FMT®
Tooling Systems

TOOLS FOR CAST IRON MACHINING - EN

CMC

MKFMT1.031A 04/2015

Big challenges, Great solutions!

TOOLS FOR CAST IRON MACHINING

www.fmttooling.com

FREZITE Group

FREZITE, A HISTORY OF SOUNDNESS AND INNOVATION

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.

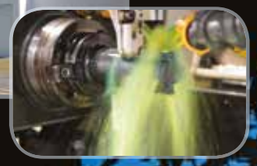
The opportunities generated by the surge of the automobile and aerospace sectors have led to the automation of the Metal Division and the creation of the **FMT – Tooling Systems brand.**

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

UNITED KINGDOM

MEXICO



CZECH REP.

BRAZIL

GERMANY

POLAND

ROMANIA

SPAIN

PORTUGAL

GLOBALLY WELL POSITIONED

FREZITE Group

A touch of innovation based on experience

MISSION

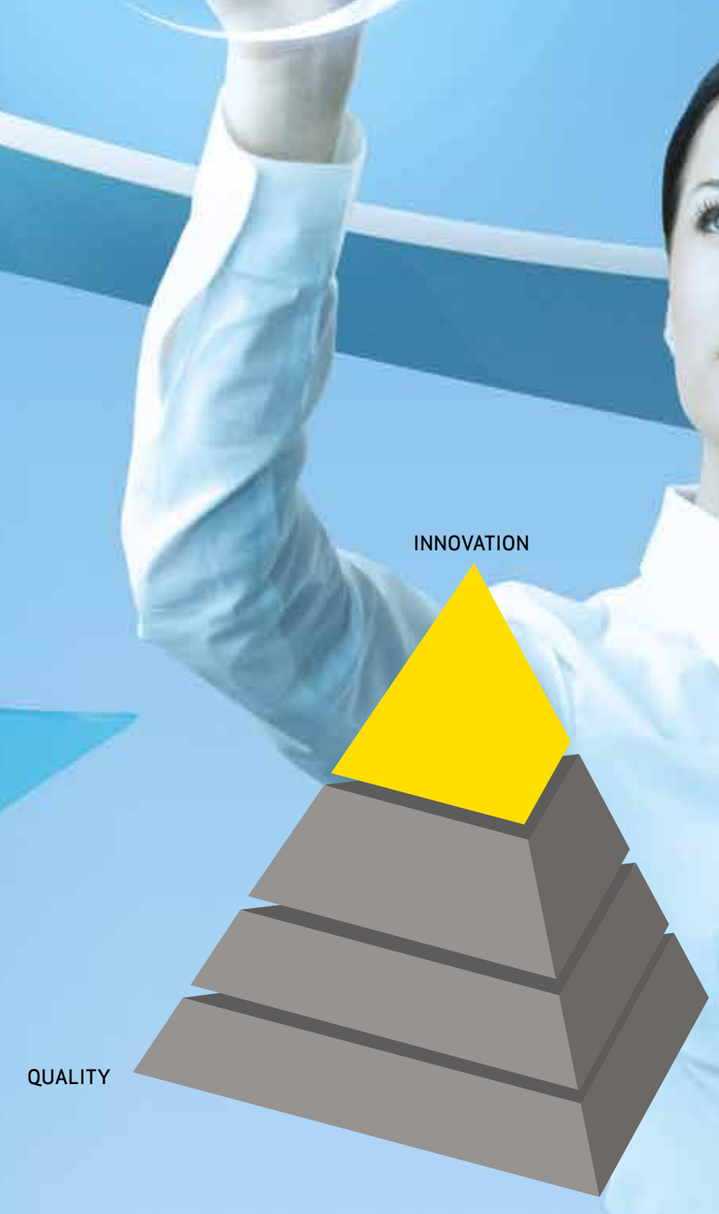
"TO BE AN ORGANIZATION RECOGNIZED FOR ITS EFFICIENCY IN MAINTAINING AND CREATING VALUE."

VISION

"TECHNOLOGY DEVELOPMENT FOR SUSTAINABLE IMPROVEMENT OF QUALITY OF LIFE."

VALUES

"INTEGRITY, TEAM WORK AND INNOVATION."



FREZITE Group

INDUSTRIES/MARKETS

AUTOMOBILE

AERONAUTICS

ELECTRONIC

MEDICAL

MOULDING

VALVES

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

FMT® Tooling Systems

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.

FREZITE Group

FMT Tooling Systems

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.

THE POWER OF ENGINEERING

FREZITE Group

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.
FMT
Tooling Systems
FREZITE Group

“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

The best quality

The best cost effectiveness

FREZITE Group

FMT Tooling Systems

WE WANT TO BE THE BEST, NOT THE BIGGEST.

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

FMT Tooling Systems 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

FMT Tooling Systems 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

FMT Tooling Systems

FREZITE Group

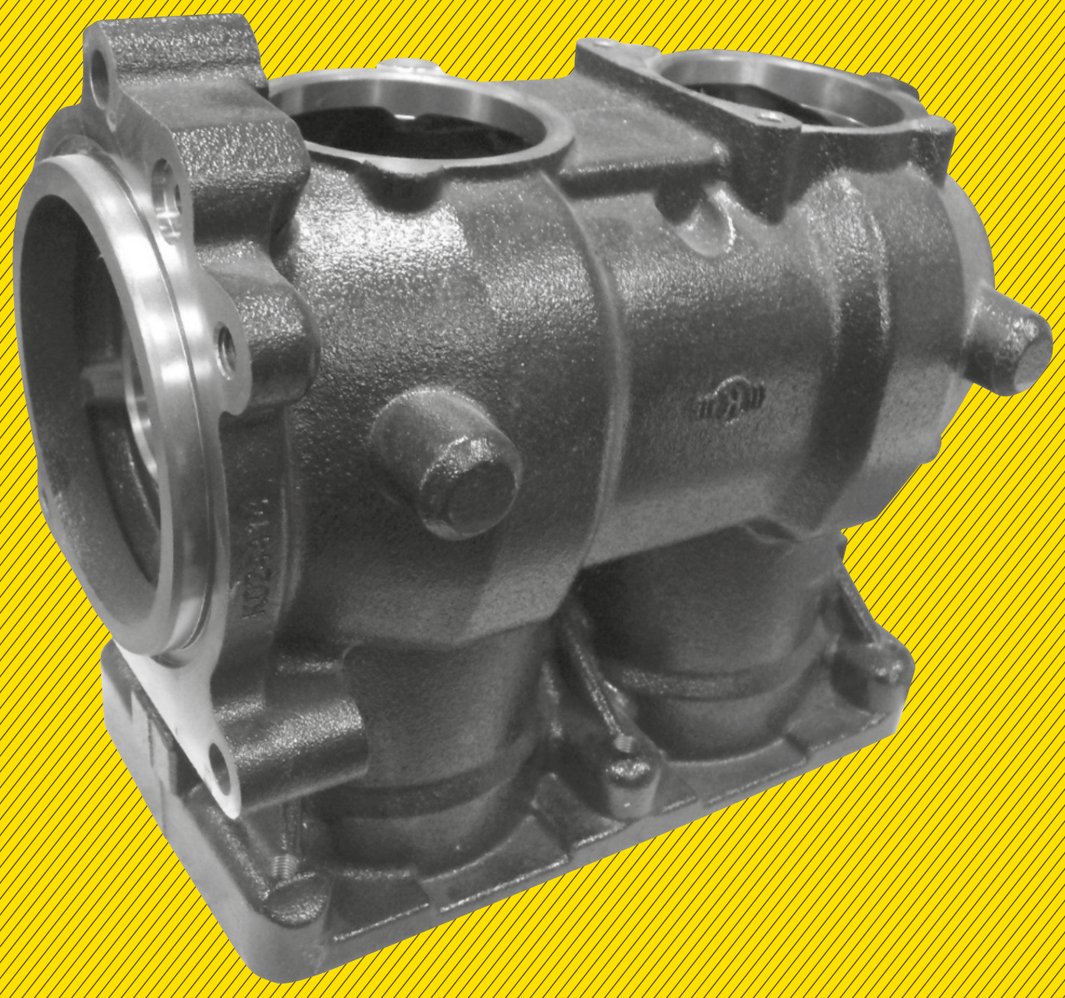
TOOLS FOR CAST IRON MACHINING

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

PCBN (Polycrystalline Cubic Boron Nitride) 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.



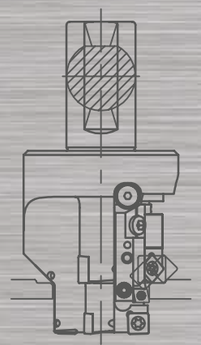
COMPRESSOR HOUSING

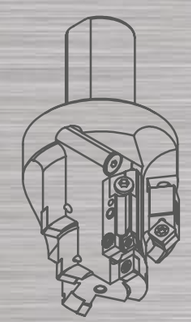
MATERIAL: CAST IRON

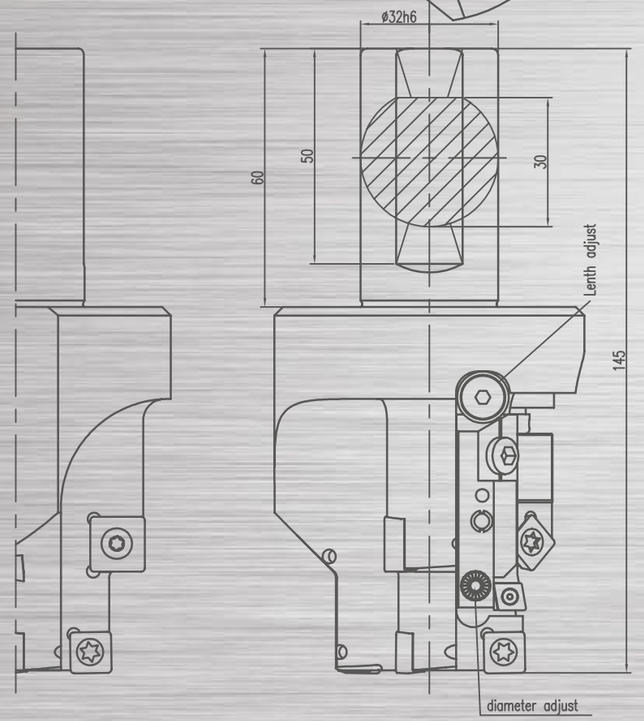
FMT® Tooling Systems

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.

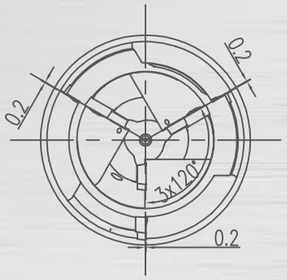


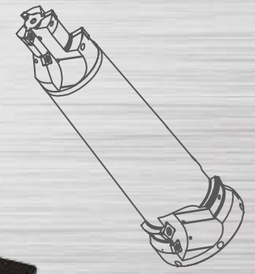




DRILL E931.0710

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

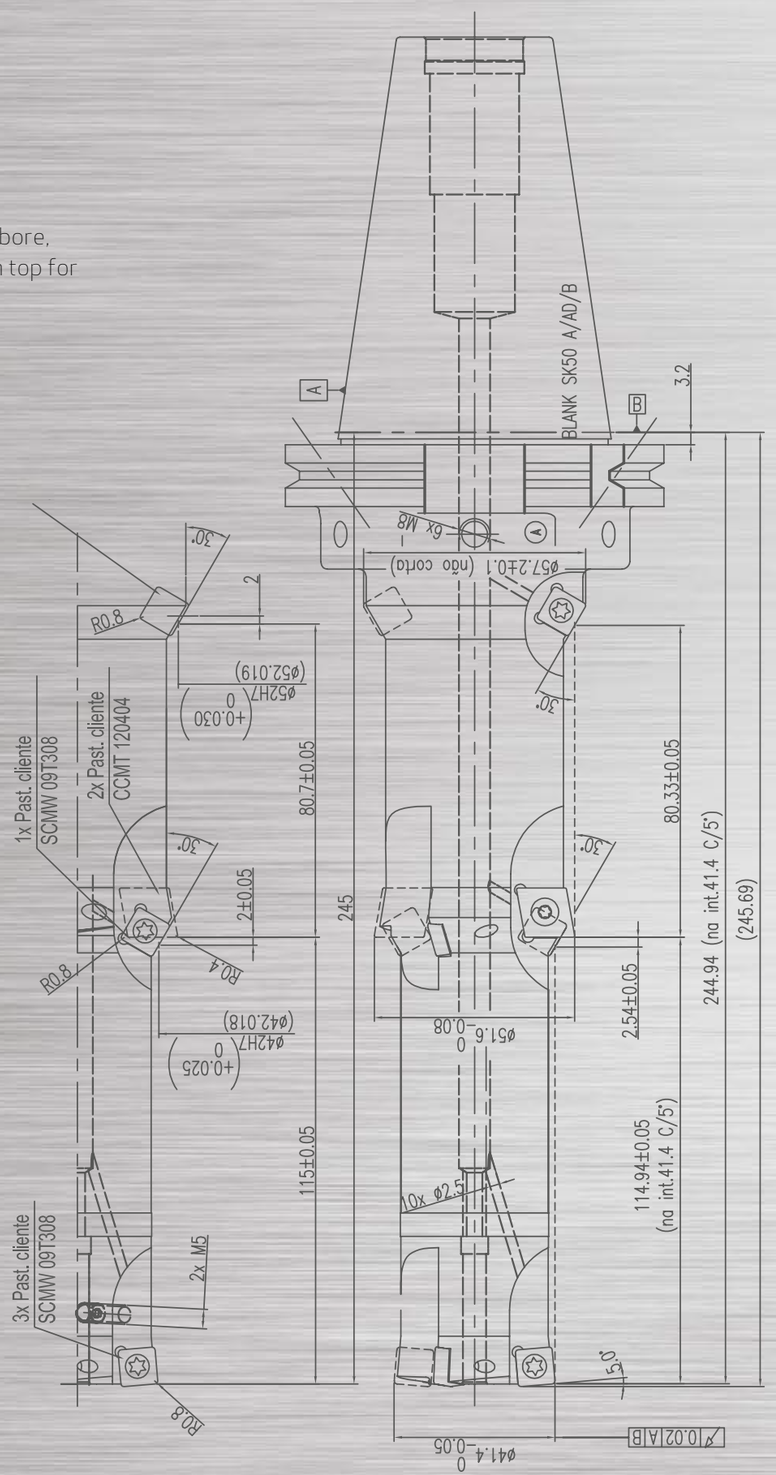




COMPRESSOR HOUSING

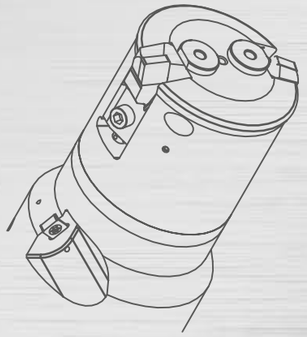
DRILL E931.0712

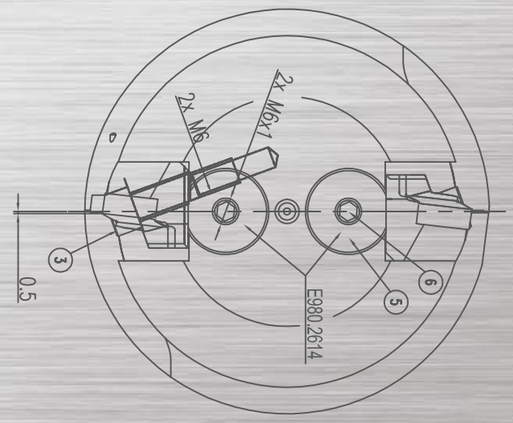
931.0712 drill is designed for a long bore, while combining a hard-metal drill on top for a secondary operation.

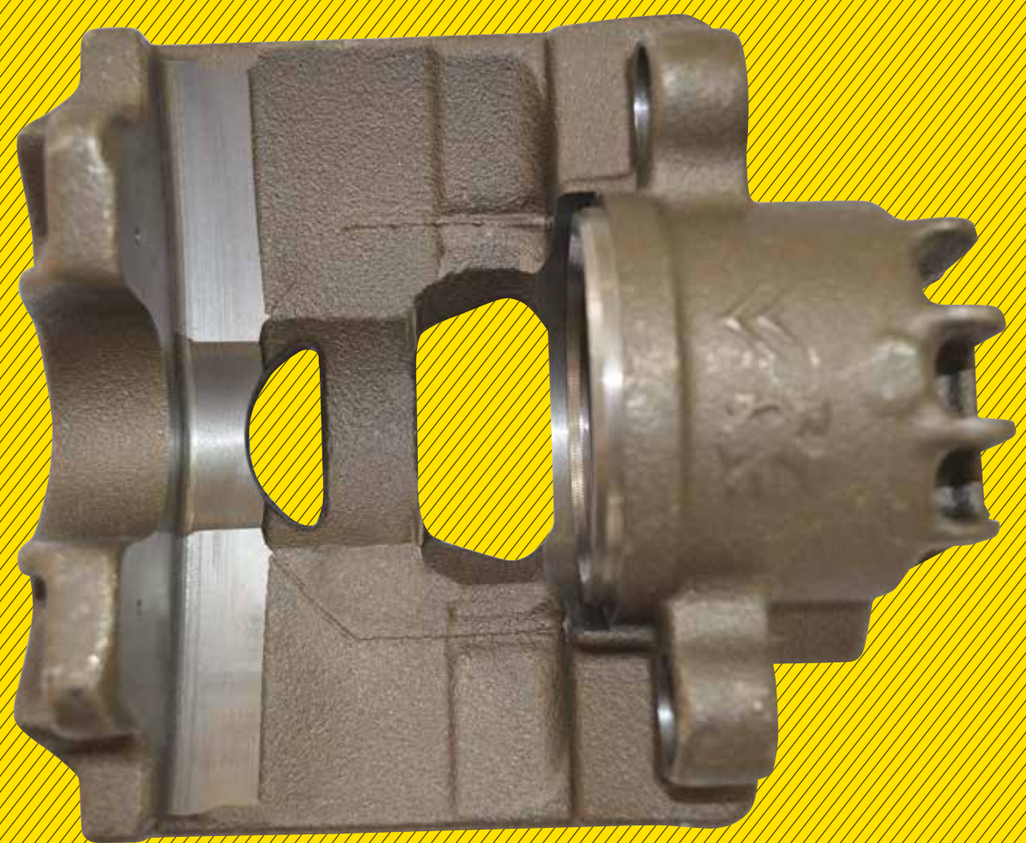


DRILL E931.0817

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







BRAKE CALLIPER

MATERIAL: CAST IRON
GGG55

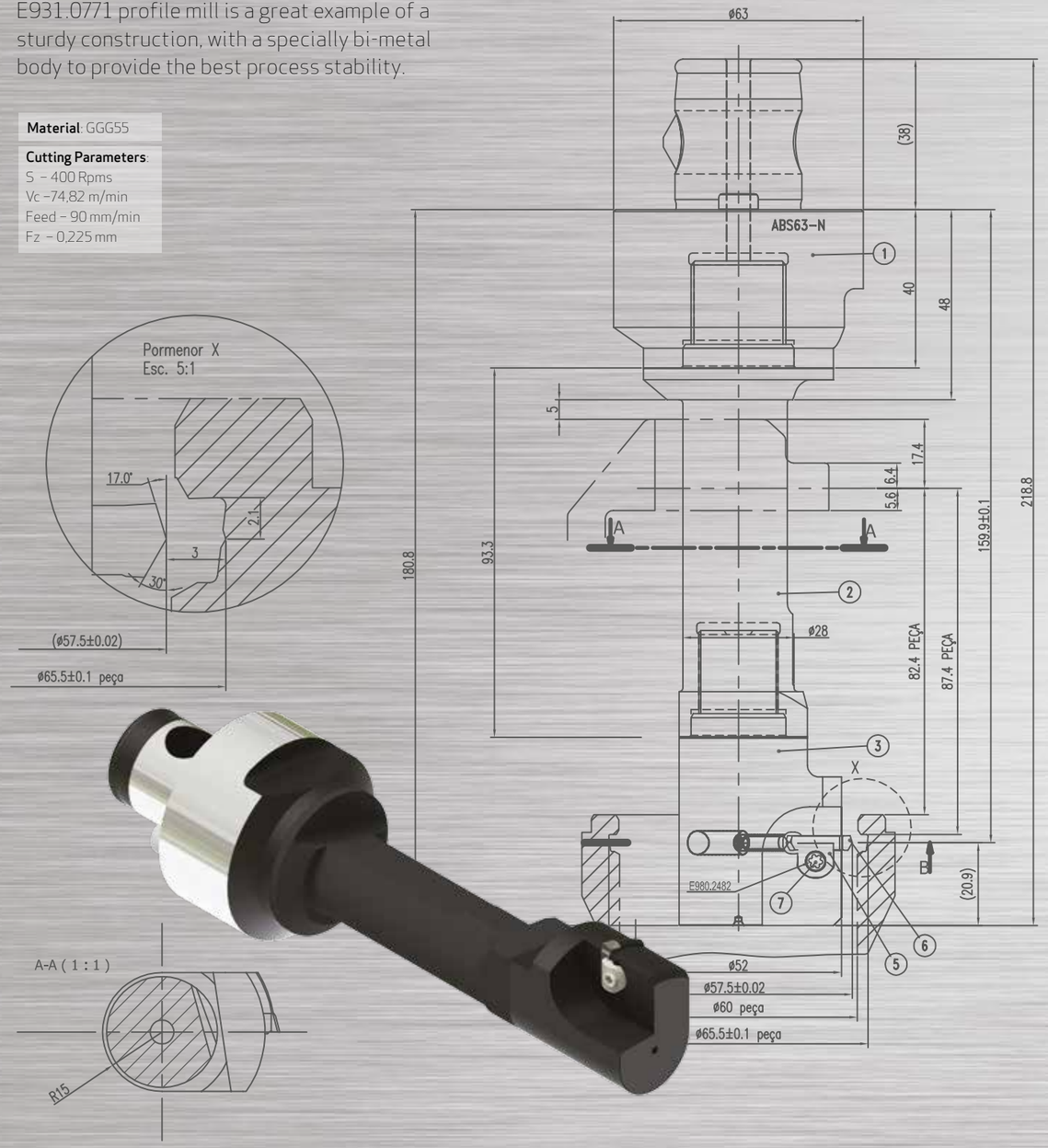
FMT® Tooling Systems

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 Rpms
Vc –74,82 m/min
Feed – 90 mm/min
Fz – 0,225 mm

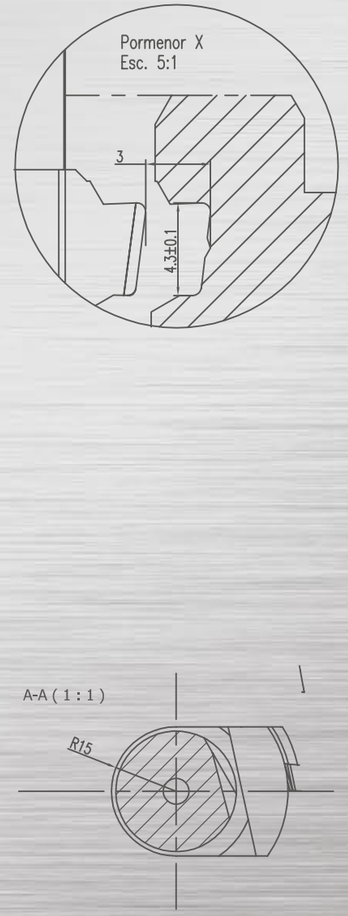


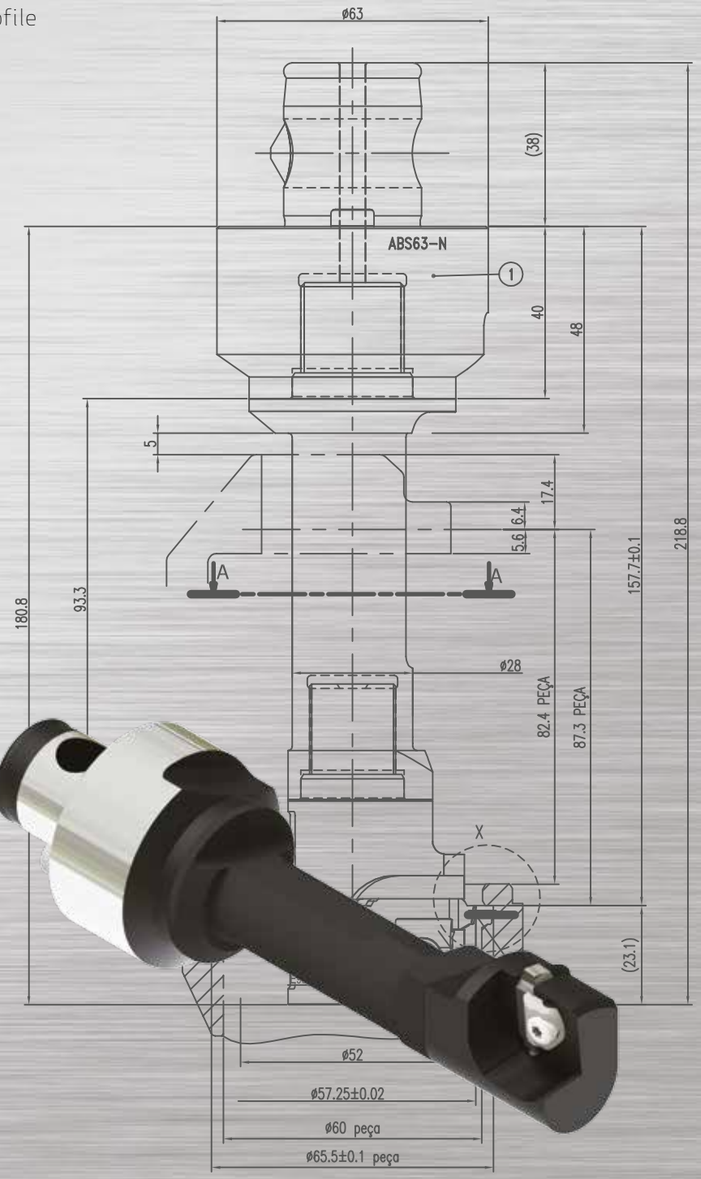
MILL E931.0770

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

Material: GGG55

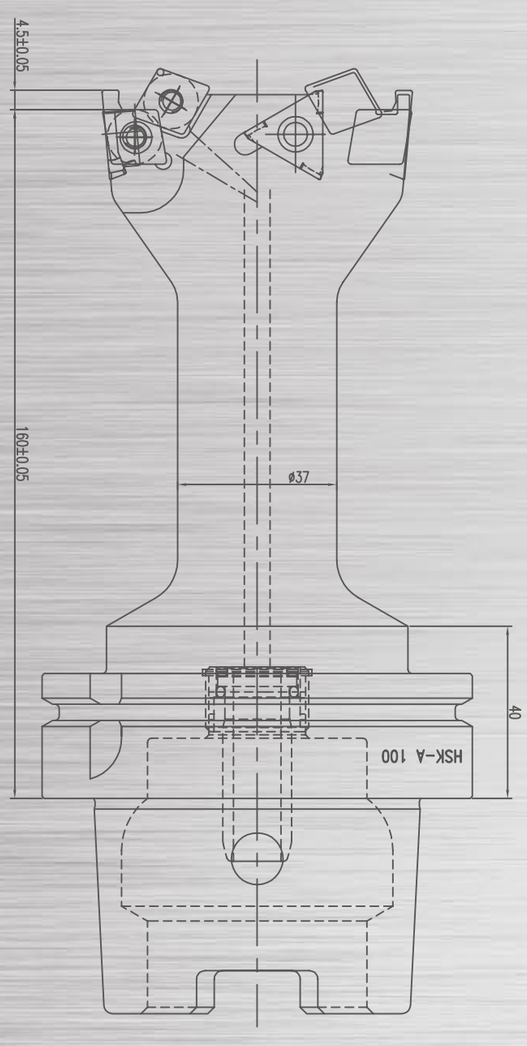
Cutting Parameters:
S – 400 Rpms
Vc –74,82 m/min
Feed – 90 mm/min
Fz – 0,225 mm

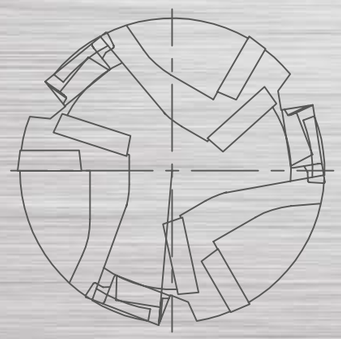




DRILL E931.0257

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





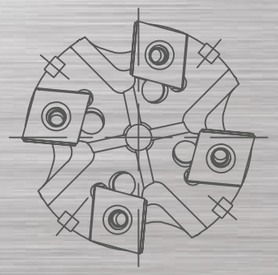
REAMER E931.0229

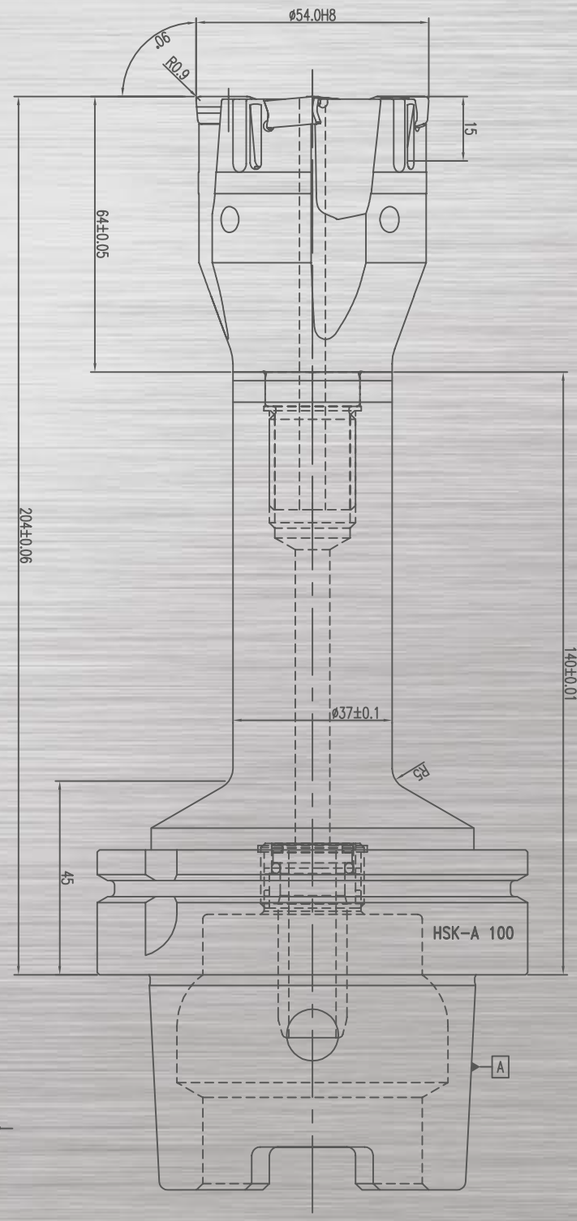
The E931.0229 "One-Shot" drill is one of the most successful examples in this list due to its capability of reaming to H8 tolerance without previous operations.

Machining Centre: BA 400

Material: GGG 55

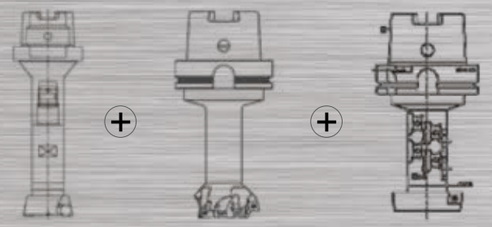
Cutting Parameters:
S – 900 Rpms
Vc – 153 m/min
Feed (initial) – 400 mm/min
Feed (end of bore)– 250 mm/min





BRAKE CALLIPER

TRIPLE TOOL COMBINATION



#	Tool	Time [min]
#1	Milling Cutter ø71.7	0.576
# 2	Milling Cutter ø72.05	0.226
# 3	Boring Cutter ø53	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

Machinning 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

FMT® Tooling Systems

FINE BORING PREVIOUS SOLUTION

Machining advantages of fine boring one shot tool:

› Dimensional precision

› Quick adjustment system

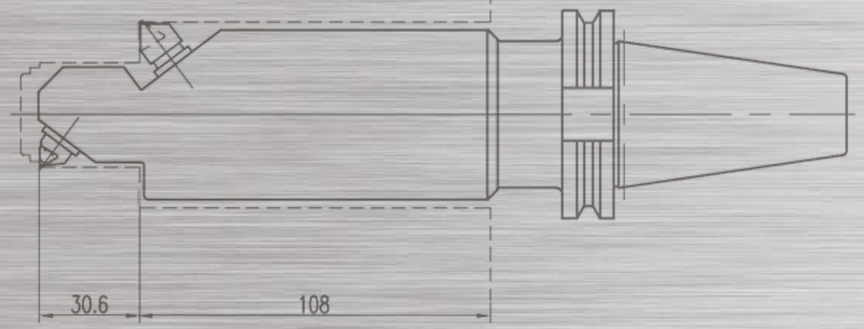
› One shot – Two operations with a single tool.

Tool Components

– Two microbores;

– Two hard metal ISO Inserts TCMT 090209 Cone SK40 (ISO40) DIN69871;

– Monoblock construction.

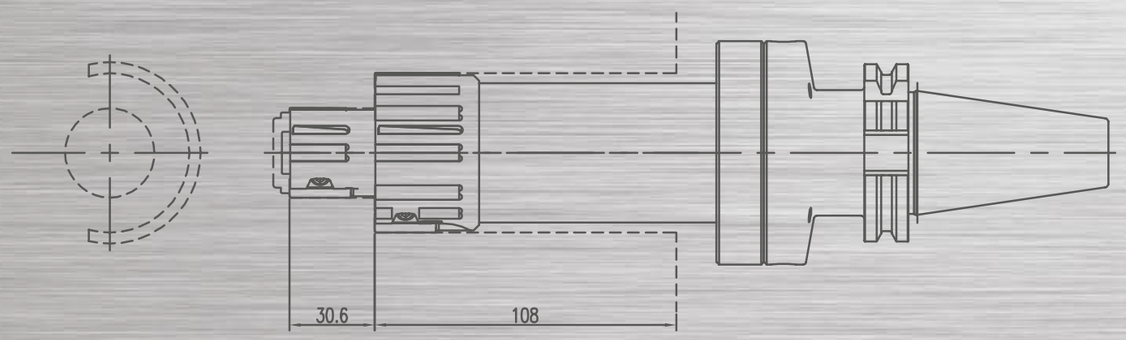


FINE BORING TOOL E944.0112

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 fine boring 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

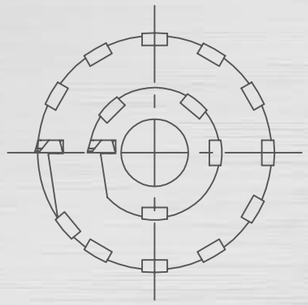
– 11 Cermet Guide pads ø57

– 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 = 90 secs	56% reduction
One Shot	**8 secs (1 tool change)**	**1 tool = 50 secs**	

	Financial savings in cycle time reduction		
	16 hours	22 workdays	220 workdays
Client's previous solution	368 €	8.096 €	81.696 €
One Shot	**206 €**	**4.534 €**	**45.750 €**

Machine plus machinist cost per hour = 23 €

ADVANTAGES

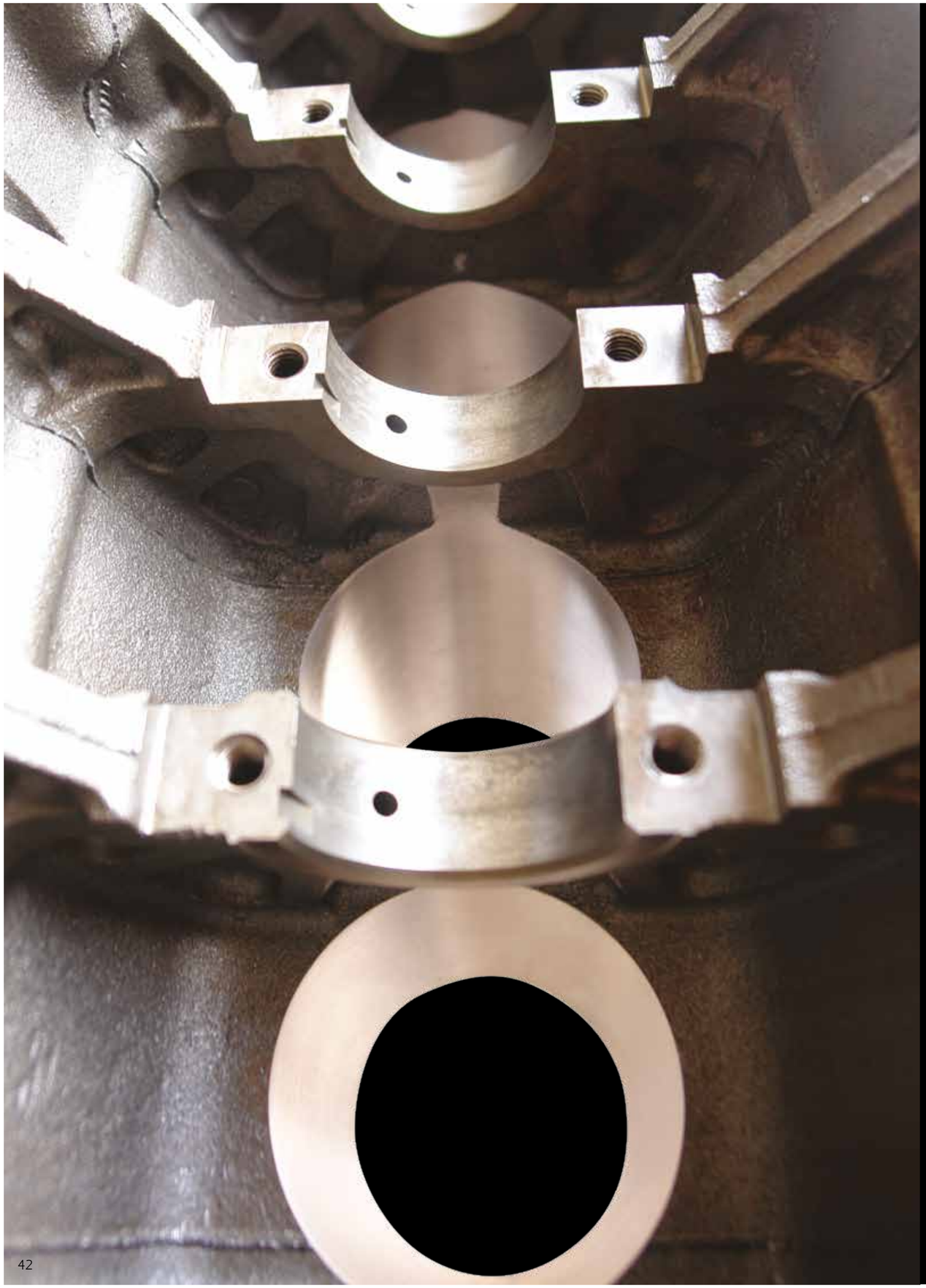
LESS TOOL CHANGES

LESS SET UPS

LONGER TOOL LIFE

MAGAZINE TOOL SPACE REDUCED

CYCLE TIME REDUCED



CRANK BAR BORE

MATERIAL: CAST IRON CGI

FMT® Tooling Systems

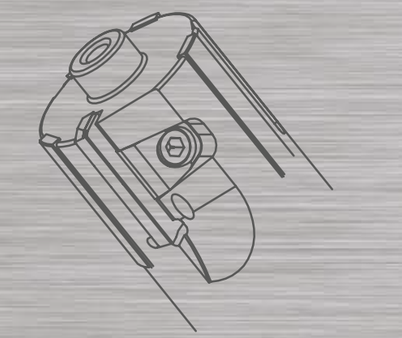
CRANK BAR BORE

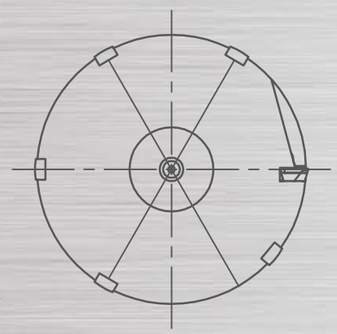
PILOT FINE BORING E944.0160

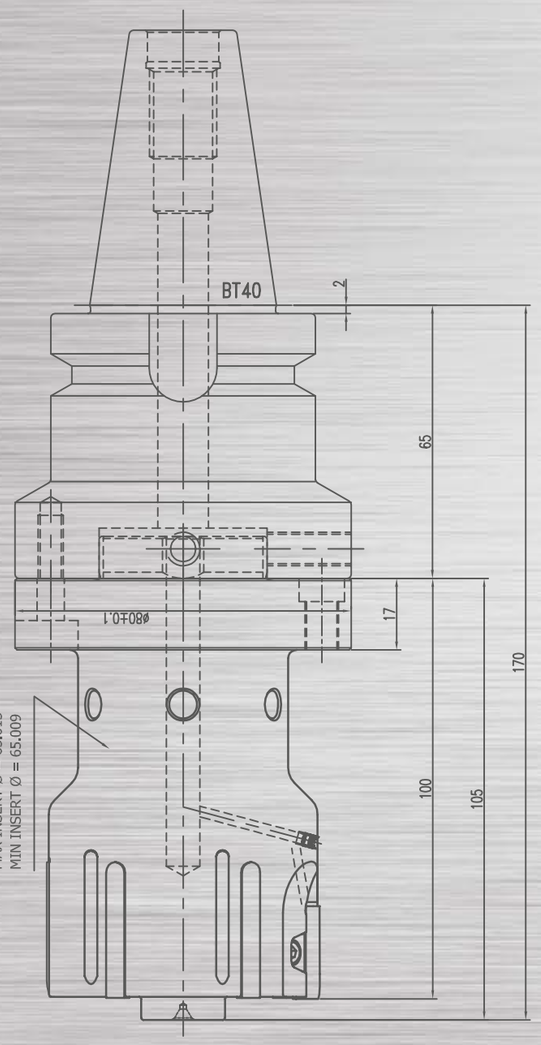
E944.0160 is a large diameter pilot fine-boring tool for the E944.0161.

Material: CGI

Cutting Parameters:
S – 500 Rpms
Vc – 102 m/min
Feed – 75 mm/min
Fz – 0,15 mm





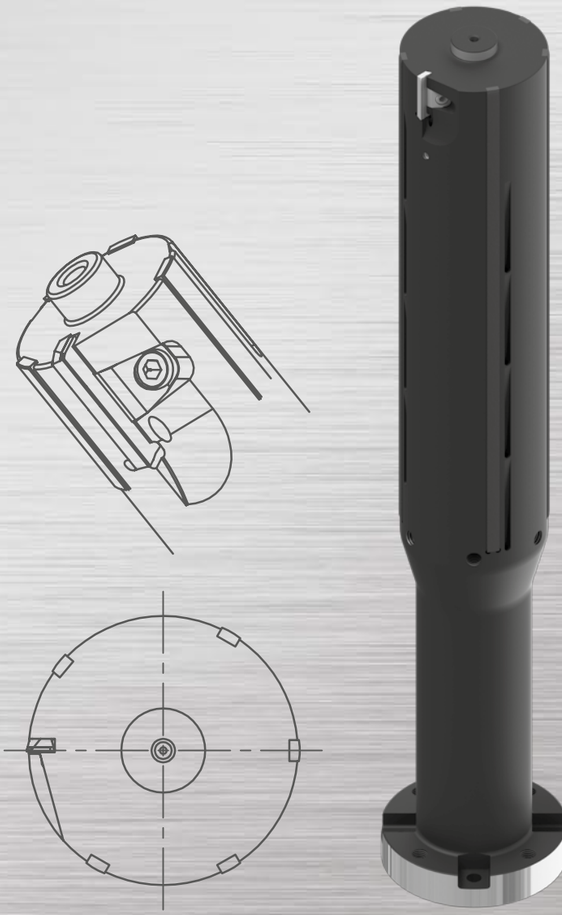


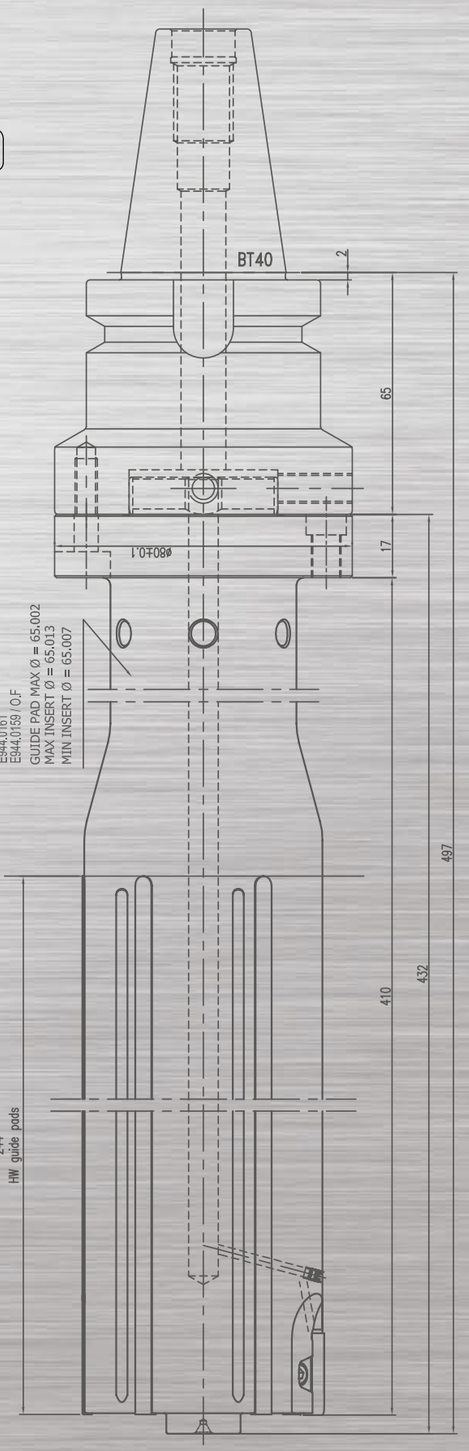
FINE BORING TOOL E944.0161

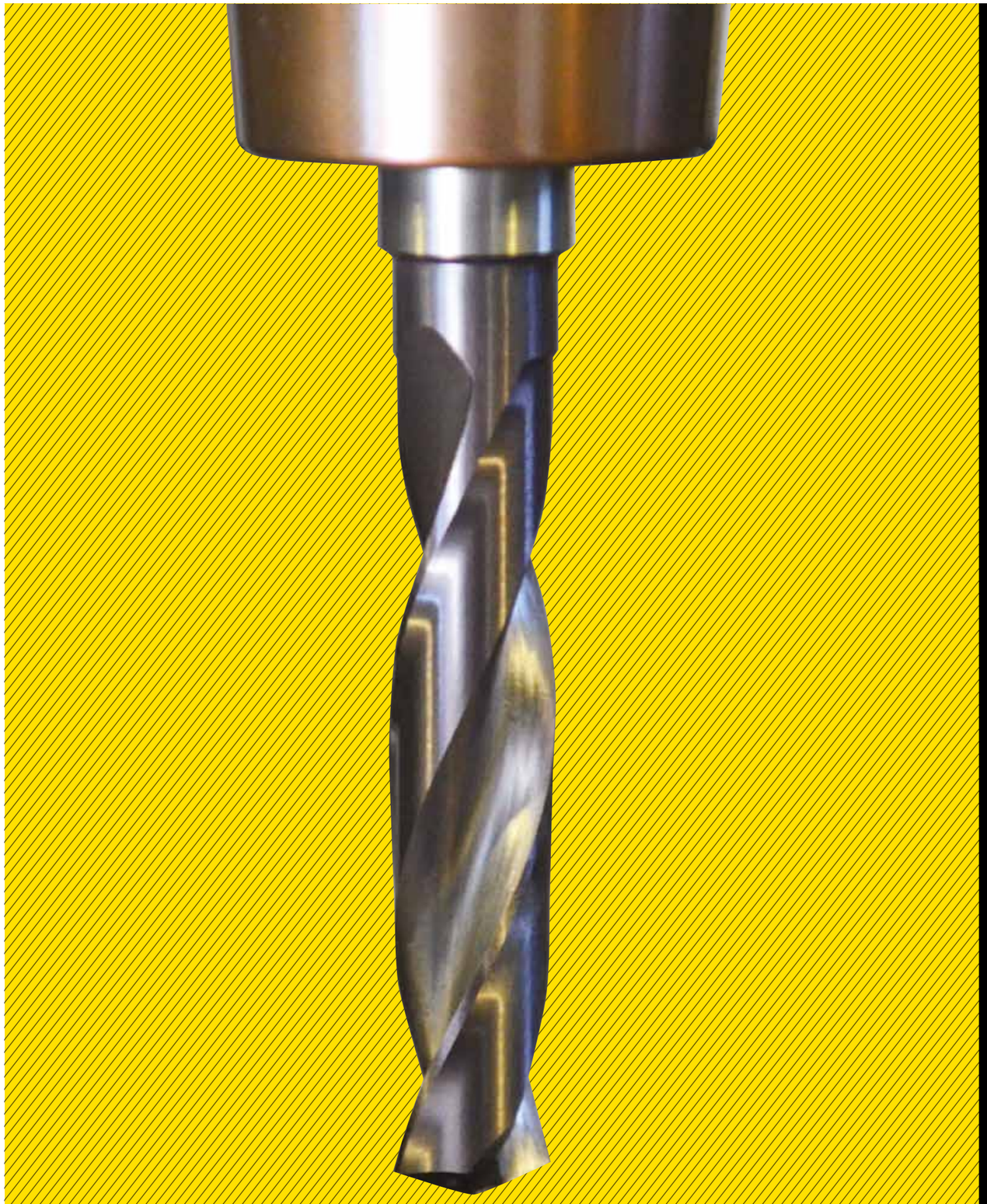
E944.0161 is a large diameter fine boring tool for tight tolerances and concentricity machining.

Material: CGI

Cutting Parameters:
S – 500 Rpms
Vc – 102 m/min
Feed – 75 mm/min
Fz – 0,15 mm







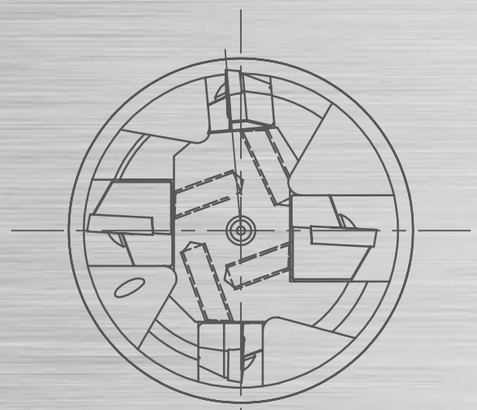
GENERAL DRILLS

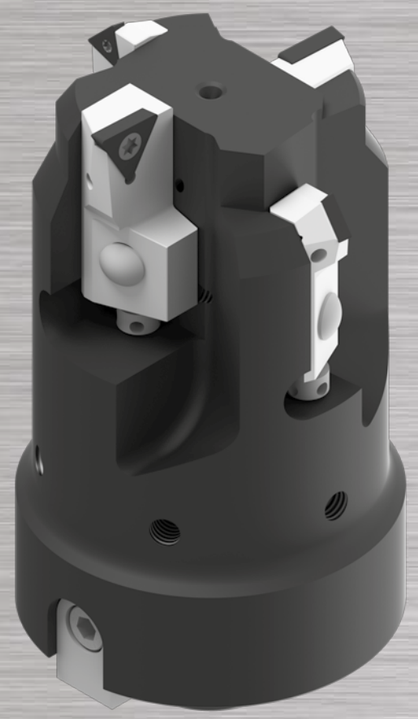
MATERIAL: CAST IRON

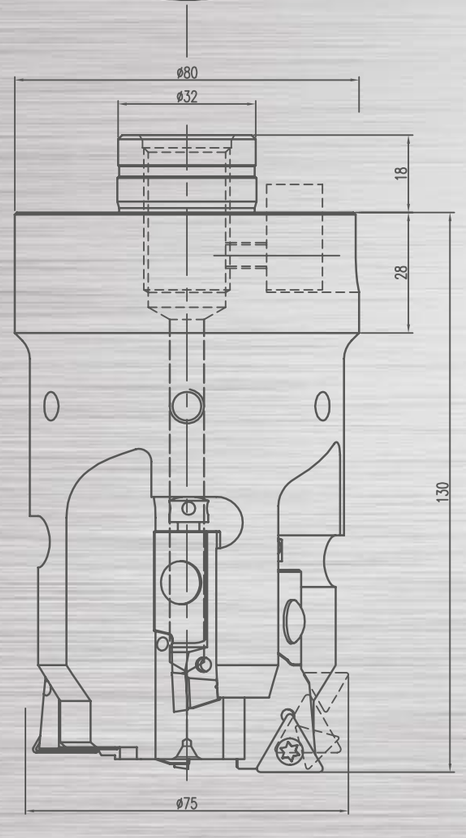
FMT Tooling Systems

ISO ELEMENTS DRILL E930.0898

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







DOUBLE ANGLE DRILL E922.2059

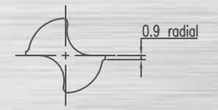
With a corner chamfer protecting the cutting edge from the abrasiveness of the cast iron this drills has excelled in tool life parameters, and better hole quality.

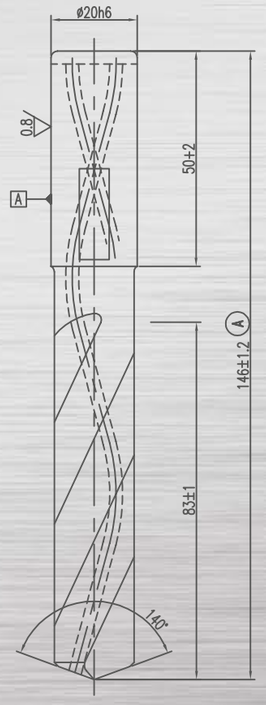
The double chamfer also works as a chip breaker while also reducing burr when breaking through.

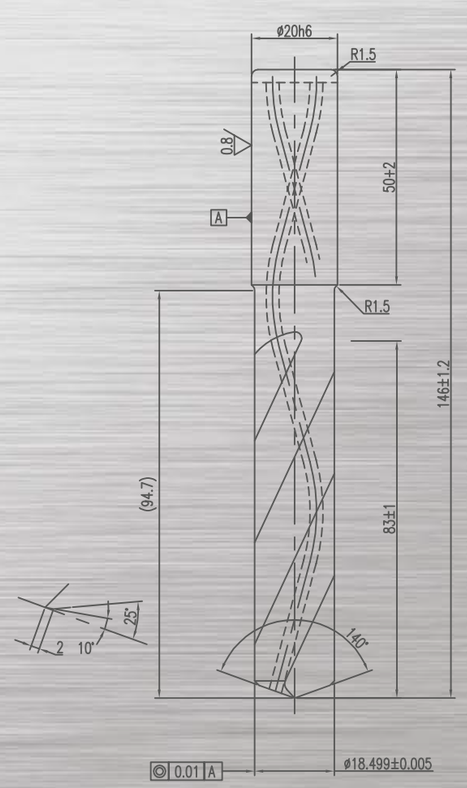
Material: GGG55

Machine: BA 400

Cutting Parameters:
S – 2065 Rpms
Vc – 120 m/min
Feed – 365 mm/min
Fz – 0,088 mm







Afiamento na ponta da broca
Esc. 2:1

Helix Angle	30°

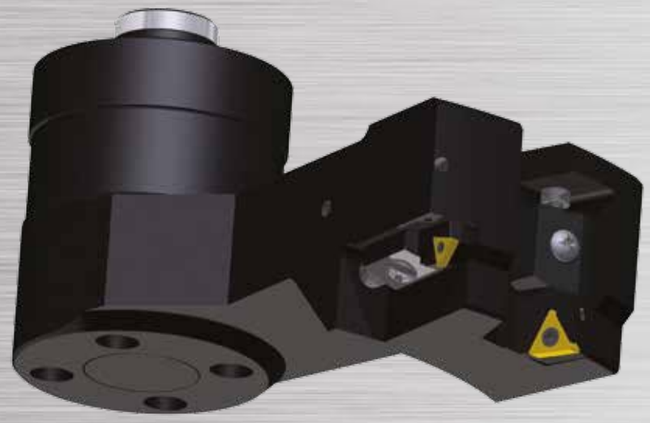
FMT ADVANTAGES

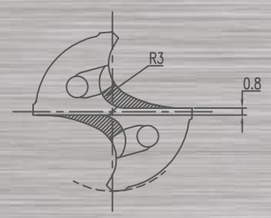
DOUBLE ANGLE DRILL E922.3196

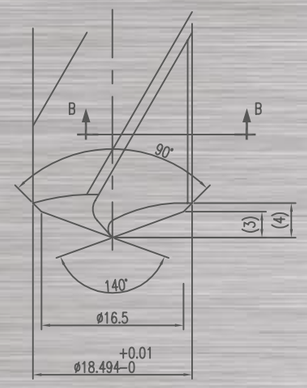
With a corner chamfer protecting the cutting edge from the abrasiveness of the cast iron this drills has excelled in tool life parameters, and better hole quality.

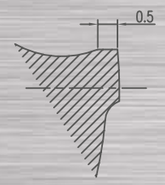
The double chamfer also works as a chip breaker while also reducing burr when breaking through.

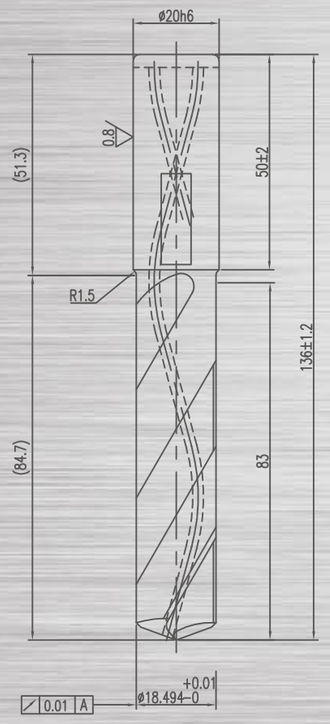
The addition of 0,5 land within the flute enabled a better chip control.



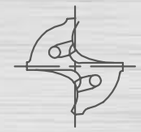


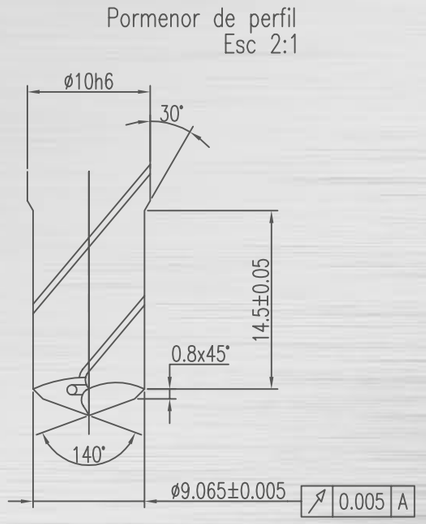


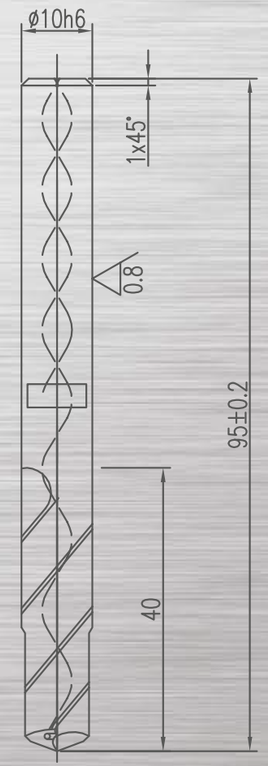


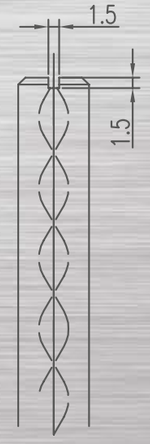


DOUBLE ANGLE STEP DRILL E922.5536





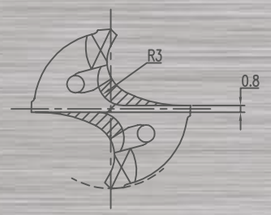


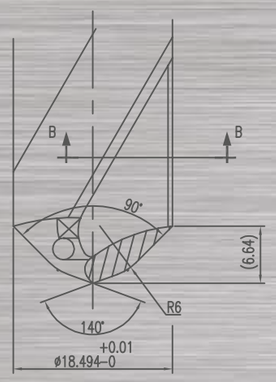


“BICKFORD” DRILL E922.3199

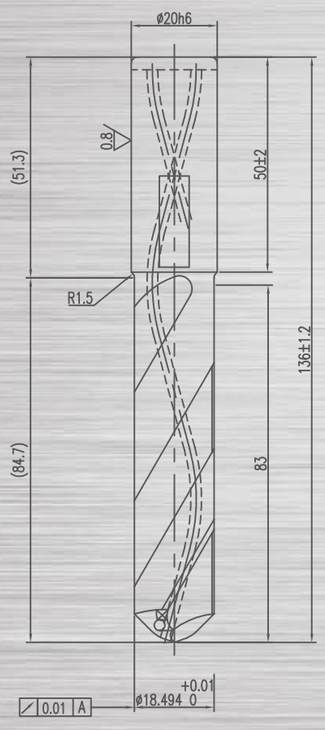
With a combination between the helical and the radius drill, this drill tip combines self-centering capabilities with a long tool life while also enabling higher feeds.

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





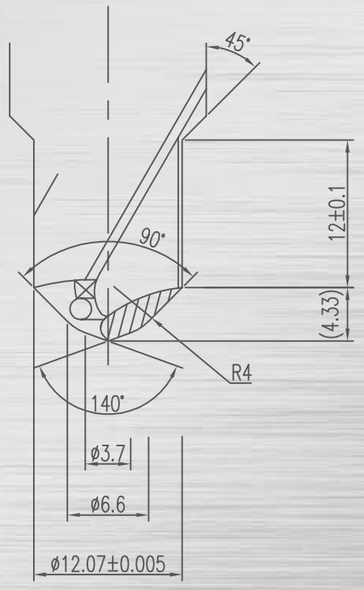
Corte B–B

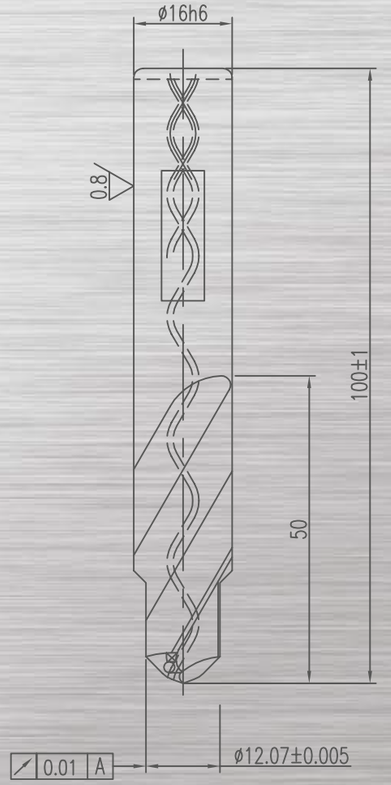


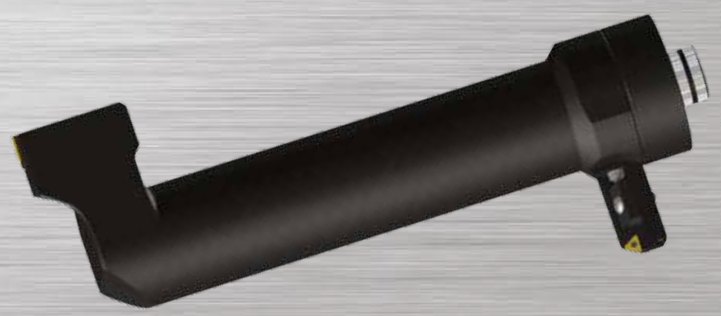
“BICKFORD” DRILL E922.3337

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.







FREZITE Group

PT Head Office:
FREZIGEST, SGPS, SA
Rua do Vau, 173 · Apartado 134
4786-909 Trofa
T. +351 252 400 360
F. +351 252 417 254
www.frezitegroup.com

PT FREZITE – Ferramentas de Corte, SA
Rua do Vau, 173 · Apartado 134
4786-909 Trofa
T. +351 252 400 360
F. +351 252 417 254
info@frezite.com
www.frezite.com

PT FREZITE – Ferramentas de Corte, SA (FMT)
Rua do Vau, 201 · Apartado 134
4786-909 Trofa
T. +351 252 400 360
F. +351 252 103 279
info@fmttooling.com
www.fmttooling.com

PT FREZITE – Equipamentos Energéticos & Ambiente, Lda.
Rua do Vau, 323 · Apartado 134
4786-909 Trofa
T. +351 252 400 758
F. +351 252 401 014
energia@frezite.com
www.energia.frezite.com

PT FREZITE – Ferramentas de Corte, SA (MF Metal)
Rua do Vau, 201 · Apartado 134
4786-909 Trofa
T. +351 252 103 277
F. +351 252 103 278
pedidos@mfmetal.net
www.mfmetal.net

ES FREZITE – Herramientas de Corte, SL
Polígono Ind. Virgen de la Salud, 8-A
P.O. Box 78
46950 Xirivella (Valencia)
T. +34 963 135 131
F. +34 963 796 810
info.es@frezite.com
www.frezite.com

ES Frezite Metal Tooling, SL
Polígono Ind. Virgen de la Salud, 8-A
P.O. Box 78
46950 Xirivella (Valencia)
T. +34 686 417 613
F. +34 963 134 484
info.es@fmttooling.com
www.fmttooling.com

BR FREZITE – Ferramentas de Corte, Ltda.
Rua Otto Emilio Beckert, 85-C
Boehmerwald · São Bento do Sul
SC CEP: 89287-665
T. +55 (47) 3635 2065/66
F. +55 (47) 3635 2067
comercial.brasil@frezite.com
www.frezite.com.br

FI Teratoimitus Salonen Oy
Vipusenkatu 17
15230 Lahti
T. +358 207 999 862
F. +358 207 999 868
jarmo.lehtinen@teratoimitus.fi
www.teratoimitus.fi

CZ FREZITE, s.r.o.
Textilní 1278
506 01 Jičín
Czech Republic
T. +420 491 513 97- 1/2/3
F. +420 491 513 970
obchod@frezite.cz
www.frezite.cz

DE FMT – Frezite Metal Tooling, GmbH
Lange Straße 66
72336 Balingen
T. +49 7433 / 99741-0
F. +49 7433 / 99741-25
info.de@fmttooling.de
www.fmttooling.com

UK FMT Tooling Systems Limited
14b Orgreave Close
Handsworth Industrial Estate
Handsworth Sheffield S13 9NP
T. +44 (0) 114 352 0298
F. +44 (0) 114 288 9212
office@fmttooling.co.uk
www.fmttooling.co.uk

RO FMT Romania
Calea Turzii, nr 227, Ap 55
Cluj Napoca, Romania
T. +40 731 894 550
info.ro@fmttooling.com
www.fmttooling.com

PL FMT Tooling Systems Sp. z o.o.
ul. Klimasa 4
50-515 Wroclaw
T. +48 71 3907571
F. +48 71 3907571
bau@fmttooling.pl
www.fmttooling.pl

MX Frezite Metal Tooling S. de R.L. de C.V.
Km 2-200 lateral carretera Estatal 431
Colonia: Parque Tecnológico Innovación
Queretaro, Lote 27, Bodega 4
CP: El Márquez, Queretaro de Arteaga.
T. +52 (222) 245 4875/+52 (222) 604 7741
info.mx@fmttooling.com

Sales Office:
Andador Gabino Barreda A, No. 110-1
Colonia: Concepción Guadalupe
CP:72820 San Andres Cholula, Puebla