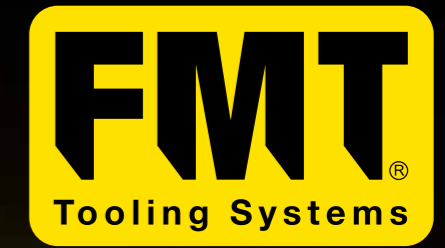


cmc



MKFMT0.031A - 05/2014

# Big challenges, Great solutions!

**TOOLS FOR CAST IRON MACHINING**



[www.fmttooling.com](http://www.fmttooling.com)

**FREZITE** Group

# FREZITE, A HISTORY OF SOUNDNESS AND INNOVATION



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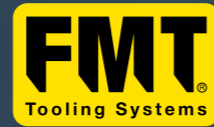
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Working for the highly competitive professional and industrial segments, Frezite has achieved its growth in sound, sustainable fashion since its foundation in 1978. The company started its activity with the production of high-precision tools for the wood, plastics, composite materials and metals transformation industries and sectors.

The opportunities generated by the surge of the automobile and aerospace sectors have led to the automation of the Metal Division and the creation of the **FMT – Tooling Systems brand**. With head offices based in Portugal and strongly geared towards internationalisation, the Frezite Group already has a consolidated branch network. Developing engineering solutions for different markets, Frezite has been extending its field of action to new operating areas.

**FREZITE** Group





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CZECH REP.



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SPAIN

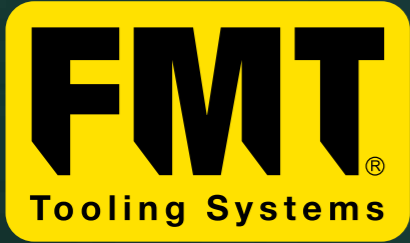


ROMANIA



4 **GLOBALLY WELL POSITIONED**

**FREZITE** Group 5



***A touch of innovation based***

***on experience***

# MISSION

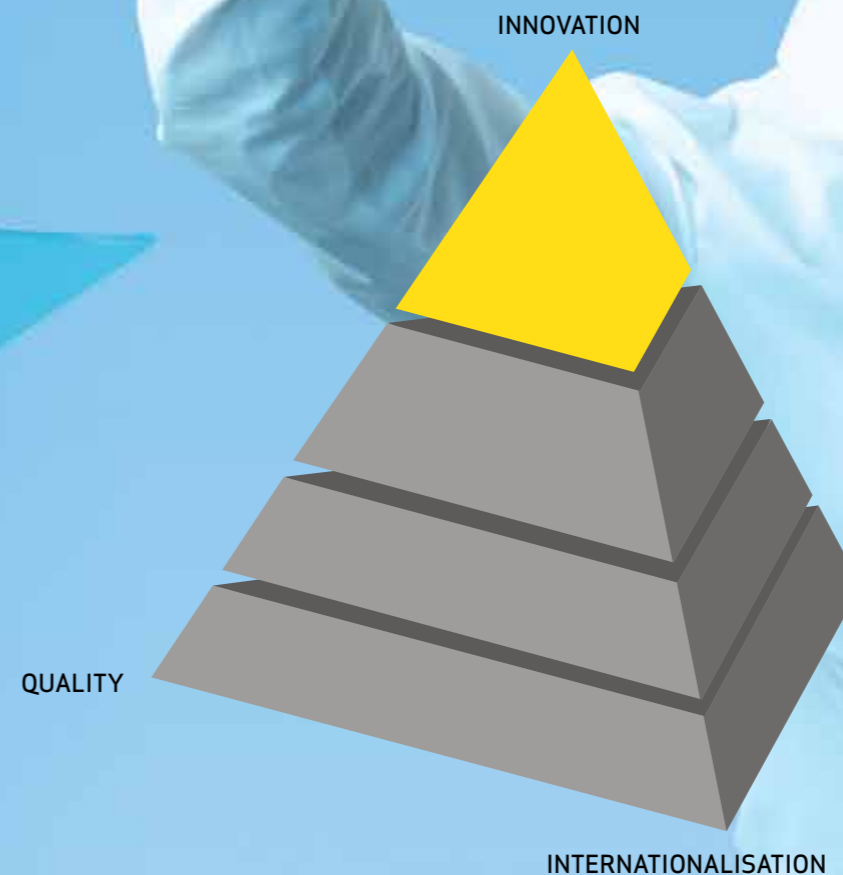
“TO BE AN ORGANIZATION  
RECOGNIZED FOR ITS  
EFFICIENCY IN MAINTAINING  
AND CREATING VALUE.”

# VISION

“TECHNOLOGY DEVELOPMENT  
FOR SUSTAINABLE  
IMPROVEMENT OF  
QUALITY OF LIFE.”

# VALUES

“INTEGRITY, TEAM SPIRIT AND INNOVATION.”



**FREZITE** Group

# INDUSTRIES/MARKETS



**AUTOMOBILE**

**AERONAUTICS**

**ELECTRONIC**

**MEDICAL**

**MOULDING**

**VALVES**

**FREZITE** Group



# PHILOSOPHY



Continued investment in the latest machinery technologies

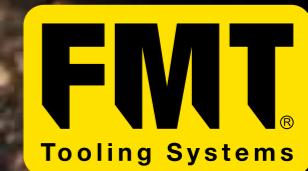
Local support and service for all product

Commitment to research and development

Investment in expertise to support Key User Partnerships

**FREZITE** Group





# RESEARCH & DEVELOPMENT (CENTRE)

**Internal test centre for new cutting tool designs.**

**Setting up of machining demonstrations for customers.**

**Troubleshooting of machining problems.**

**Development of new machining processes and internal knowledge.**

# The Power of Engineering



FMT 7 Advantages

**Ideal Partners**

**Easy to Work With**

**Dynamic Team**



**Enlarged  
portfolio**

**Research  
& Development**

**Focus  
on Performance**

**Global  
Presence**



Backed up by the great experience of its engineers in designing high-quality cutting tools – in standard products and customized solutions – Frezite's Metal Division has become more independent and now works with the FMT – Tooling Systems brand.

Geared up for any challenge, FMT adopts state-of-the-art working concepts, producing innovative tooling systems developed in line with the requirements of each customer.

The company has a Research and Development Centre at which it tests better adjusted solutions to ensure the best performance and returns.

Particularly geared towards meet the needs of the following industries: Automobile, Aeronautics, Moulds, Medical (Instrumental), Electronics, Equipment etc., the FMT brand offers the markets 7 advantages which set it apart.



**Your goals are our goals!**

**Feeling our customers challenges  
that is part of the solution.**

**Impossible is not listed  
on our glossary.**

**“WE ARE PART OF OUR  
CUSTOMERS TEAM.”**

**“WE KNOW HOW TO LISTEN  
OUR CUSTOMERS.”**

We have expertise to understand your challenges and goals, together we will develop the best solution.

**“ALWAYS LOOKING FOR  
THE RIGHT SOLUTION.”**

---

**Flexibility and innovation**

---

**Enlarged portfolio**

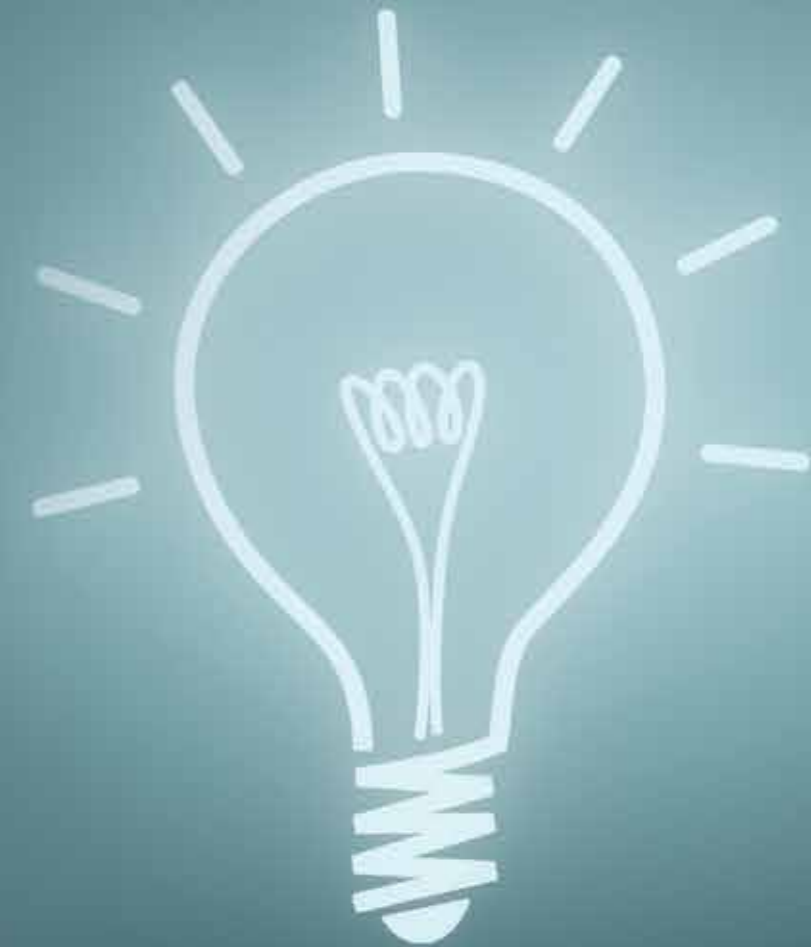
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**The best quality**

---

**The best cost effectiveness**

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**“WE WANT TO BE THE BEST,  
NOT THE BIGGEST.”**

Proximity, efficiency and a speed response are advantages which make working **with us unique and easy.**



#### Our commitment, delivery and products

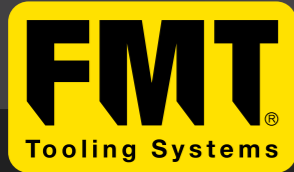
- ✓ Solid carbide – 3 to 4 weeks
- ✓ Braze carbide – 4 to 5 weeks
- ✓ Indexable tooling – 4 to 5 weeks
- ✓ PCD milling cutter – 4 to 5 weeks
- ✓ PCD drills – 4 to 5 weeks
- ✓ Fine boring tools – 6 weeks
- ✓ Modular systems – 6 weeks
- ✓ Inserts – 4 weeks
- ✓ Service – 3 weeks
- ✓ Follow up order, less one week



#### Special service

- ✓ Offers in 48 hours max
- ✓ Local technical support in 24 hours
- ✓ Special delivery from 2 to 10 working days
- ✓ Project offers in 2 weeks max





# TOOLS FOR CAST IRON MACHINING

The following tools use mainly hard metal ISO inserts which is simplest way to machine ferrous materials. Specific cutting forces can be reduced using positive cutting angles which ease machining, this is important when several profiles are being machined simultaneously which increases the requested spindle power.

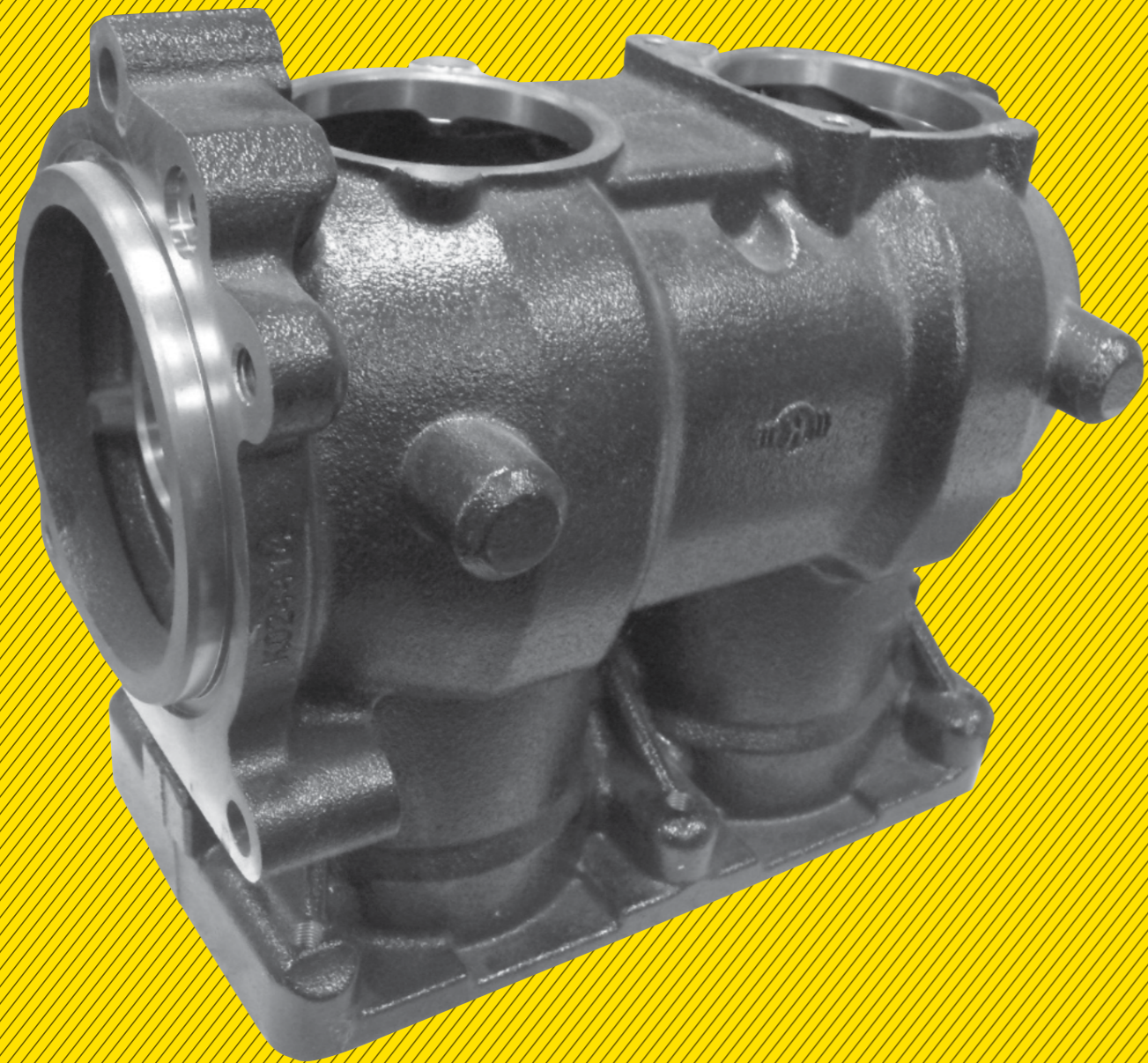
PCBN on the other hand will provide longer tool life, combined with an increase in production due to a higher cutting speeds and higher feed rates.

PCBN is also capable of providing better surface finish and tighter tolerances, being in some applications a good alternative to grinding processes.

On this presentation we aim to provide some application examples for combined drilling applications, profile milling and reaming operations.

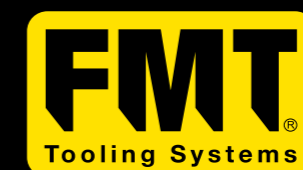






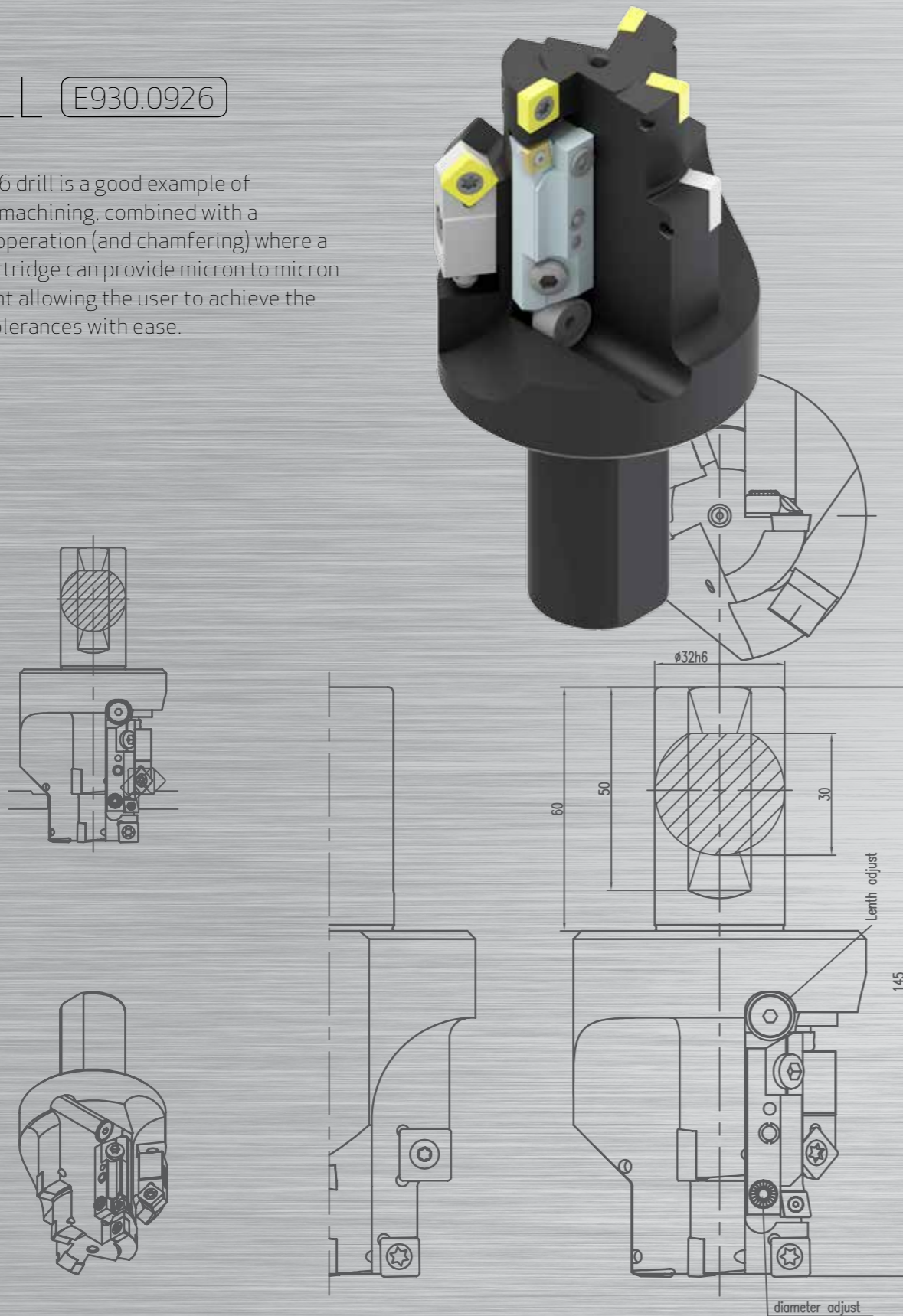
# COMPRESSOR HOUSING

MATERIAL: CAST IRON



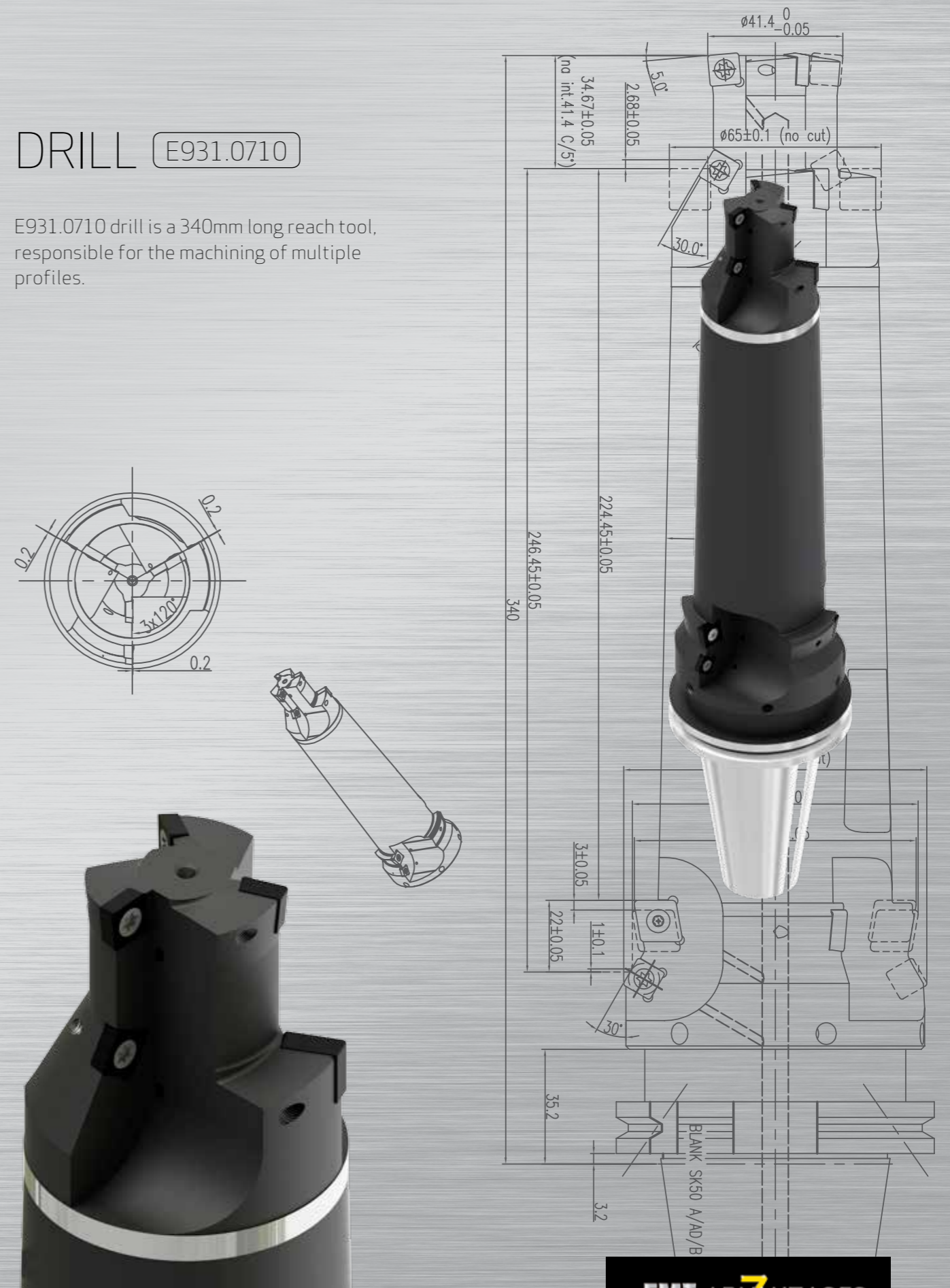
## DRILL E930.0926

E930.0926 drill is a good example of precision machining, combined with a roughing operation (and chamfering) where a simple cartridge can provide micron to micron adjustment allowing the user to achieve the desired tolerances with ease.



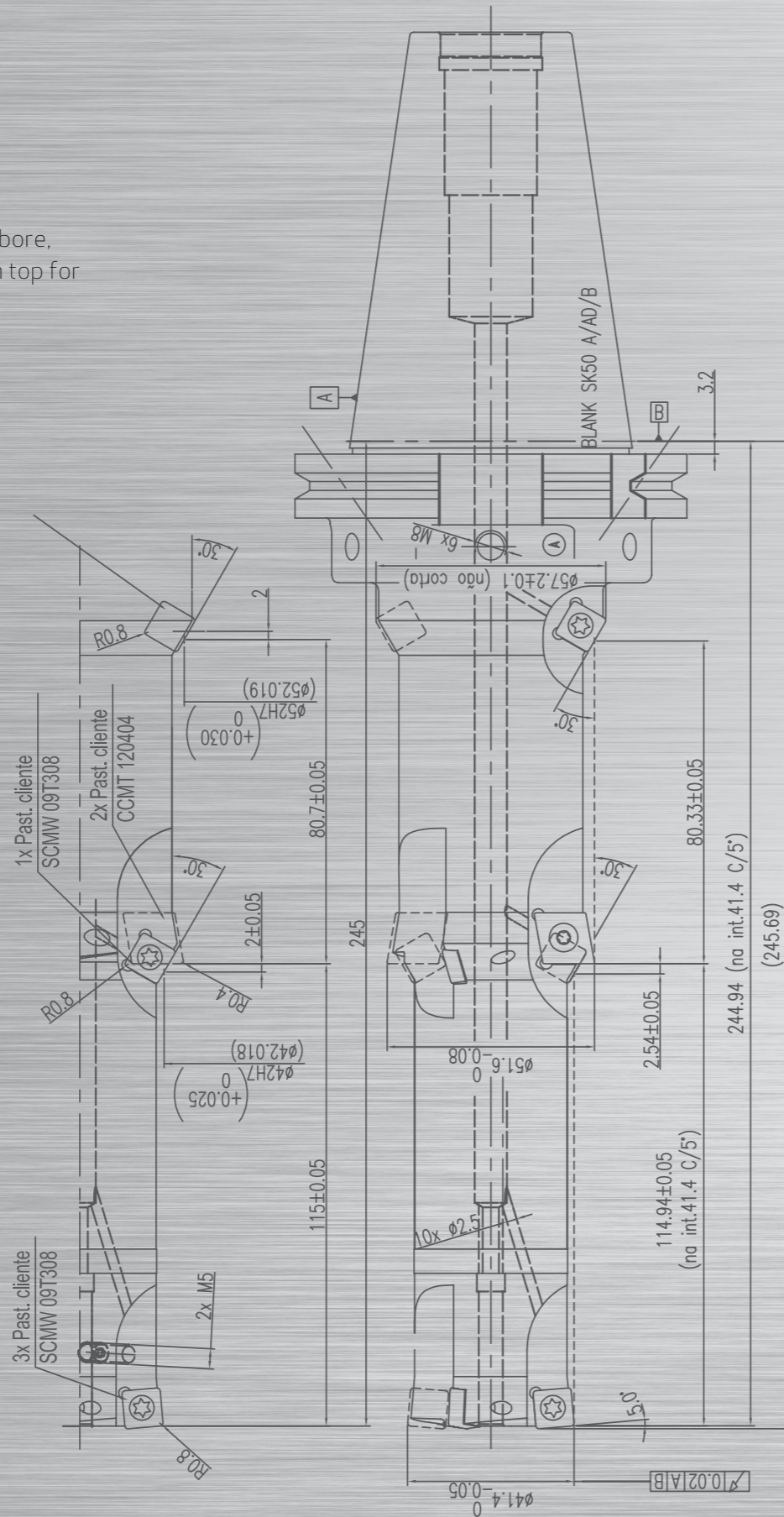
## DRILL E931.0710

E931.0710 drill is a 340mm long reach tool, responsible for the machining of multiple profiles.



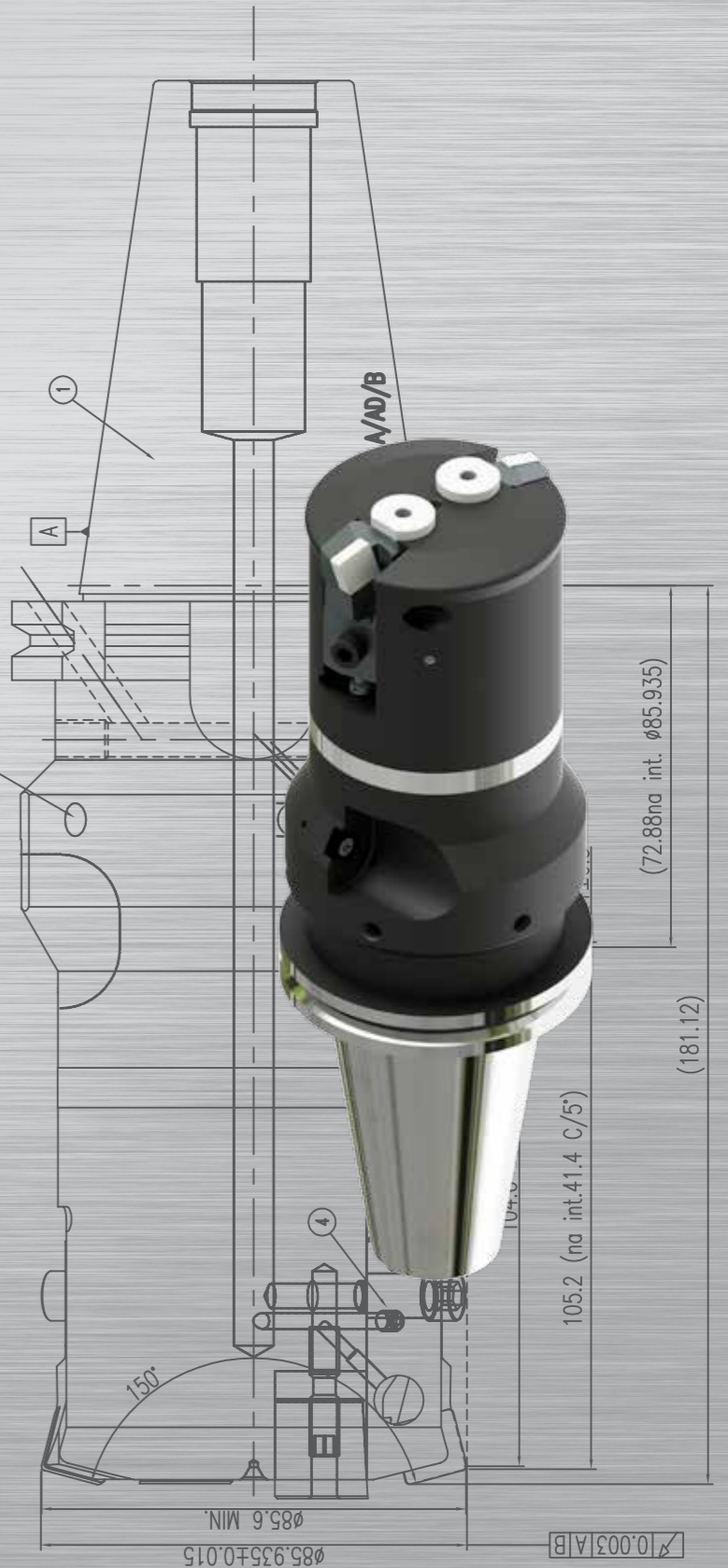
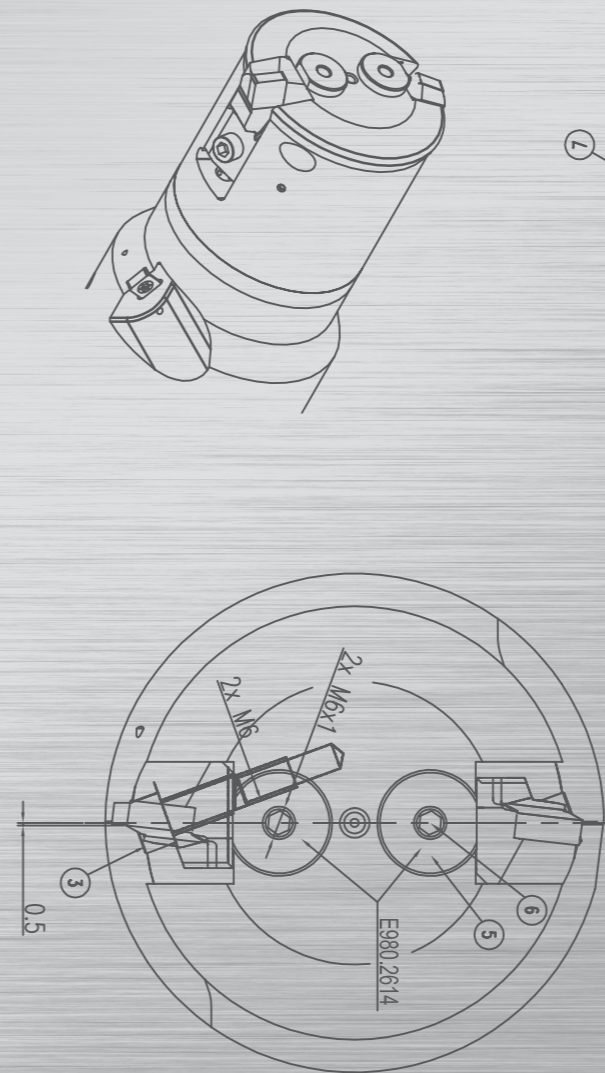
## DRILL E931.0712

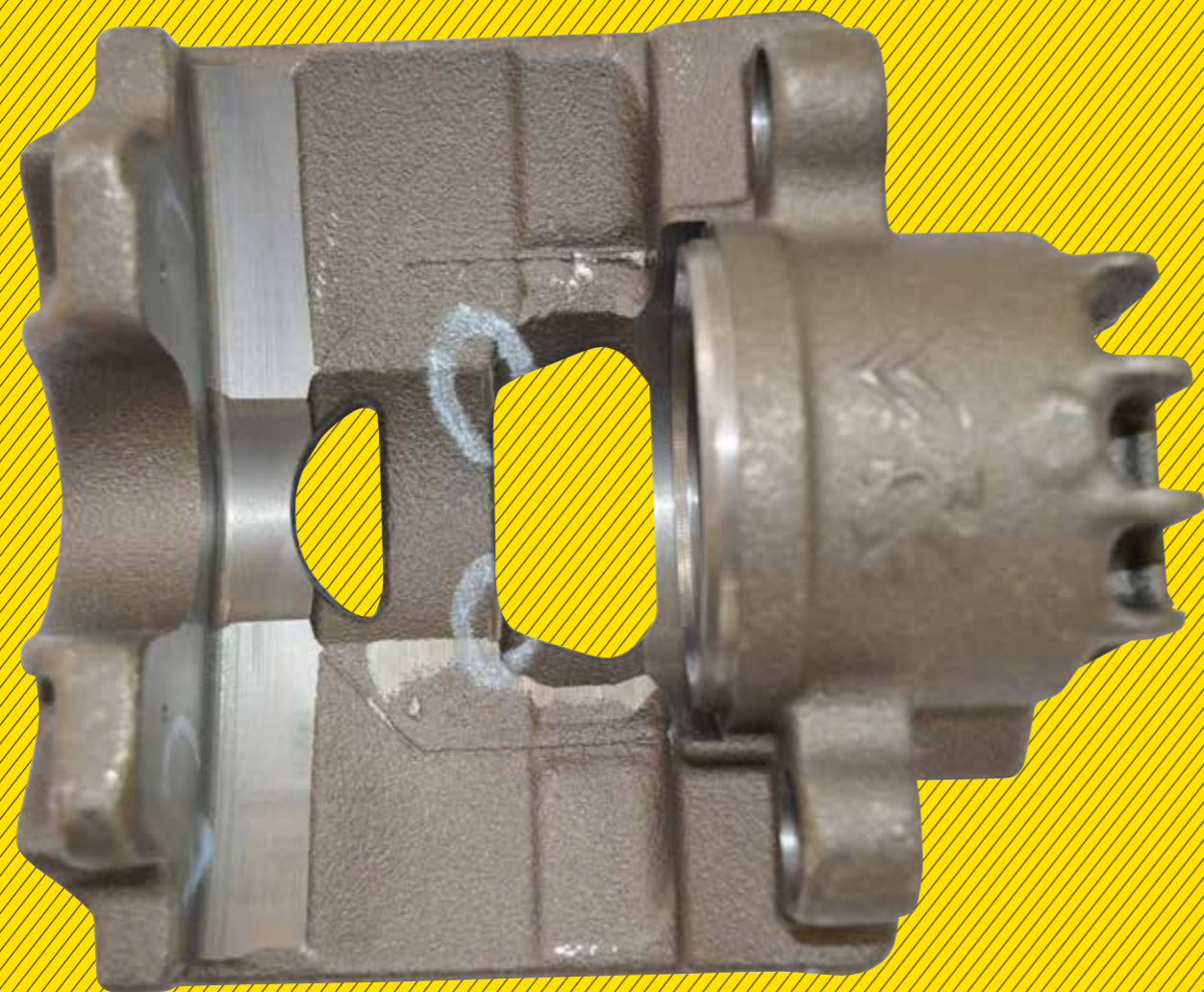
E931.0712 drill is designed for a long bore, while combining a hard-metal drill on top for a secondary operation.



## DRILL E931.0817

E931.0817 is another example of high precision with simplicity, using radially adjustable cartridges.





# BRAKE CALLIPER

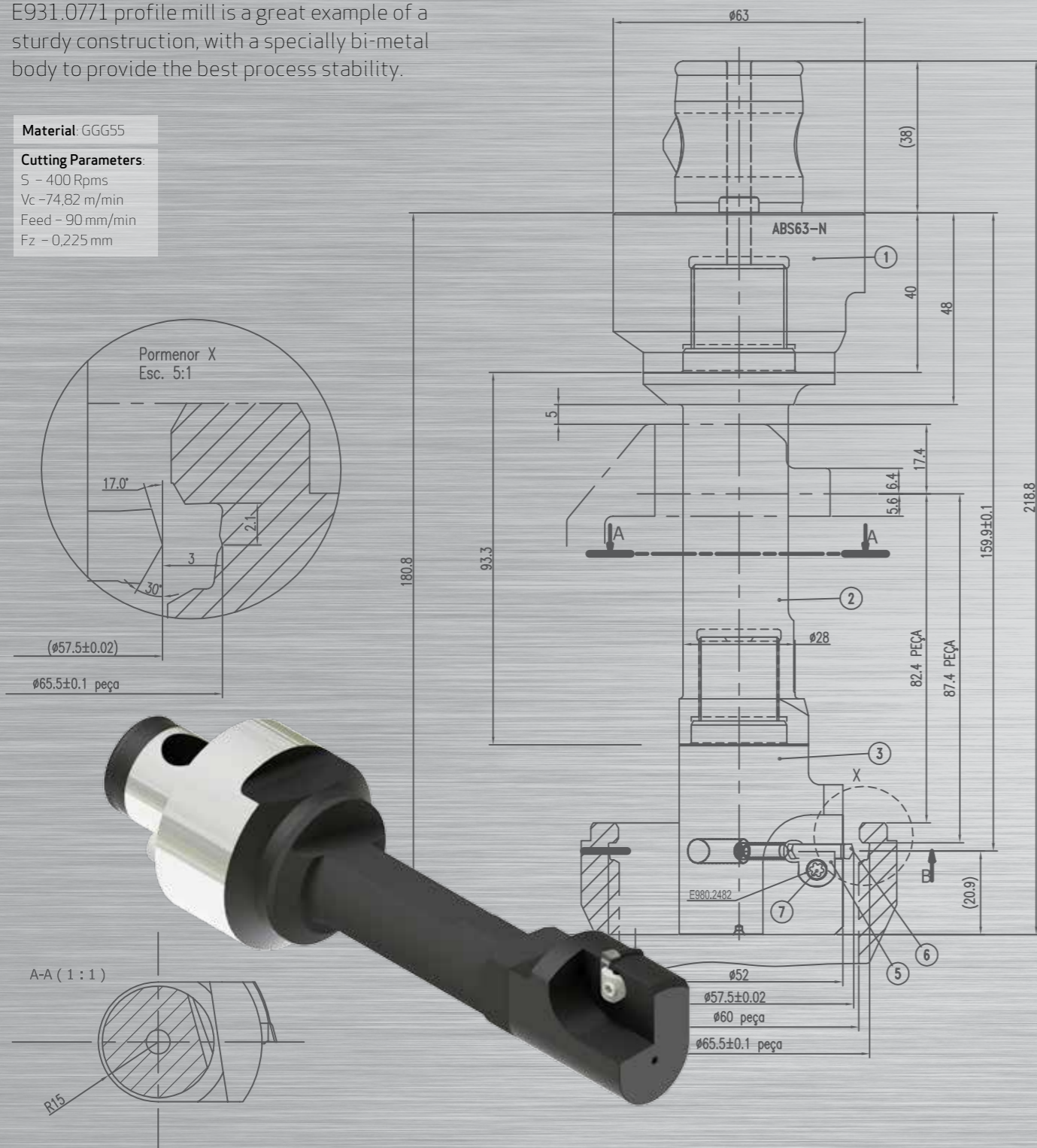
MATERIAL: CAST IRON  
GGG55



## MILL E931.0771

E931.0771 profile mill is a great example of a sturdy construction, with a specially bi-metal body to provide the best process stability.

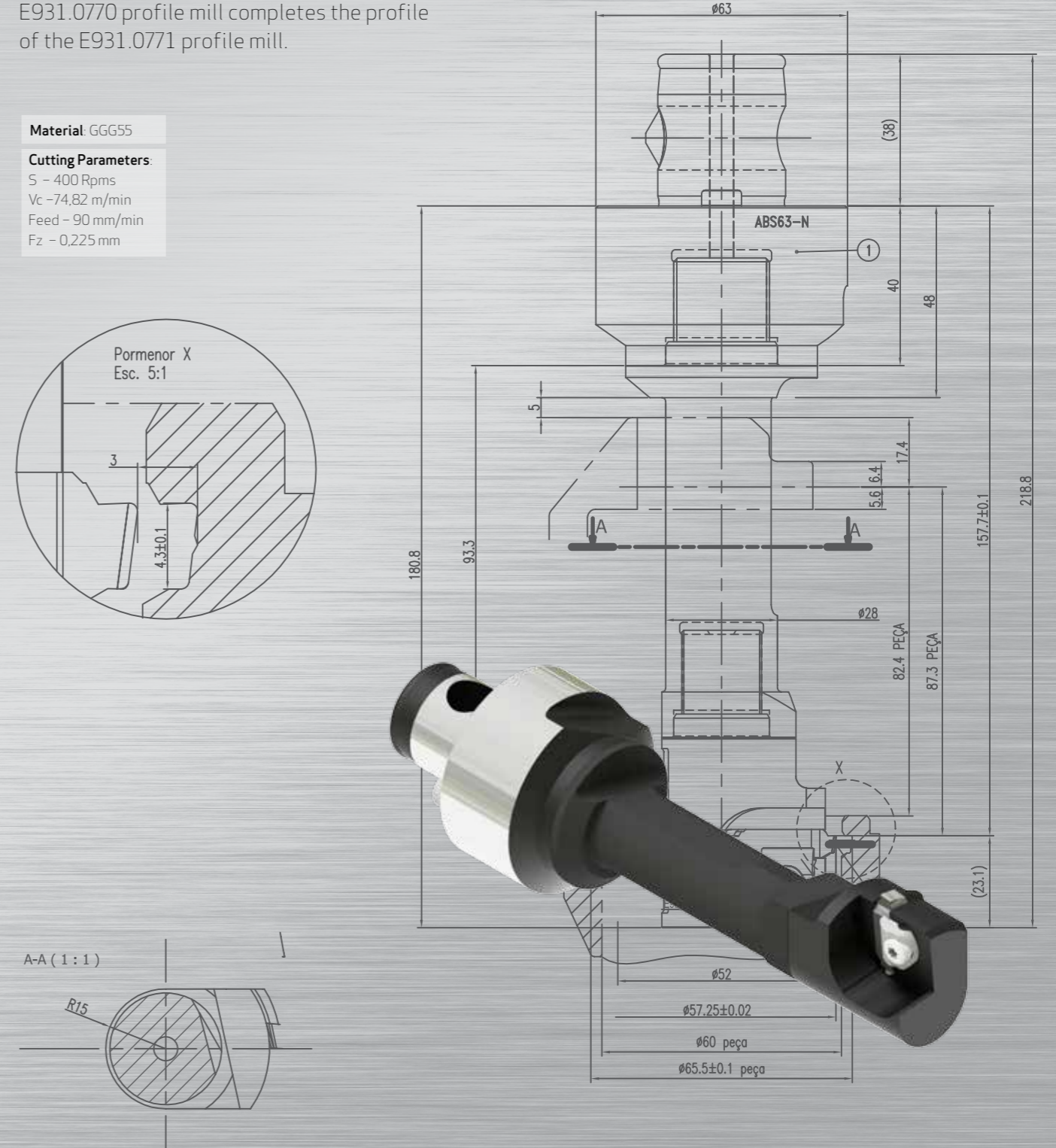
**Material:** GGG55  
**Cutting Parameters:**  
 S - 400 Rpm  
 Vc - 74,82 m/min  
 Feed - 90 mm/min  
 Fz - 0,225 mm



## MILL E931.0770

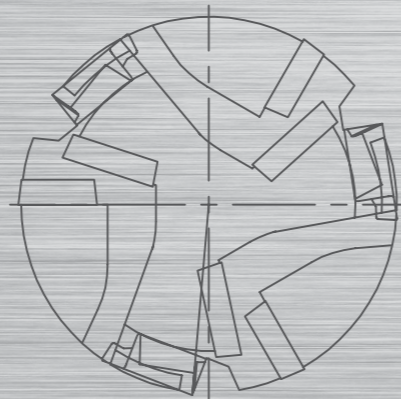
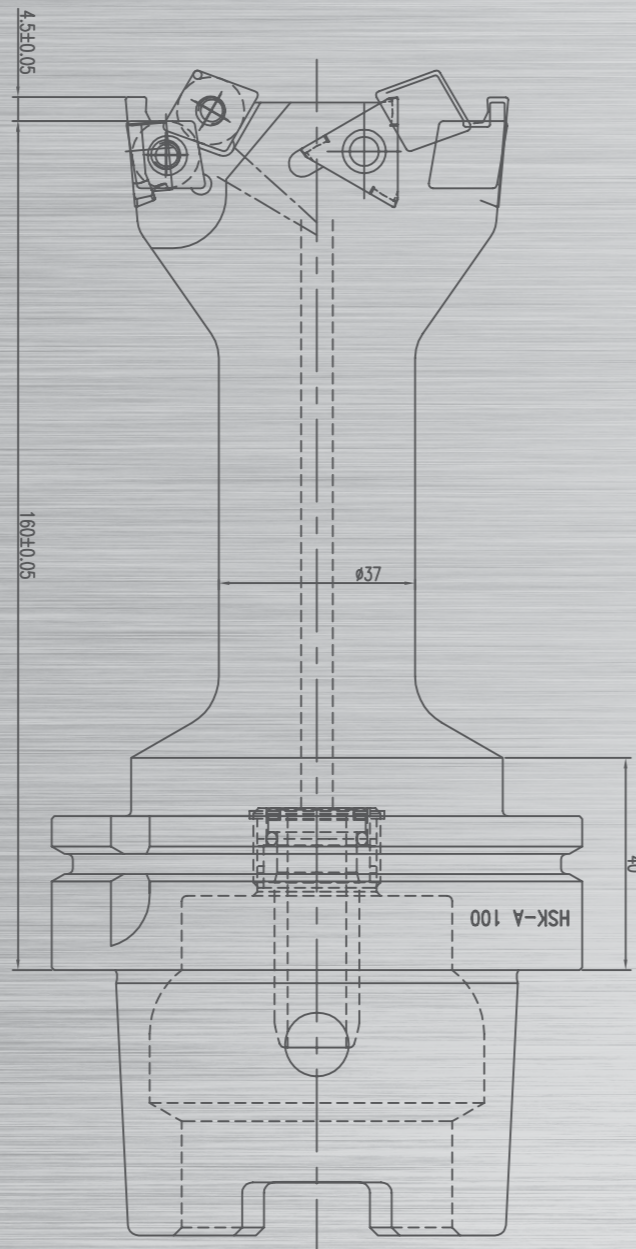
E931.0770 profile mill completes the profile of the E931.0771 profile mill.

**Material:** GGG55  
**Cutting Parameters:**  
 S - 400 Rpm  
 Vc - 74,82 m/min  
 Feed - 90 mm/min  
 Fz - 0,225 mm



## DRILL E931.0257

E931.0257 drill is capable of a high rate of material removal while machining several surfaces simultaneously



## REAMER E931.0229

The E931.0229 "One-Shot" drill is one of the most successful examples in this list due to its capability of reaming to H8 tolerance without previous operations.

**Machining Centre:** BA 400

**Material:** GGG 55

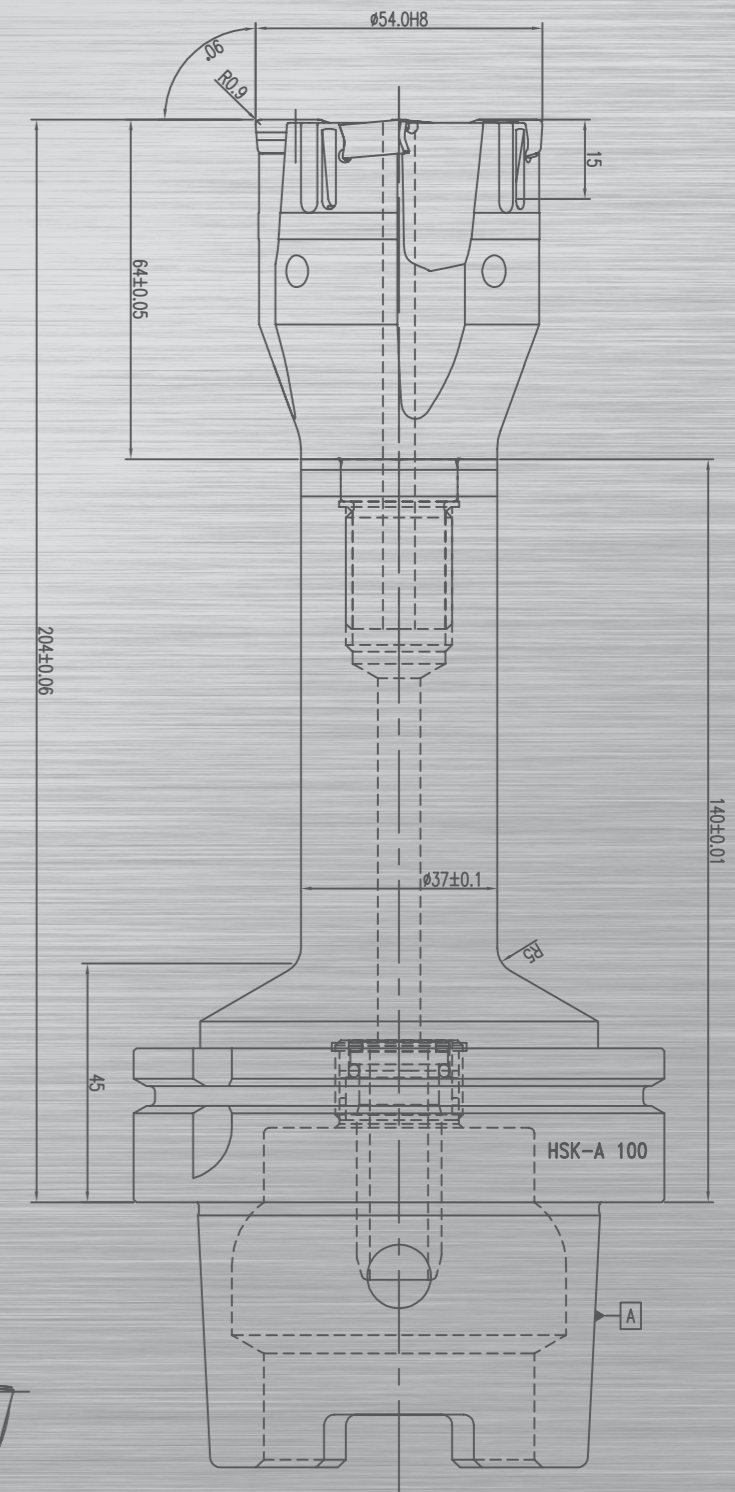
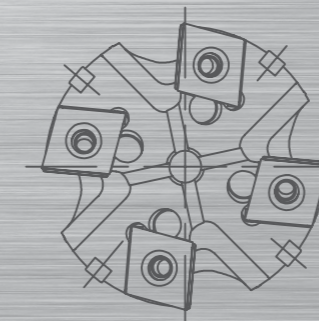
**Cutting Parameters:**

S - 900 Rpm

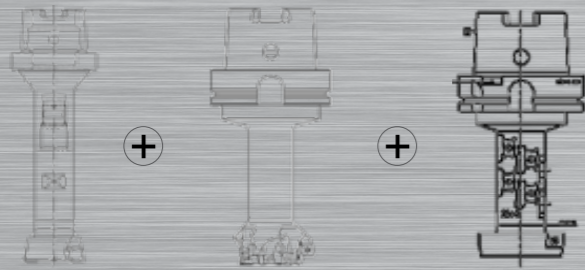
Vc - 153 m/min

Feed (initial) - 400 mm/min

Feed (end of bore) - 250 mm/min



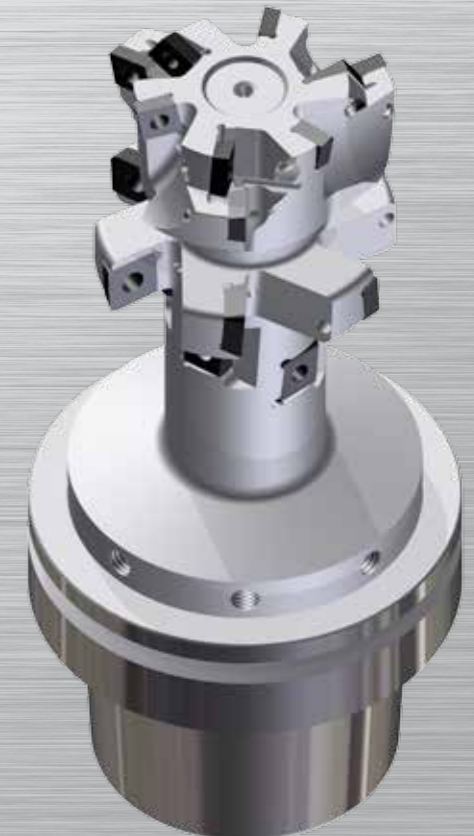
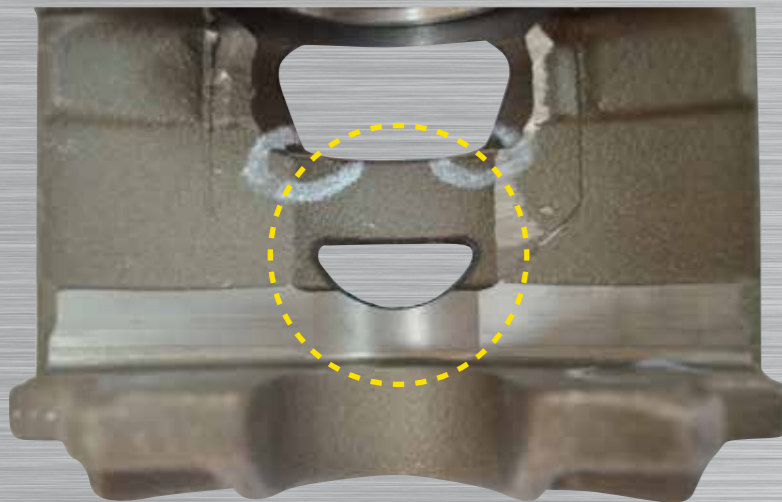
## TRIPLE TOOL COMBINATION



#	Tool	Time [min]
#1	Milling Cutter $\phi 71.7$	0.576
#2	Milling Cutter $\phi 72.05$	0.226
#3	Boring Cutter $\phi 53$	0.365

Tool	S [rpm]	F [mm/min]	F [mm/min]
E931.0128	650	160/300/390/780/150	0.753
E931.0138	500	250	0.203

### Machining Operations:



With the combination of tools the customer gain 5,6 seconds per part, which results in a significant reduction of the COST PER PIECE.



# HYDRAULIC OIL PUMPS

MATERIAL: CAST IRON  
GGG50





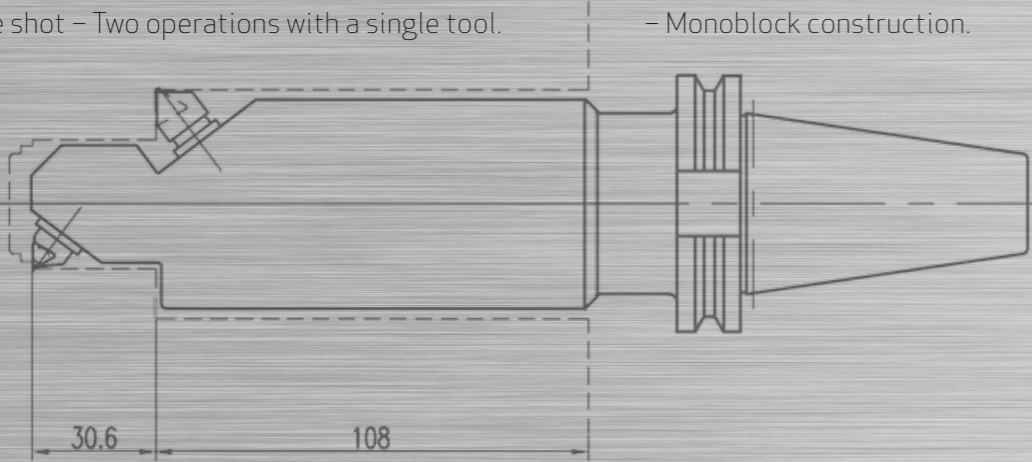
## FINE BORING PREVIOUS SOLUTION

### Machining advantages of FineBoring One Shot tool:

- › Dimensional precision
- › Quick adjustment system
- › One shot – Two operations with a single tool.

### Tool Components

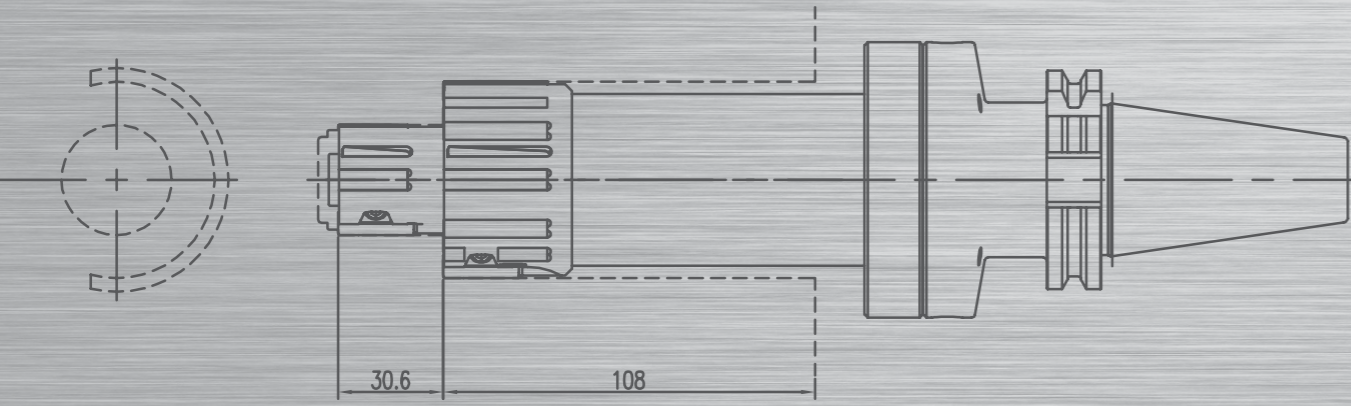
- Two microbores;
- Two hard metal ISO Inserts TCMT 090209 Cone SK40 (ISO40) DIN69871;
- Monoblock construction.



## FINE BORING TOOL E944.0112

The multiple step fine boring E944.0112 is an example of process stability in low support work piece designs. This challenge was met and overcome with a highly complex tool and high precision adjustment.

**Material:** GGG50  
**Cutting Parameters:**  
 S - 900 Rpms  
 Vc - 161 m/min  
 Feed - 135 mm/min  
 Fz - 0,15 mm

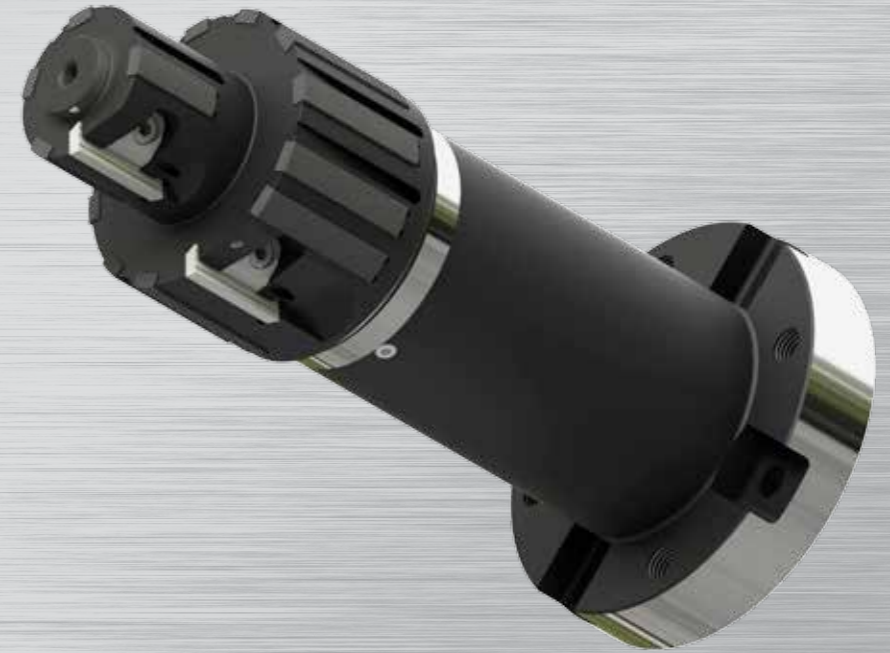
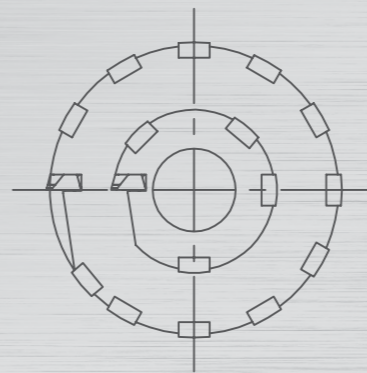


### Machining advantages of FineBoring One Shot tool:

- › Exceptional dimensional precision
- › Excellent concentricity
- › One shot – Two operations with a single tool
- › High quality surface finish
- › High production output

### Tool Components

- Tapper SK40
- 11 Cermet Guide pads ø57
- 4 Cermet Guide pads ø32
- 1 Blade on ø57
- 1 Blade on ø32
- Two component drill allowing for run-out adjustment



	Times Savings (per part machined)	
	Tool change	Machining cycle time (2 boring operations)
Client's previous solution	16 secs (2 tool changes)	2 tools = 1 min and 30 secs
<b>One Shot</b>	<b>8 secs (1 tool change)</b>	<b>1 tool = 50 secs</b>

	Financial savings in cycle time reduction		
	16 hours	22 workdays	222 workdays
Client's previous solution	240 €	5.280 €	53.280 €
<b>One Shot</b>	<b>225 €</b>	<b>4.950 €</b>	<b>49.950 €</b>

Machine plus machinists cost per hour = 15 €

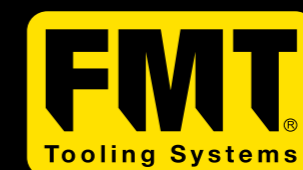
- ADVANTAGES**

  - LESS TOOL CHANGES**
  - LESS SET UPS**
  - LONGER TOOL LIFE**
  - MAGAZINE TOOL SPACE REDUCED**
  - CYCLE TIME REDUCED**

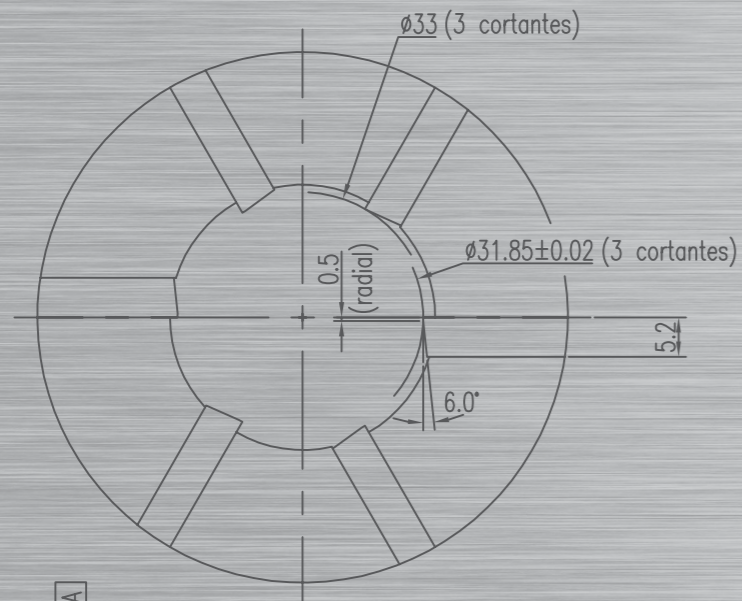


# BRAKE WHEEL CYLINDER

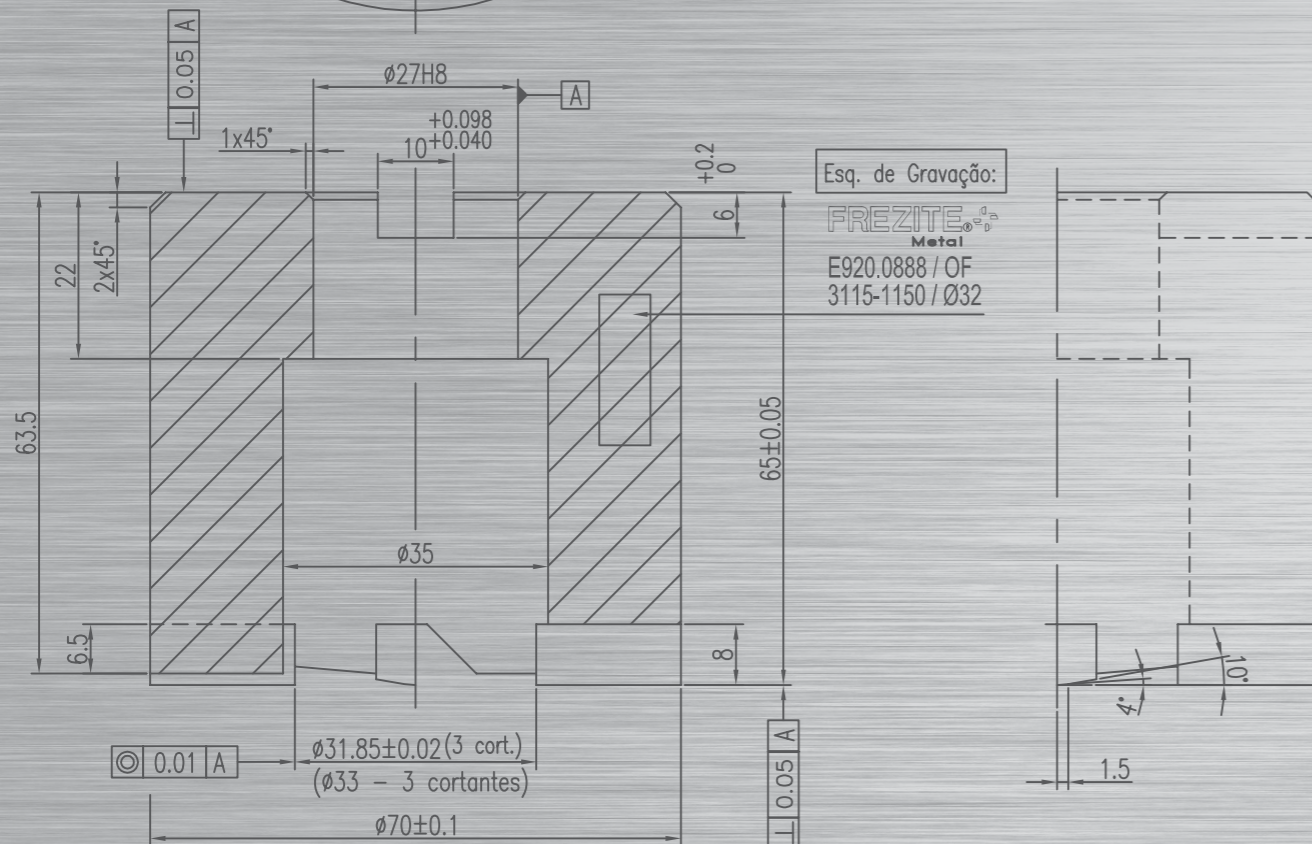
MATERIAL: GRAY CAST IRON



## DRILL E920.0888

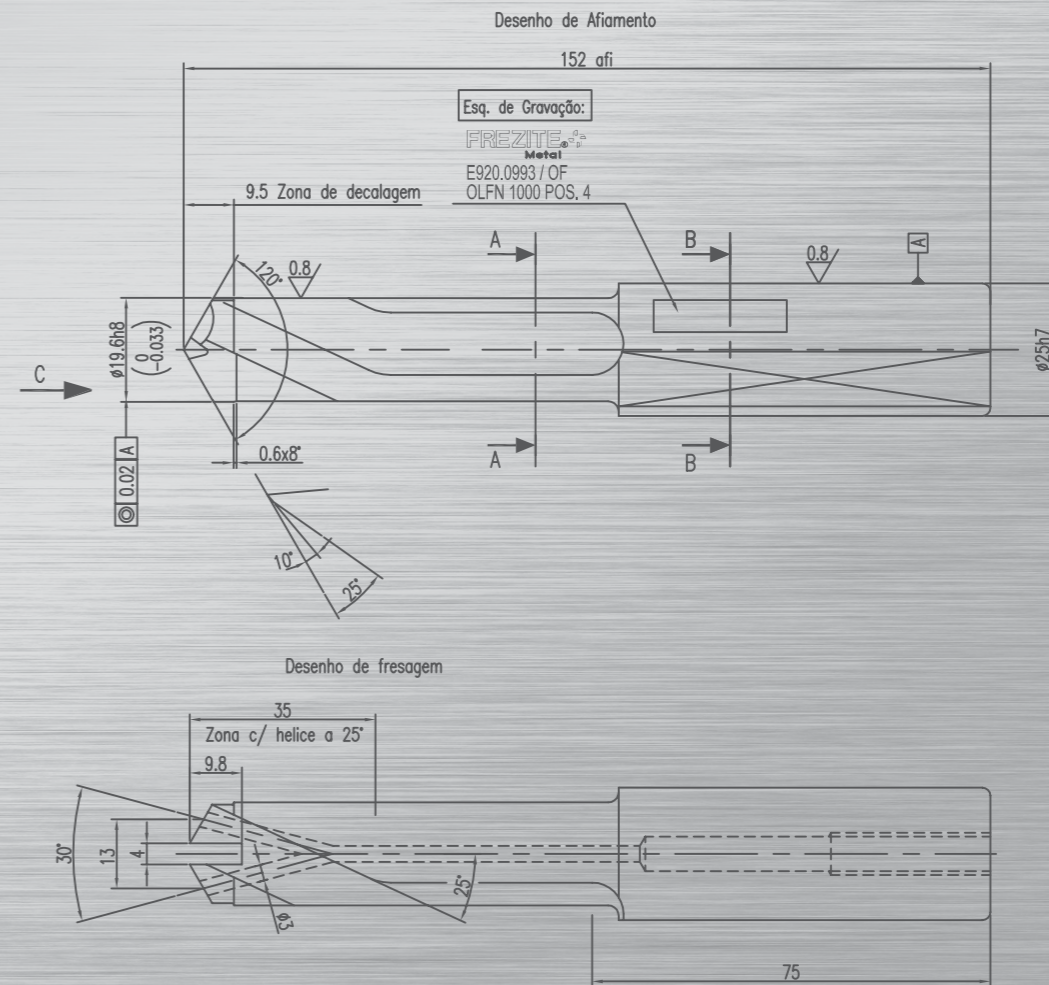
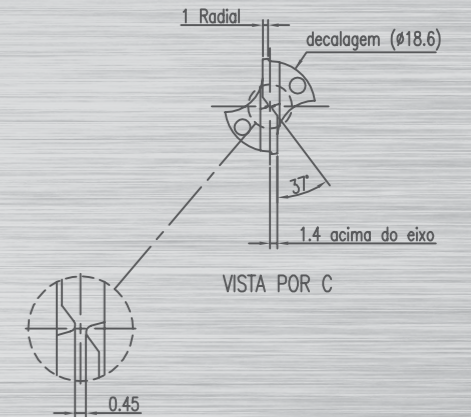


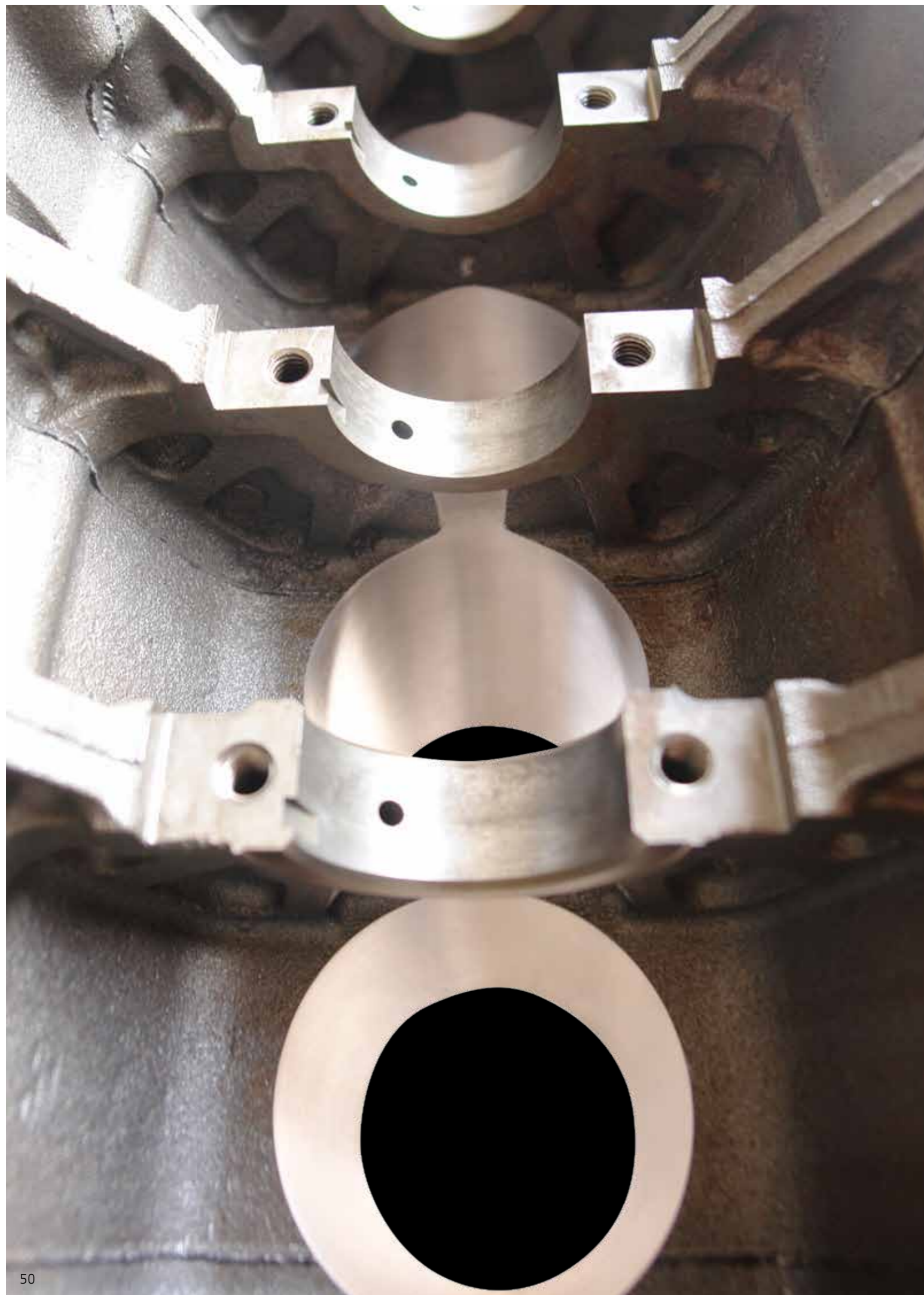
Nota: Cast iron tool



## DRILL E9200993

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# CRANK BAR BORE

MATERIAL: CAST IRON CGI



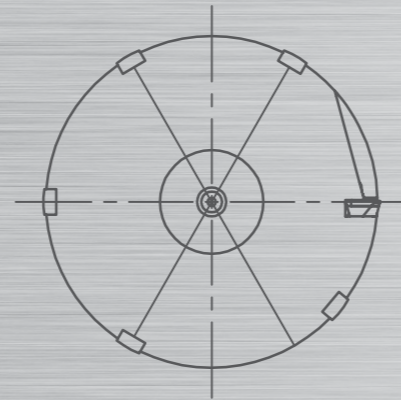
## PILOT FINE BORING E944.0160

E944.0160 is a large diameter pilot fine-boring tool for the E944.0161.

**Material:** CGI

**Cutting Parameters:**

S - 500 Rpm  
 Vc - 102 m/min  
 Feed - 75 mm/min  
 Fz - 0.15 mm



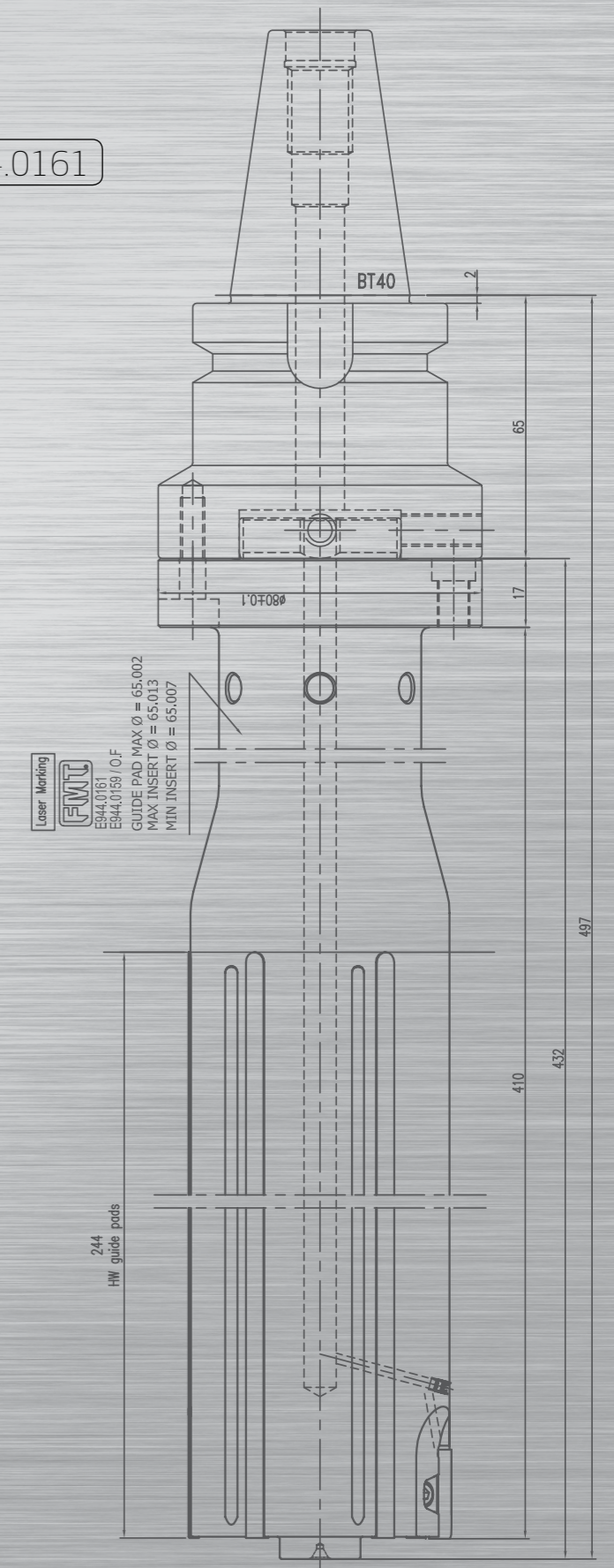
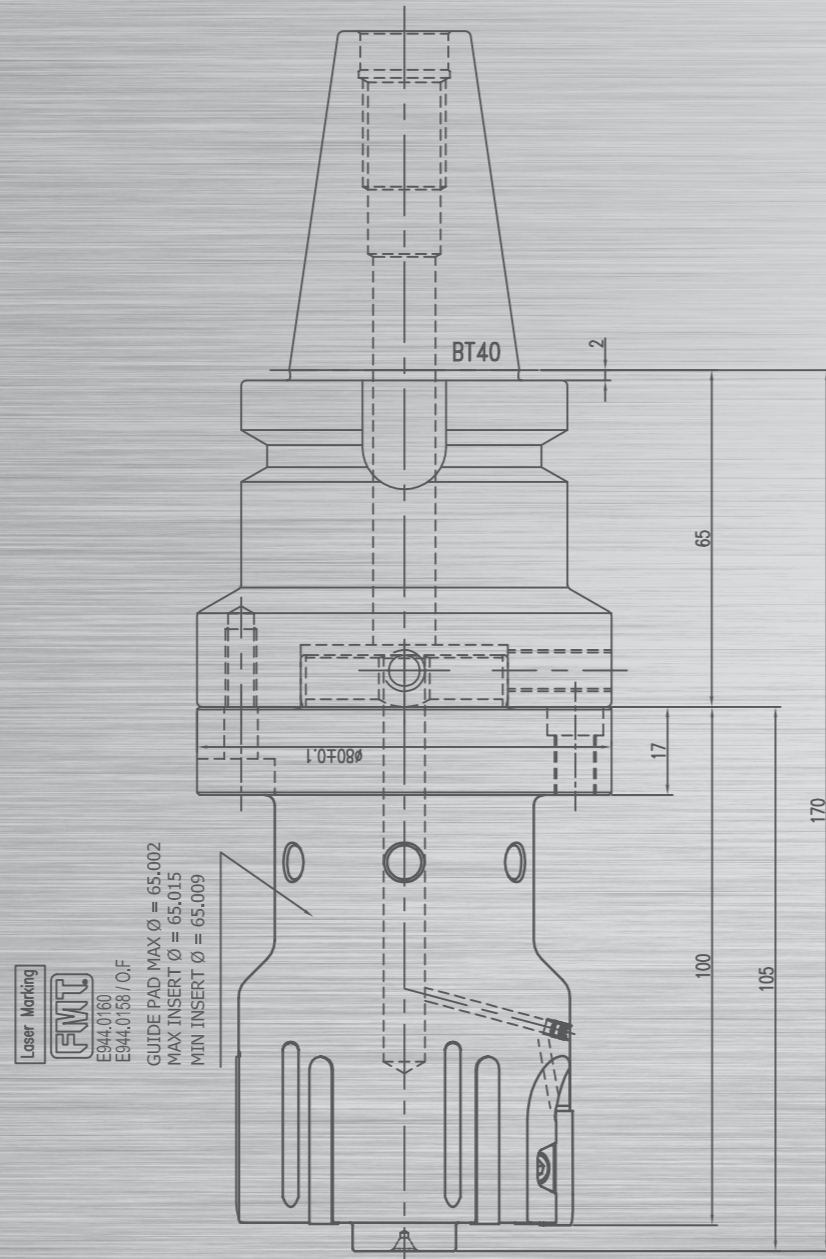
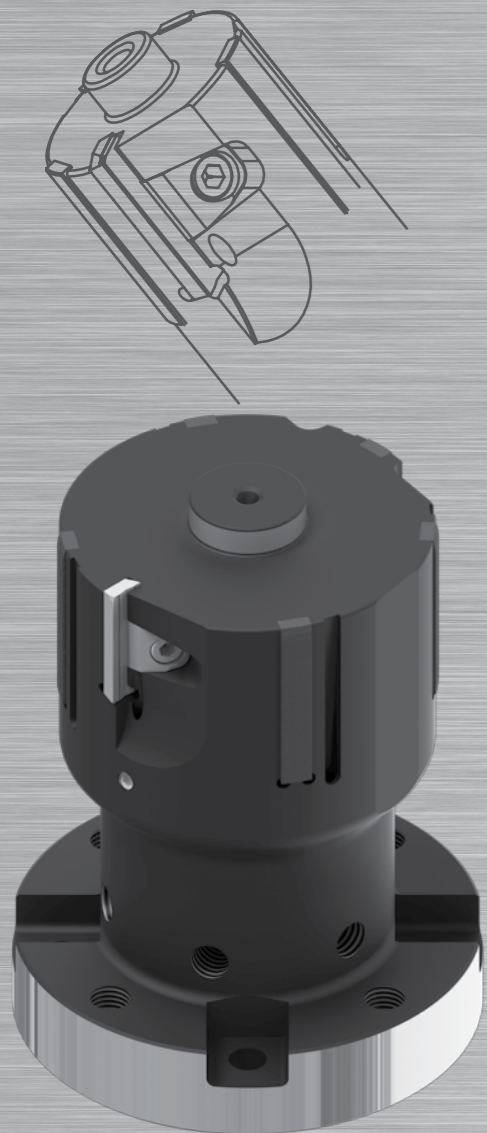
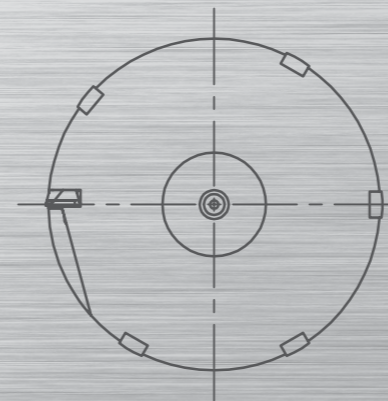
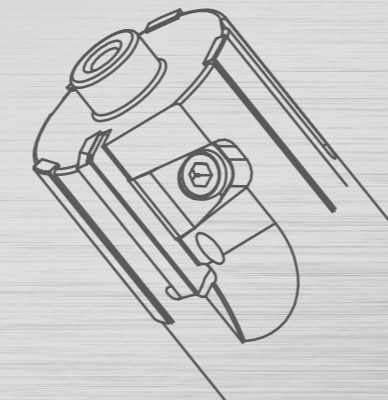
## FINE BORING TOOL E944.0161

E944.0161 is a large diameter fine boring tool for tight tolerances and concentricity machining.

**Material:** CGI

**Cutting Parameters:**

S - 500 Rpm  
 Vc - 102 m/min  
 Feed - 75 mm/min  
 Fz - 0.15 mm





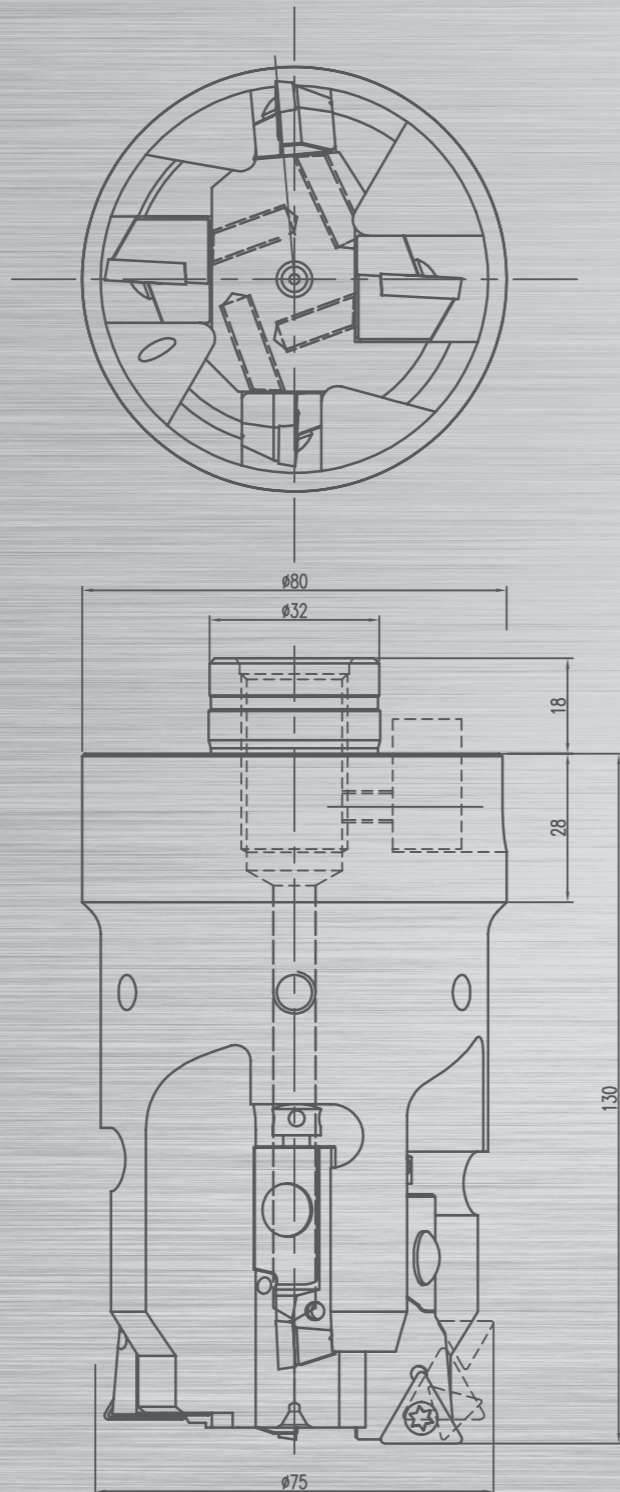
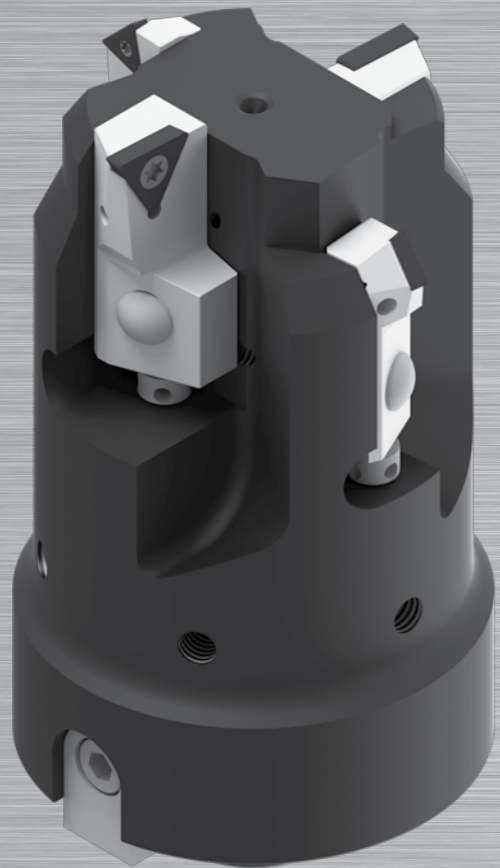
# GENERAL DRILLS

MATERIAL: CAST IRON



## ISO ELEMENTS DRILL E930.0898

With several adjustable cartridges this drill is capable of achieving high tolerances and deal with the inserts tolerances variability.

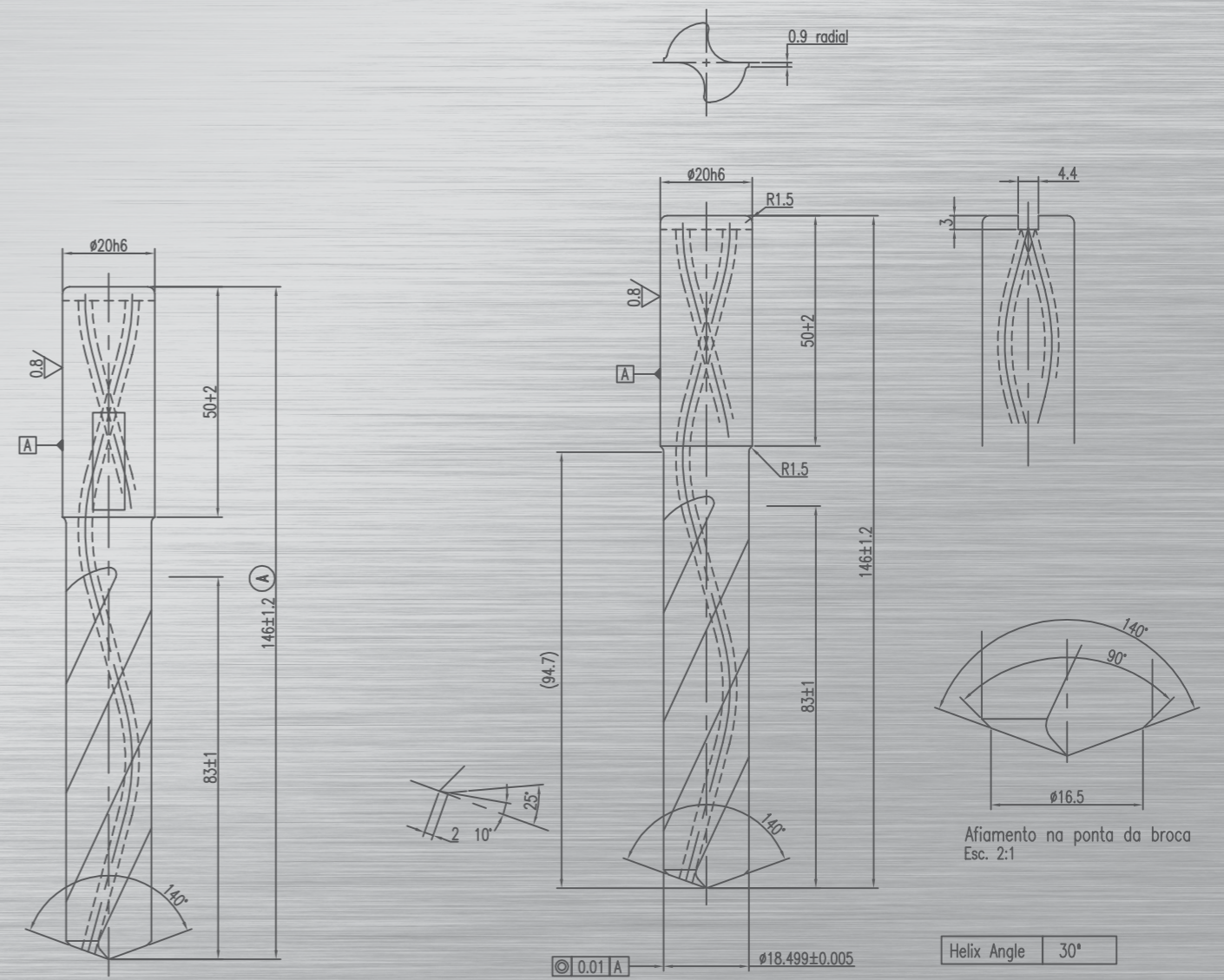


## DOUBLE ANGLE DRILL E922.2059

With a corner chamfer protecting the cutting edge from the abrasiveness of the cast iron this drills has excelled in tool life parameters, and better hole quality.

The double chamfer also works as a chip breaker while also reducing burr when breaking through.

**Material:** GGG55  
**Machine:** BA 400  
**Cutting Parameters:**  
 S - 2065 Rpms  
 Vc - 120 m/min  
 Feed - 365 mm/min  
 Fz - 0,088 mm

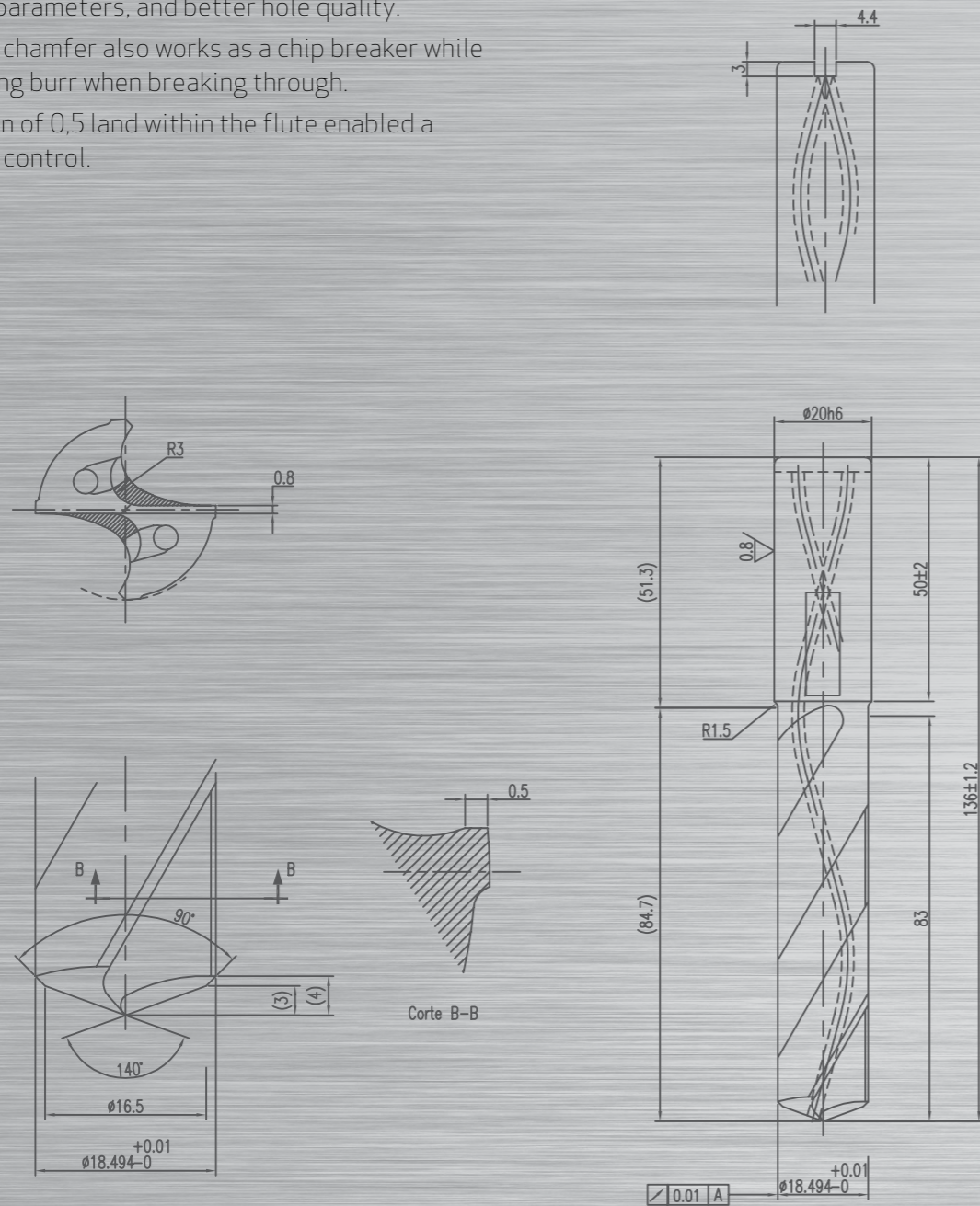


## DOUBLE ANGLE DRILL E922.3196

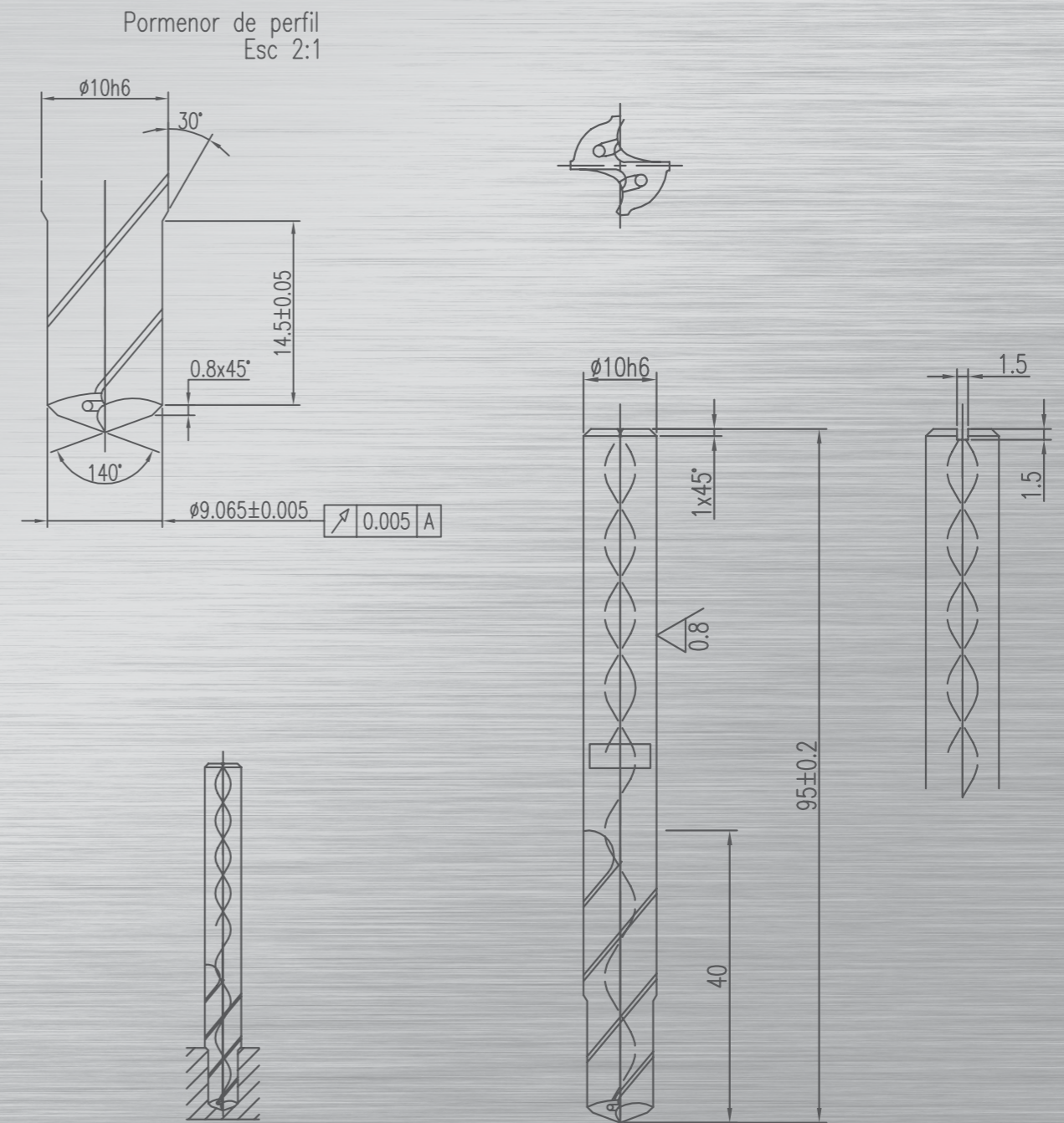
With a corner chamfer protecting the cutting edge from the abrasiveness of the cast iron this drills has excelled in tool life parameters, and better hole quality.

The double chamfer also works as a chip breaker while also reducing burr when breaking through.

The addition of 0,5 land within the flute enabled a better chip control.



## DOUBLE ANGLE STEP DRILL E922.5536

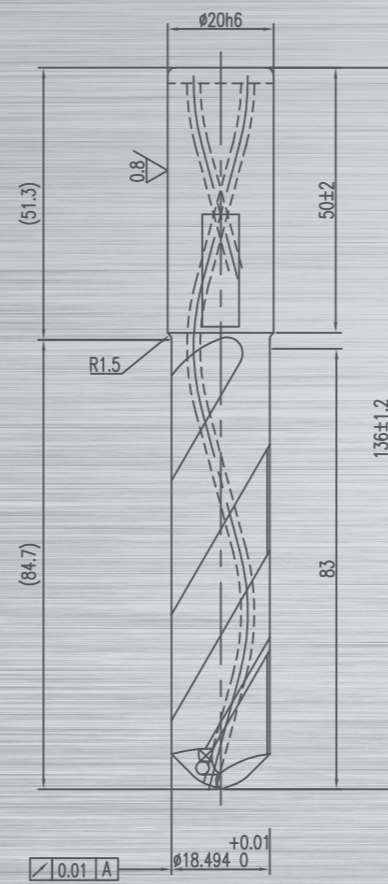
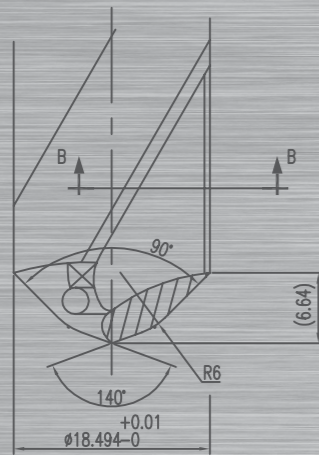
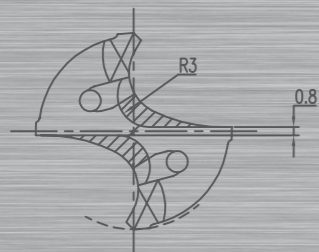




## “BICKFORD” DRILL E922.3199

With a combination between the helical and the radius drill, this drill tip combines self-centering capabilities with a long tool life while also enabling higher feeds.

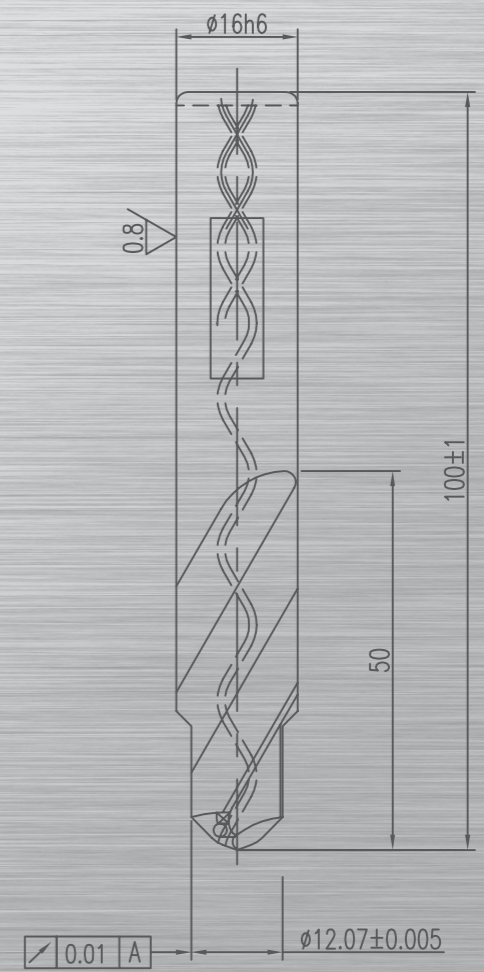
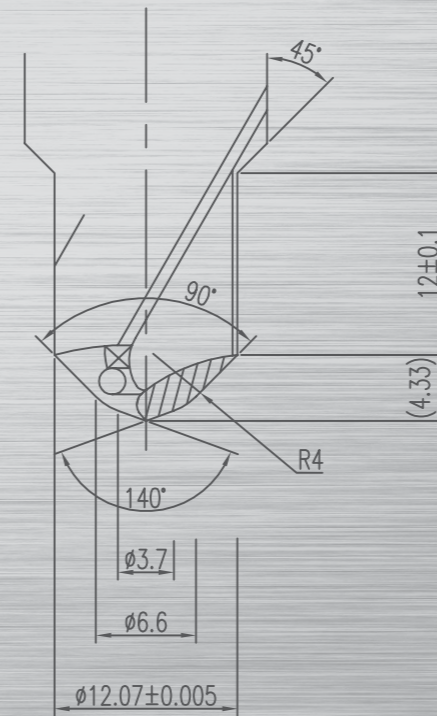
These drills can do without previous pilot drilling and produce a reduced burr when breaking through.



## “BICKFORD” DRILL E922.3337

With a combination between the helical and the radius drill, this drill tip combines self-centering capabilities with a long tool life while also enabling higher feeds.

These drills can do without previous pilot drilling and produce a reduced burr when breaking through.



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