DIXI polytool

PCD AND DIAMOND TOOLS

DIXI POLYTOOL S.A.

COMPANY PROFILE

DIXI Polytool S.A. is a company based in Le Locle, Switzerland, that produces tungsten carbide and diamond cutting tools as well as precision reamers. The company was founded in 1946 and has been making investments into its production since then.
DIXI Polytool S.A. has a friendly work environment for its 300 employees and wants to guarantee the quality of its products while preserving the environment by using **ISO 9001** and **ISO 14001** certified management systems.

AN ENVIRONMENTALLY RESPONSIBLE ATTITUDE

A forerunner in this field too, DIXI Polytool SA uses exclusively green energy for all building maintenance and manufacturing operations.

DIXI Polytool is powered 100% green electricity produced exlusively from solar panels and hydrpower station.

KEY FIGURES

60 million CHF sales

35% of special tools

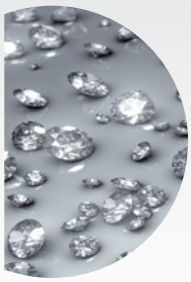
300 employees

140 CNC machines

+ 18'000 standard references in stock

9 subsidiaries in **7** countries

THE MONOCRYSTALLINE DIAMOND

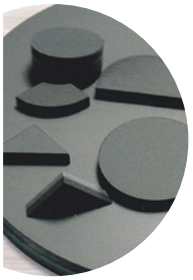


Monocrystalline diamond consists of pure carbon that develops under very high pressure and temperature. Diamond is the hardest known material in the world. Its extremely sharp cutting edges enable a surface roughness Rz of less than 0.02µm. In addition, the very low pressure generated on the tool cutting edge during machining minimises tool wear. Monocrystalline diamond is used for finishing and enables a «mirror polished» surface appearance for non-ferrous materials and a transparent appearance for plastics.

Non-ferrous metals and alloys that can be machined : Platinum, silver, gold, brass, nickel silver, bronze, aluminium, plastics.

Applications : Jewellery, watches, optics, sanitary, luxury goods industry, plastics industry.

PCD POLYCRYSTALLINE DIAMOND



Polycrystalline diamond is a layer of synthetic diamond bonded by a binder (cobalt) and sitting on a carbide support layer. Compared to monocrystalline diamond, PCD has lower wear resistance but better toughness. For an optimal machining result, it is important to choose the right PCD grade. This gives up to 10 times the tool life of carbide tools.

Non-ferrous metals and alloys that can be machined : Graphite, composites, aluminium, plastics, brass, platinum, bronze, nickel silver, glass fiber.

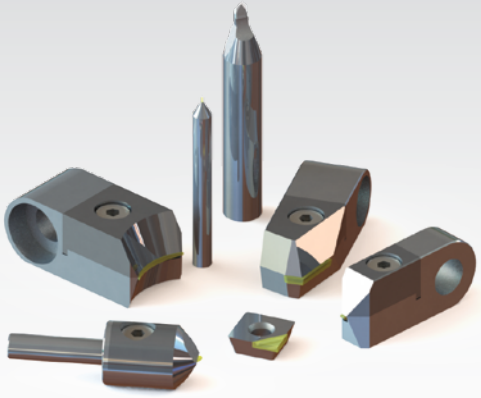
Applications : Jewellery, watches, automotive, aerospace, connectors, eyewear, plastics industry, Medicine.

CVD POLYCRYSTALLINE DIAMOND

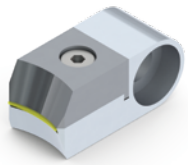
Polycrystalline CVD diamond is characterised by a layer of diamond crystals formed by growth in a vacuum. This cut material has neither a binder nor a carbide underlayer like PCD. As a hard and homogeneous material, CVD has a very fine cutting edge, resulting in a very good surface finish of the final product. The resistance to high temperatures is better than a PCD tool, but CVD is more brittle as it has no shock-absorbing underlayer.

Non-ferrous metals and alloys that can be machined : Graphite, composites, aluminium, plastics, brass, platinum, bronze, nickel silver, glass fiber.

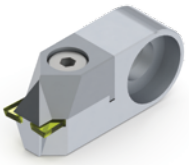
Applications : Jewellery, watches, automotive, aerospace, connectors, eyewear, plastics industry, medicine.



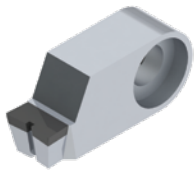
JEWELLERY INDUSTRY



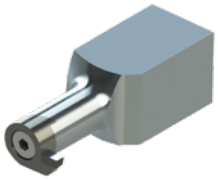
DIXI 20370 DIA
Posalux e=10; R=25



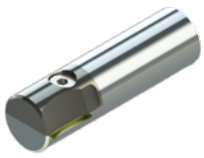
DIXI 20370 DIA
Posalux R/L
e=10; R=18



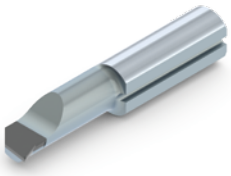
DIXI 20370 PCD
Posalux
e=6; R=2



DIXI 25810 PCD
e=3

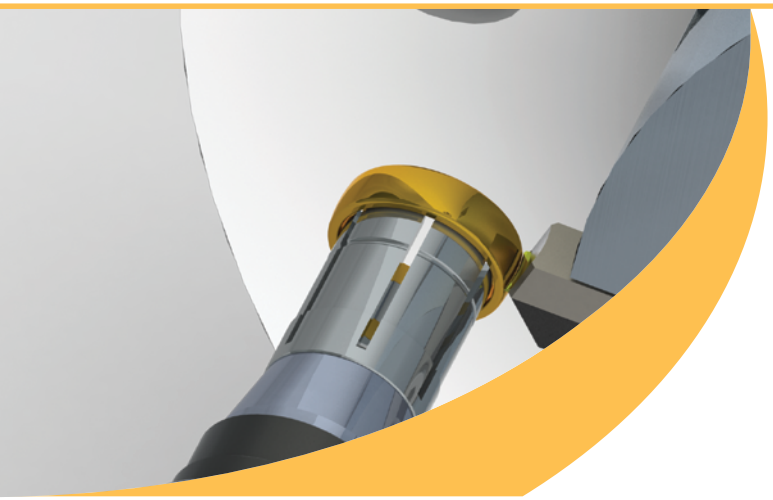


DIXI 25810 DIA
e=10; R=18



DIXI 25810 PCD
e=10; R=18

APPLICATION EXAMPLE: MACHINING THE OUTER SURFACE OF A RING



Goal
Finishing the ring
without manual polishing

Material
Gold 18 carat

Tool
DIXI 20370 DIA
e=8; R=15,5

Machine
Turning centre with
Double spindle
and double revolver

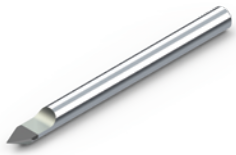
Lubrication
Yes

Cutting values
n = 4.500 rpm
f = 0,005 mm/rev

Result
Mirror polished effect without overlapping marks by using a monocrystalline finishing tool.

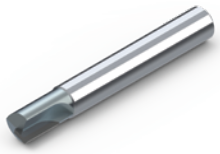
PLASTIC INDUSTRY

DIXI 70320 DIA
Ø3x3xØ6x58 Z=1

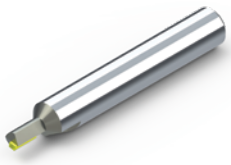


DIXI 70170 PCD
Ø0,1x3xØ6x42/60° Z=1

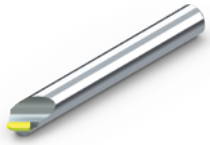
DIXI 81000 Ø 60



DIXI 70630 PCD
Ø4x10xØ6x50 Z=1

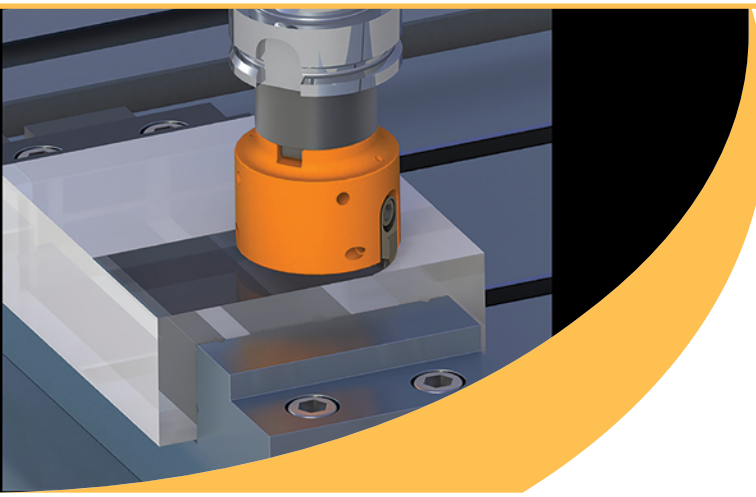


DIXI 70600 DIA
Ø1x2xØ6x42 Z=1



DIXI 70170 DIA
Ø0,1x3xØ6x42/90° Z=1

APPLICATION EXAMPLE: FACE MILLING OF PLASTIC BLOCS



Goal
Avoid light reflections
Transparent surface

Material
PMMA

Tool
DIXI 20370 DIA
mounted on a Ø125mm

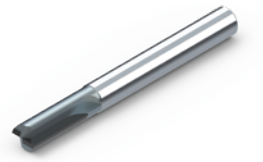
Machine
Face milling machine

Lubrication
Air

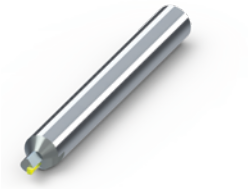
Cutting values
n = 4.000 rpm
V_f = 200 mm/min
a_p = 0,2 mm

Result
With the diamond superfinishing tool we can achieve a clean surface with complete transparency.

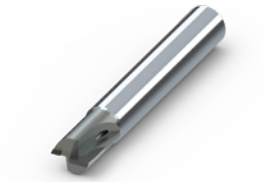
EYEWEAR INDUSTRY



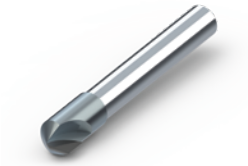
DIXI 72420 PCD
Ø8x16xØ8x58 Z=2



DIXI 72310 PCD
Ø0,5x1xØ3x30 Z=1



DIXI 72420 PCD
Ø6x6xØ8x50 Z=1

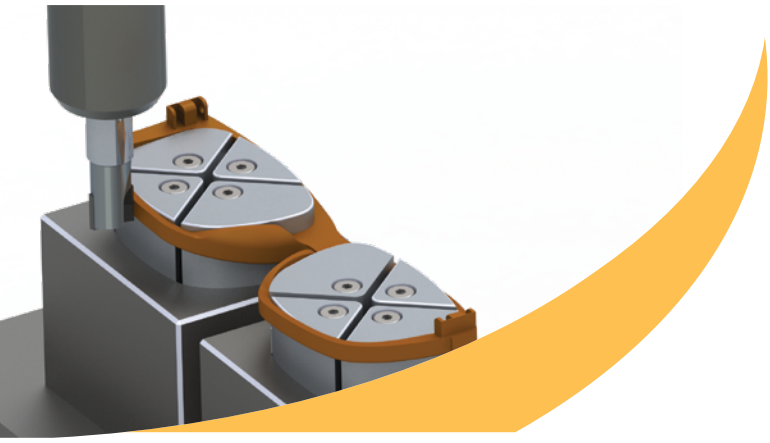


DIXI 70170 PCD
Ø0,2x3xØ6x50 Z=1

DIXI 16500 PCD
Ø27x6xØ 6 Z=7 R=25

DIXI 16500 PCD
Ø27x6xØ6 Z=7 R=10

APPLICATION EXAMPLE : MACHINING OF SPECTACLE FRAMES



Goal
Application example:
Machining of
a spectacle frame

Material
Acetat

Tool
DIXI 72420
Ø8x7x14xØ8x63
Z=2

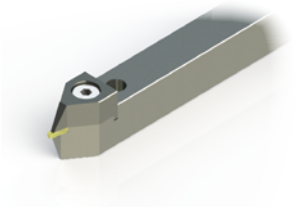
Machine
3-axis
Machining centre

Lubrication
Without

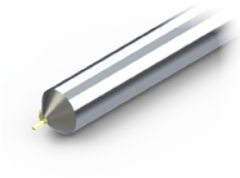
Cutting values
n = 16.500 rpm
V_f = 850 mm/min
a_e = 0,5 mm

Result
The number of parts has been increased by 5 times compared to the previous carbide tool. The surface finish remains intact.

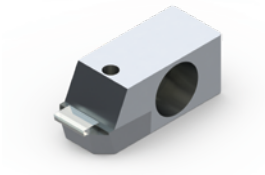
WATCH INDUSTRY



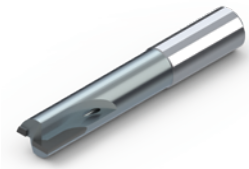
DIXI 20770 DIA
e=0,8; L=1,5
Halter 8x8x80 Z=1 SP



DIXI 72310 DIA
Ø1x2,5xØ3x30 Z=1



DIXI 20370 DIA e=6
Posalux 10x10x26

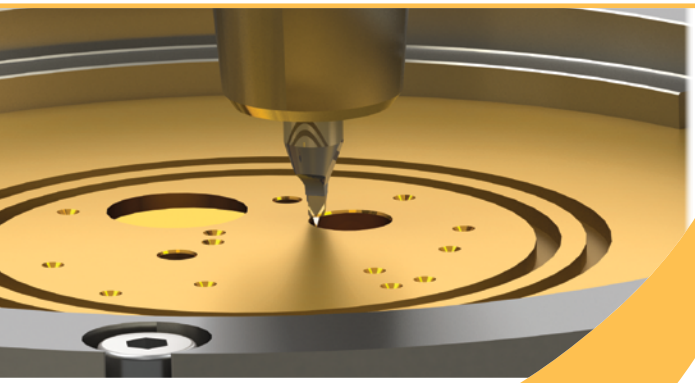


DIXI 72420 PCD
Ø6x8x34xØ6x75 Z=2

DIXI 70170 DIA
D1=0,1 - Ø6x50/60° Z=1

DIXI 70170 PCD
D1=0,05 - Ø6x50/35° Z=1

APPLICATION EXAMPLE: MACHINING OF A WATCH PLATE



Goal
Chamfering of bores

Tool
DIXI 70170 Ø0,05 DIA

Lubrication
Yes

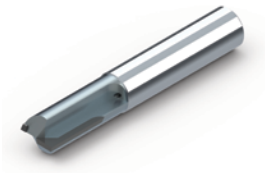
Material
Gold

Machine
3-axis
Machining centre

Cutting values
n = 35.000 rpm
V_f = 65 mm/mm
a_p = 0,05 mm

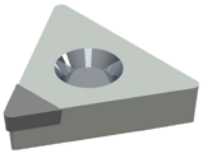
Result
Highly polished finish on the bevel, giving a significant aesthetic effect.

ELECTRODE PRODUCTION

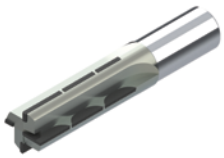


DIXI 72420 PCD
Ø8x20xØ8x58 Z=2

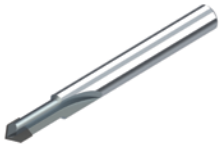
DIXI 70600 PCD
Ø1x3xØ6x38 Z=1



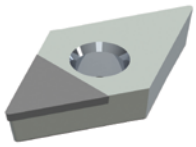
DIXI 26420 TCMW 110204



DIXI 72150 PCD
Ø16x45xØ18x80 Z=4

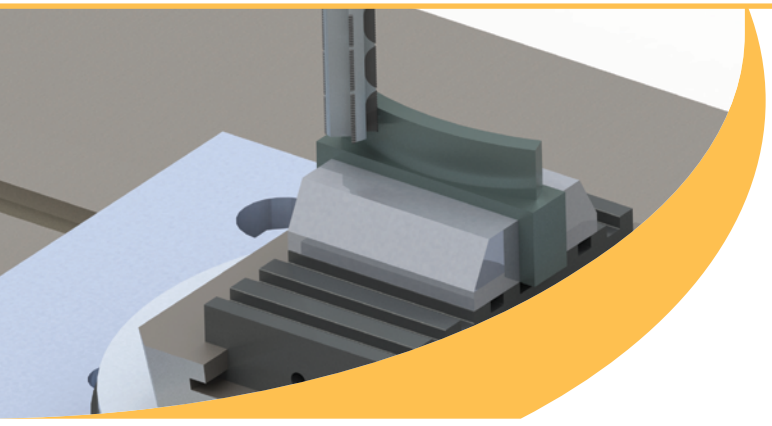


DIXI 11180 PCD
Ø4x12xØ6x38 Z=2



DIXI 26420 DCGW 110202

APPLICATION EXAMPLE: ELECTRODE MACHINING



Goal
Fast roughing with good tool life

Material
Graphite

Tool
DIXI 72150 PCD
Ø20x30x45xØ18x80
Z=4 SP

Machine
5 Axes
Machining centre

Lubrication
Without

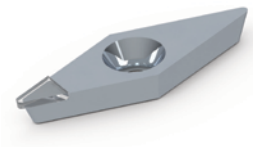
Cutting values
n = 6.500 rpm

V_f = 1.600 mm/min

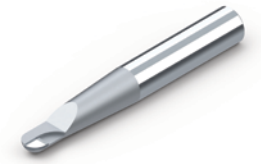
Result
Very low tool wear in complex material due to optimised PCD grade.

MEDICAL TECHNOLOGY

DIXI 72420 PCD
Ø3x15xØ6x55 Z=2



DIXI 26420 DIA
VCGT 110302



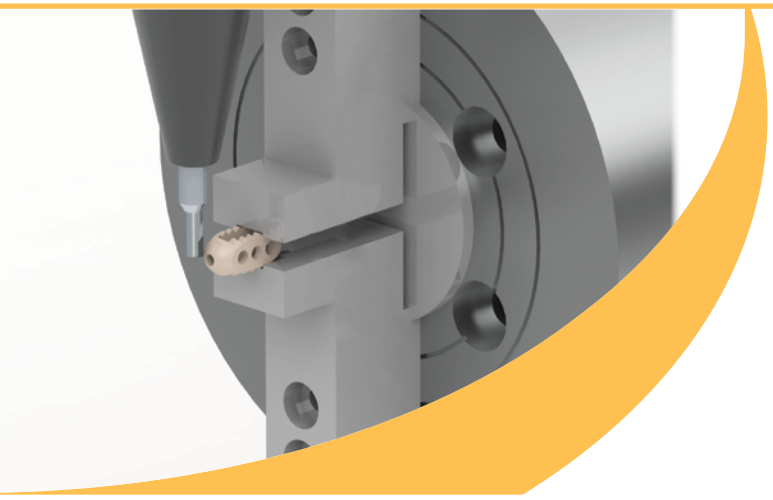
DIXI 70320 DIA
Ø6x3xØ8x60 Z=1

DIXI 72420 PCD
Ø14x20xØ14x70 Z=2

DIXI 17300 PCD
M 2.50x0,45x5.8xØ3x38
Z=1 D1=Ø2

DIXI 72420 PCD
Ø4x8xØ6x58 Z=2

APPLICATION EXAMPLE: SPINAL IMPLANT MACHINING



Goal
Fast roughing of the workpieces while maintaining an acceptable tool life

Material
PEEK

Tool
DIXI 72420 PCD
Ø10x10x20xØ12x60
Z=2 SP

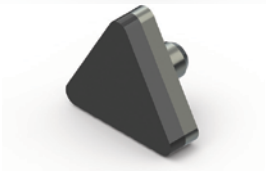
Machine
5-axis CNC milling machine

Lubrication
Without

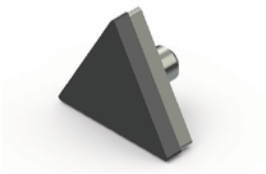
Cutting values
n = 15.500 rpm
V_f = 1.500 mm/min

Result
Very low wear of the cutter in this complex material thanks to the choice of a suitable PCD grade.

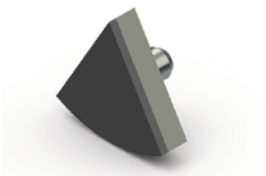
GRINDING



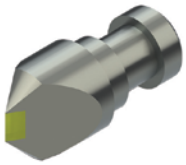
DIXI 1978 2512
R=0,125 CPX
Substrate PCD



DIXI 1978 2500
Substrate PCD



DIXI 1978 23 60°
Substrate PCD

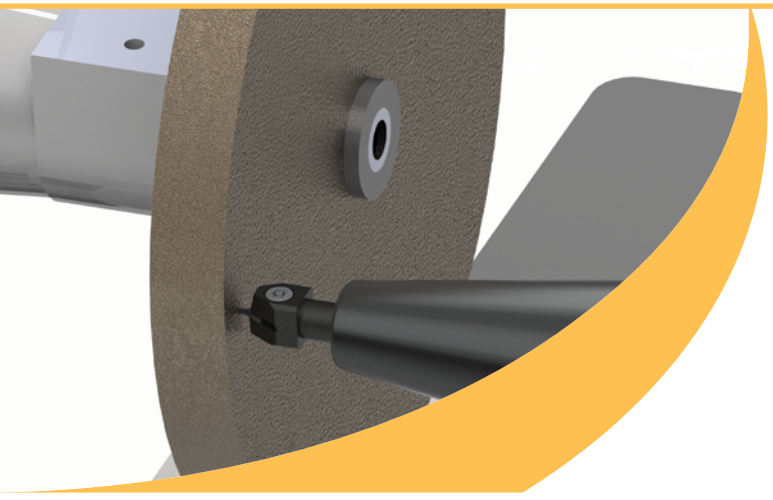


DIXI 06940 DIA
Ø10x7xØ8x21,41

Holder

Holder with plate

APPLICATION EXAMPLE: DRESSING OF GRINDING WHEELS



Goal
Profile dressing of a grinding wheel

Tool
DIXI 1978 2500 PCD

Lubrication
Water-oil emulsion with 2.5% oil

Material
Grinding wheel from aluminium oxide

Machine
Cylindrical grinding machine

Cutting values
Feed rate :
240 mm/min
Rotation of the grinding wheel :
n = 1.000 rpm
a_p = 0,03 mm

Result
Dressing of the grinding wheel with consistent quality.
Low number of passes, improved productivity.

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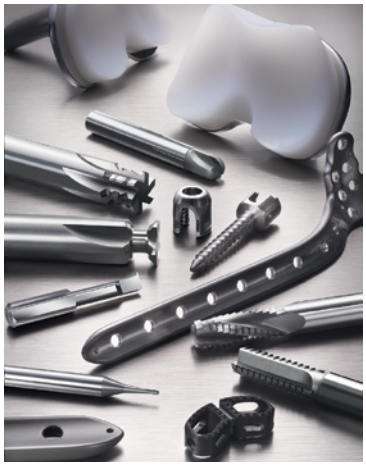




DIXI polytool

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