These tools have an eccentric tip and require a guidance during the machining.

The feed is continuous (no peck feed).

The high pressure coolant arrives by the center of the tool and driven chips toward the outside, canalized by the longitudinal groove in V.



Deep Hole Drilling : For whom? For what?



The deep drilling process with tools $\frac{3}{4}$ was developed for the manufacturing of firearms.

With the performances 10 times superior to the usual helical drill , this process is also named : "Drilling of precision"

Examples of deep drillings:



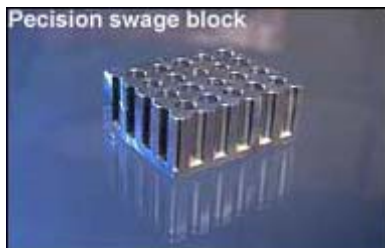
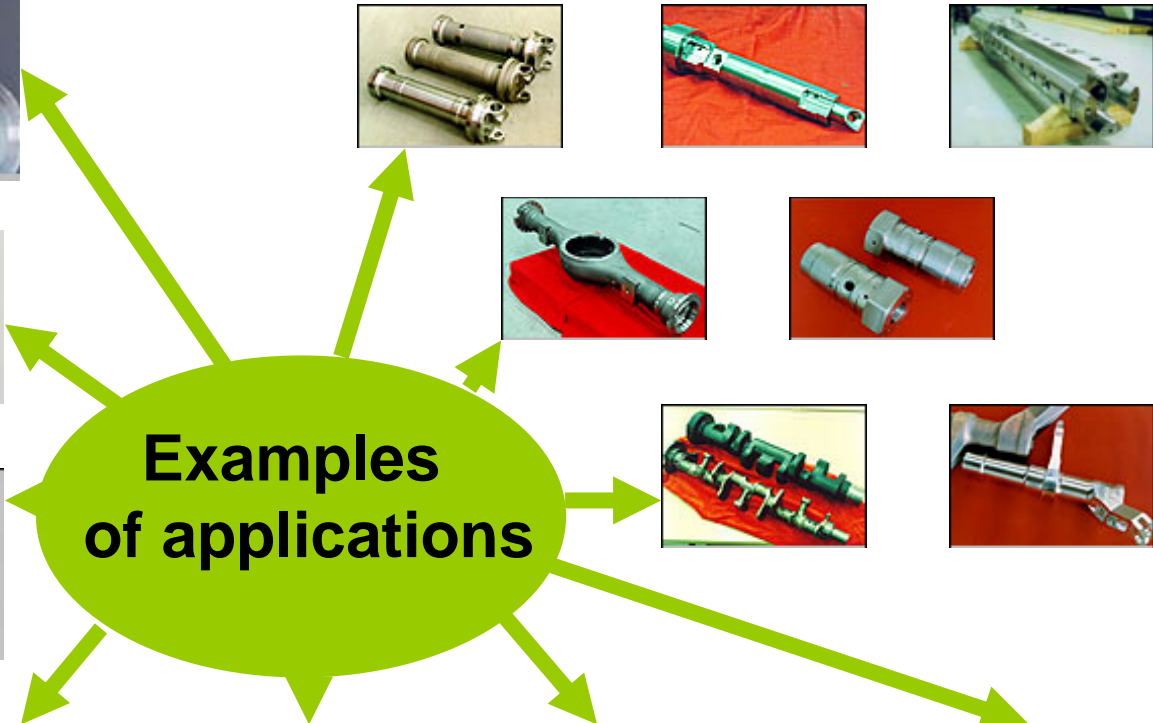
Transformation of plastic materials



Hydraulic pieces & air



Axes and rollers for printing



Molds & toolings



Medical prostheses and surgical tools

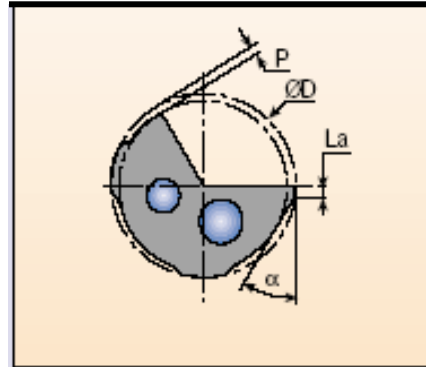


Automotive and aeronautic pieces

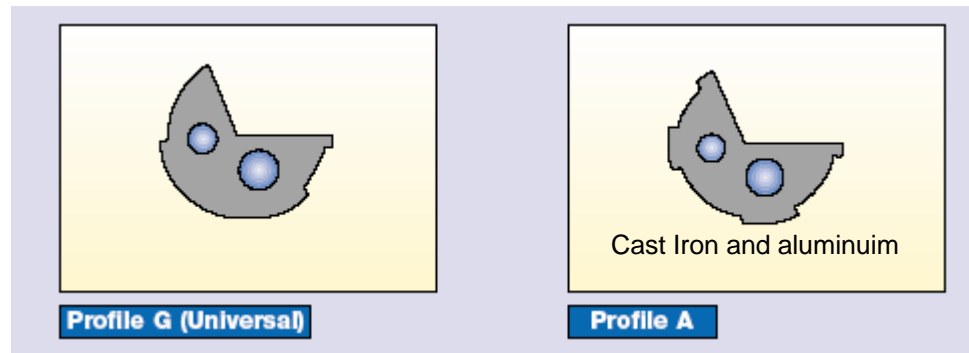


Pieces for gas

Standards profiles of heads:

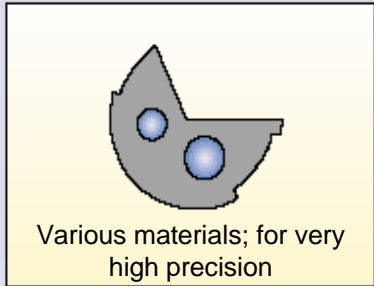
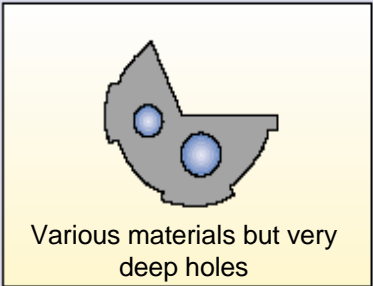
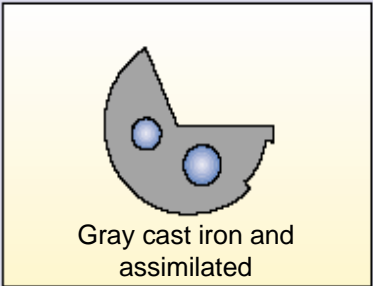
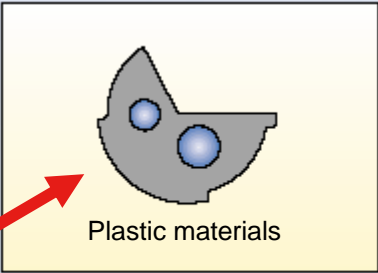
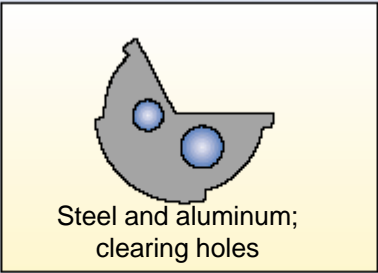
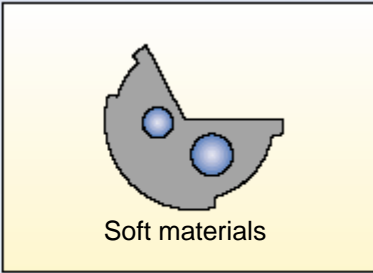


The P , La and α values are variable according to material to manufacture



Standards profiles of heads:



 <p>Various materials; for very high precision</p> <p>Profile B</p>	 <p>Various materials but very deep holes</p> <p>Profile C</p>	 <p>Gray cast iron and assimilated</p> <p>Profile D</p>
 <p>Plastic materials</p> <p>Profile E</p>	 <p>Steel and aluminum; clearing holes</p> <p>Profile H</p>	 <p>Soft materials</p> <p>Profile I</p>

Note :

According to materials, the sectors in contact with the boring are not the same, in order to limit the friction of the tool.

They form a sliding block.

Most heads are sometimes coated. (TIAN; TICN; TIN;)



Methods of deep drilling:



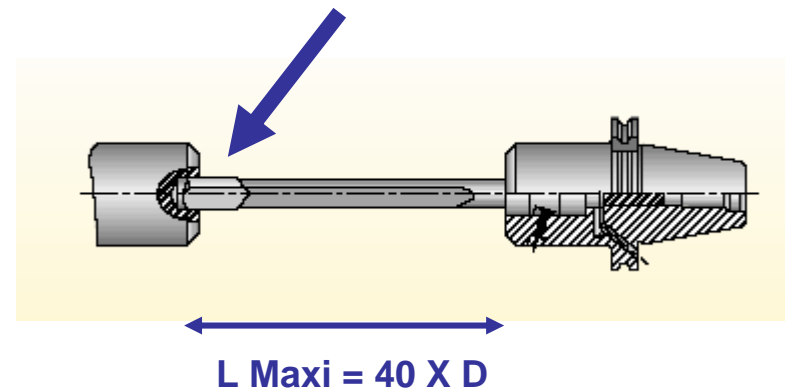
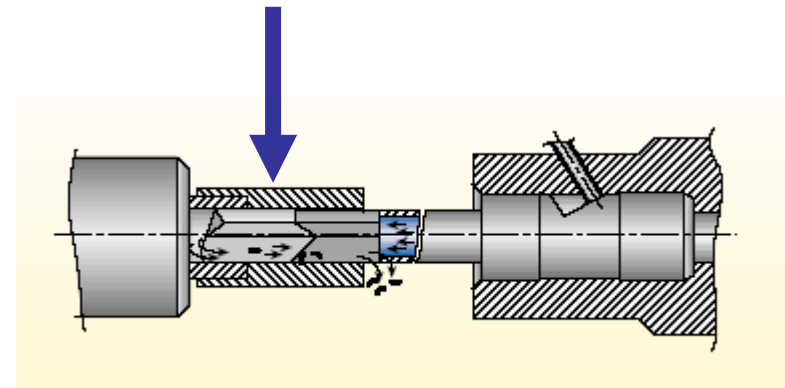
The drill 3/4 is not a tool "auto centering", it needs a guide to respect the point of entry of the piece.

Two cases:

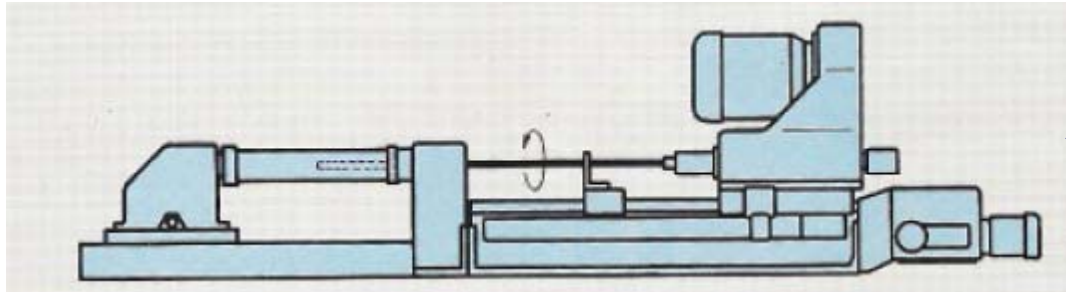
- Use of a guide bushing to the level of the hole to drill.

It is the case for the machines of deep drilling using some units for example.

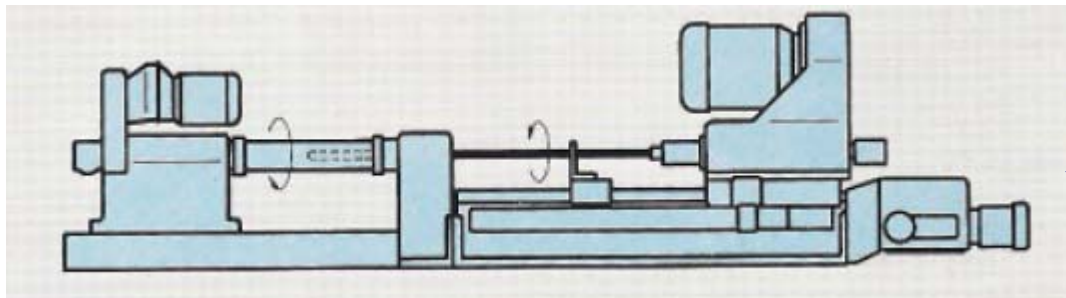
- Presence of one pre-started hole with a depth of 1,5 to 2 times the diameter. It is the case of the machining Centers. The tool being "in air", its deflection due to the gravity, limits its length between 35 and 40 times its diameter. A reversed rotation will be better (about 60 Rpm and 1mm/tour feed).



The rotations:

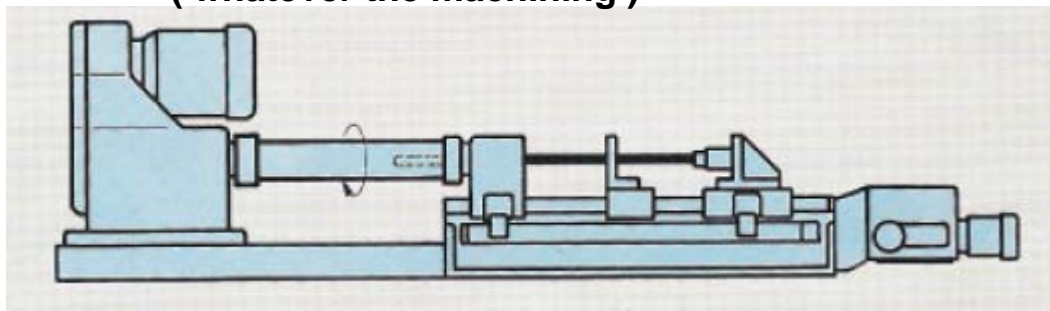


Tool 3/4 in rotation
Stationary working piece



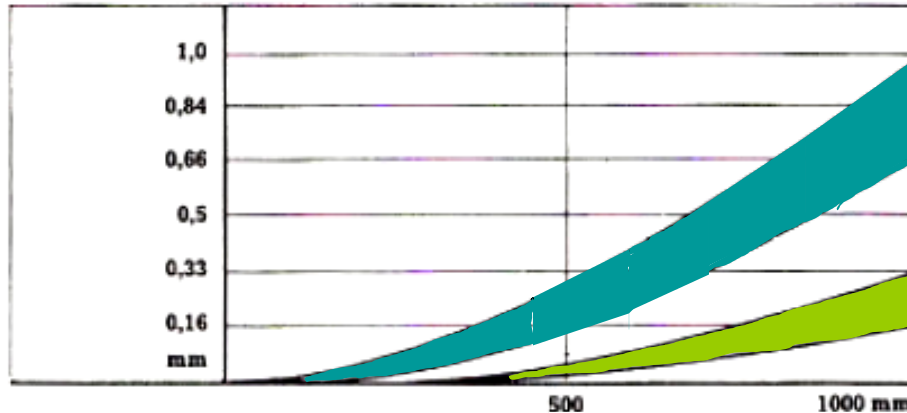
Tool 3/4 in rotation
Working piece reversed rotation

**NOTA : The reversed rotation of the piece is the order of 100 in 200 Rpm.
(whatever the machining)**



Stationary tool $\frac{3}{4}$.
Working piece in rotation

Deviation and rectitude:



Values of deviation depth of the boring

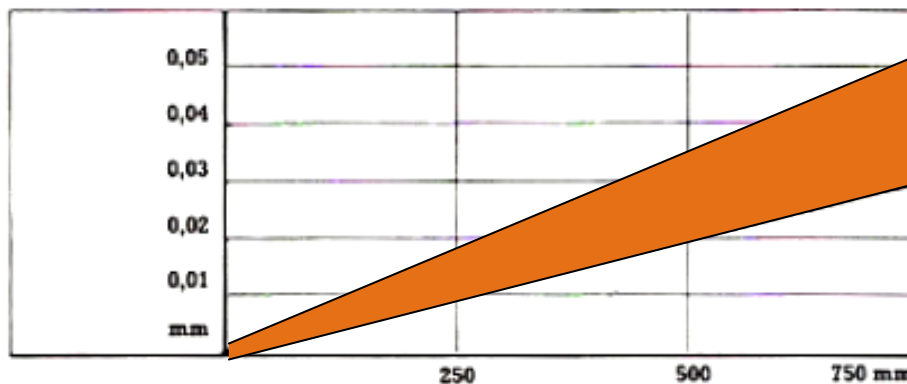


Deviation and rectitude:



Tool 3/4 in rotation

Working piece reversed rotation

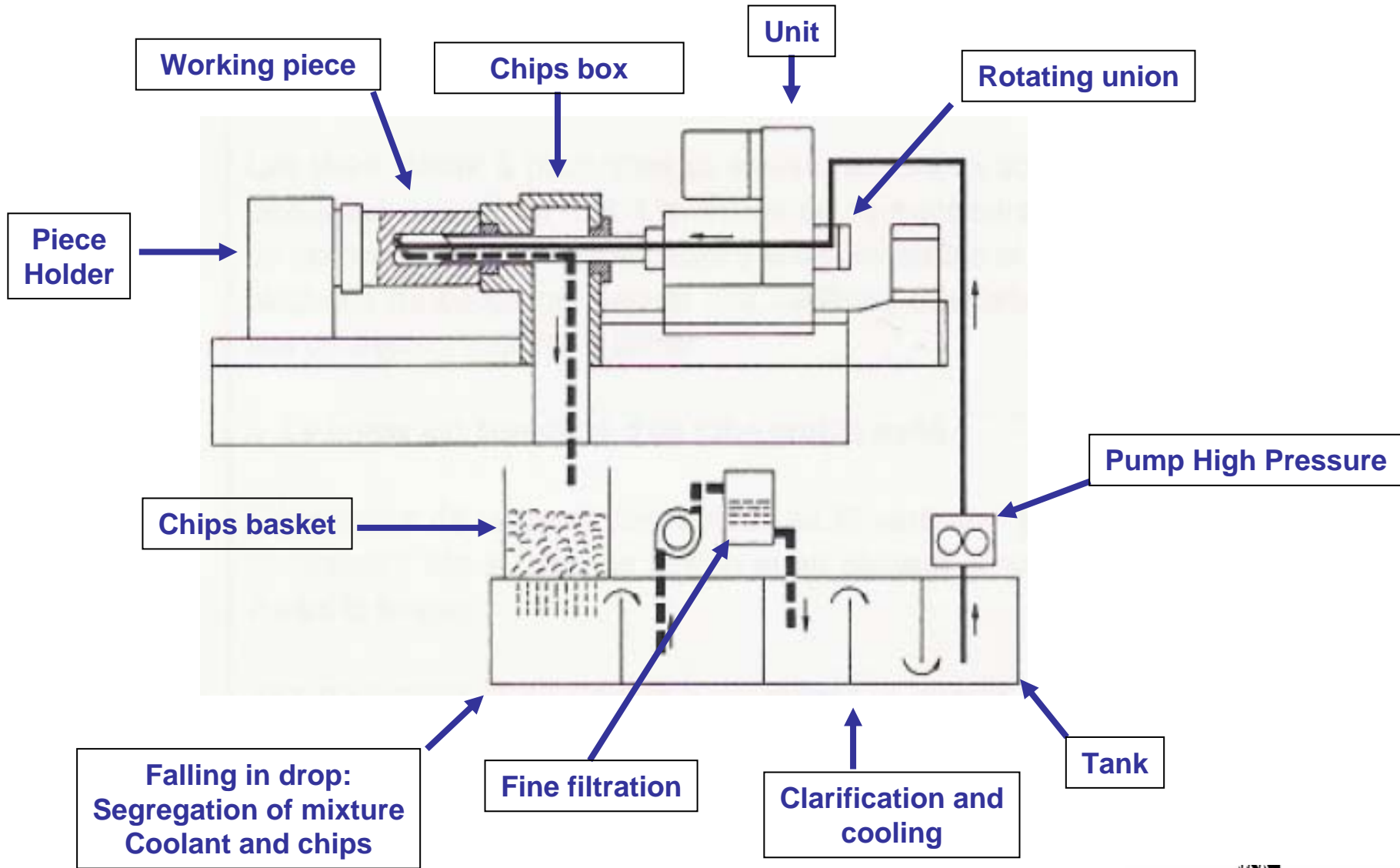


Realizable rectitudes Depth of the boring

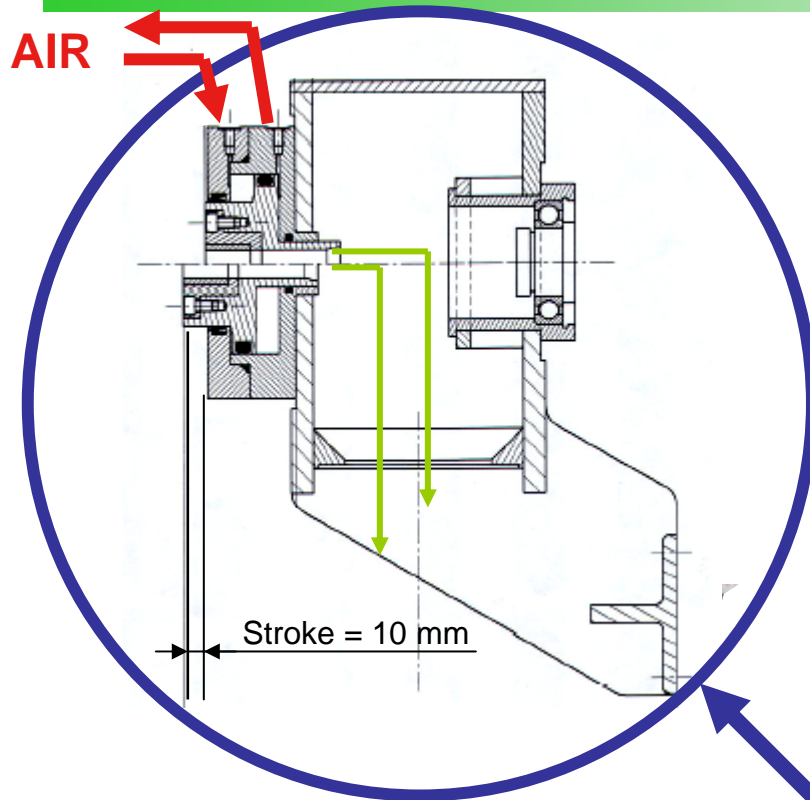
The reversed rotation of the piece permits to divide by two the value of deviation of the drill 3/4.

It is however the solution the less used because of the shapes and measurements of the pieces

Coolant system of a deep drilling machine:



Chips box of ECPP4 :



Two versions are available:

- With stationary cannon
- With mobile cannon (see picture)

The mobile cannon is moved pneumatically and exercise a pressure of contact on the working piece of about 10 Kg.

The fact to be in contact against the piece allows chips and lubricant to be canalized, via chips box, toward their treatments and recuperations.



Operating method to change the tool:

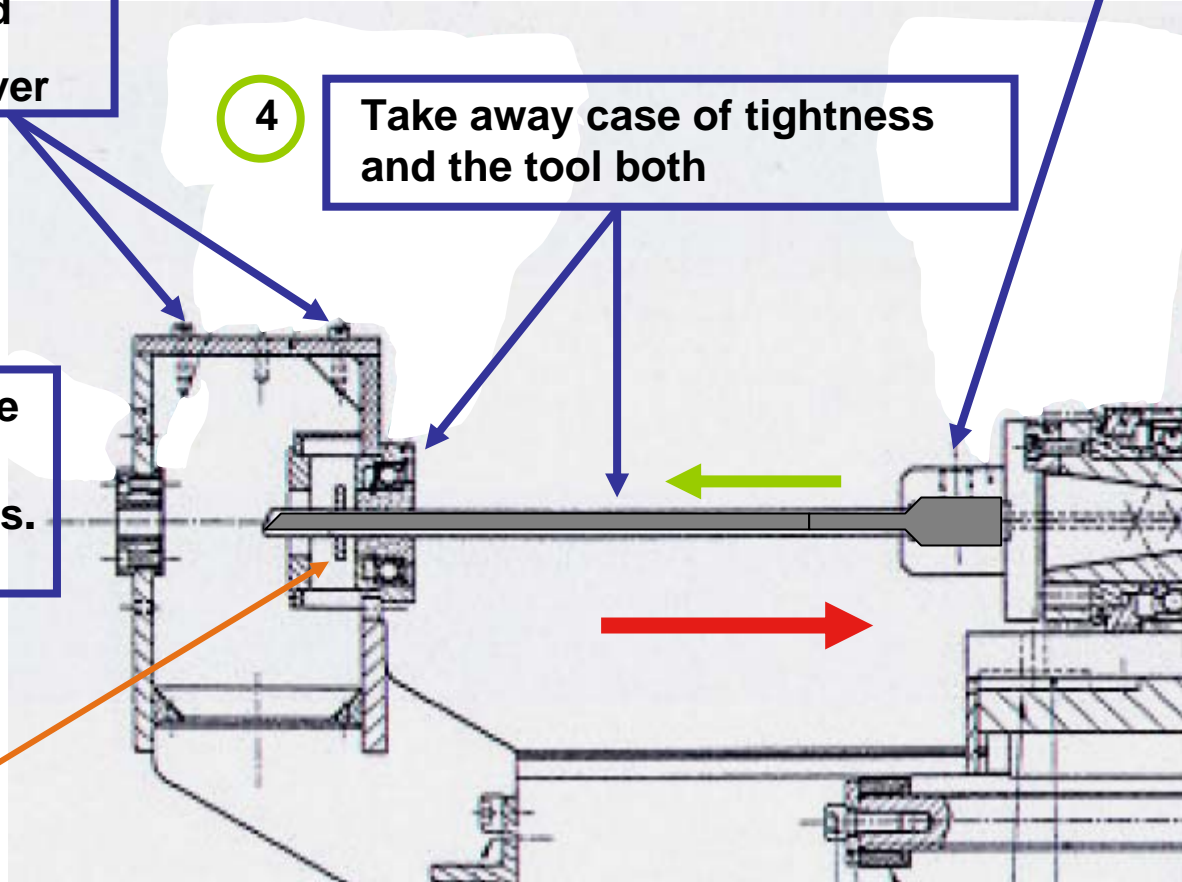
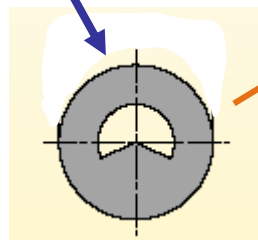


- 1 The spindle unit must be in the complete rear position
- 3 Unscrew the tool of the tool holder and move it (about 45mm)

- 2 Unscrew the screws and remove the superior cover

- 4 Take away case of tightness and the tool both

- 5 Outside, take the tool out of the case. Remove the seal from tightness.

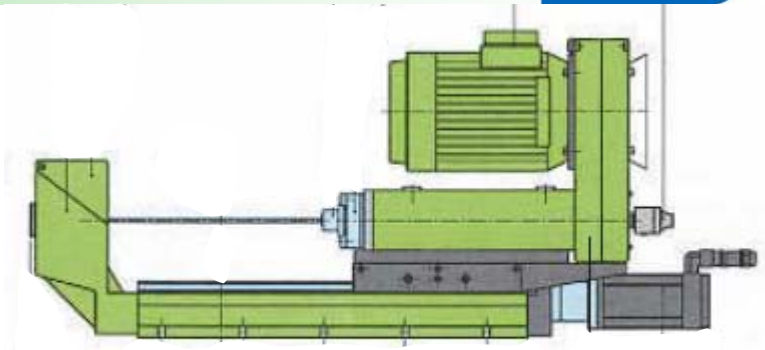


The ECPP 4 : yesterday, today and of tomorrow:



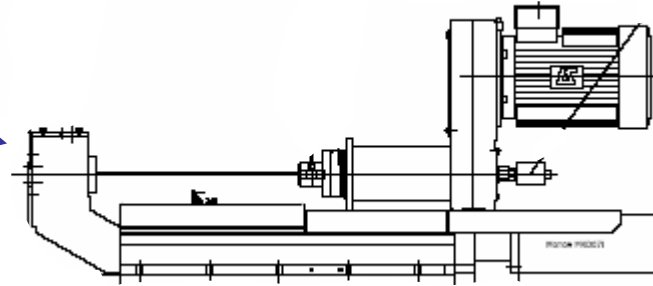
Old Generation: ECPP 4

Spindle unit MAX 4 on UA 3 CN bases (160 or 320) with special wagon
== > stroke 200 or 360 mm



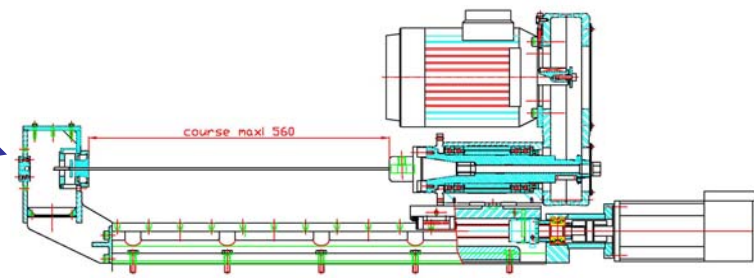
Now : ECPP 4 EVO. 1“

Spindle MAX 30 B - ISO40 - S on UA3 CN bases (160 or 320) or on UA basis 3 SP mechanic welded
== > Standard stroke 200 / 360 mm and until 500mm maxi in SP.



Future: ECPP 4 EVO. 2“

Spindle MAX 30 B ISO 40-S on future generation of UA 3 CN
== > Stroke until 560mm with Std basis



NOTE : The stroke is not the depth of drilling

Questions ?



Notes :

A complete exposition on the deep drilling will be given you on a format CD Rom.

Many thanks to :

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Thanks for your attention.