



**Diamond tools for  
intra-ocular lenses  
and contact lenses**

# Introduction

## **Diatec diamond technology LLC – a partner of the Meyco Diamond Tool Group**

The Meyco Diamond Tool Group has many years of experience in the production of very different diamond tools and other diamond products.

As a partner of world-renowned watchmakers has Meyco to meet highest quality requirements on a daily basis. Such challenges can only be mastered with carefully trained personnel and state-of-the-art machinery.

In the ophthalmology sector is Meyco known as the manufacturer of Meyco diamond scalpels. Our grinding process, developed over many years, allows to machine 0.1 and 0.2 mm thin scalpels.

We, DiaTec LLC, Pforzheim, Germany, a company of the Meyco Diamond Tool Group, have for some time been providing diamond tools for producing intra-ocular-lenses and contact lenses. Today, our numerous specialists enable the Meyco Group to produce standard and special tools, meeting the highest requirements.

Depending on customer requirements, tools are produced from natural or synthetic diamonds. We are happy to design solutions for special equipment together with our customers.

## Diamond tools for manufacturing intra-ocular lenses and contact lenses

DiaTec offers a complete range of diamond tools for machining intra-ocular lenses and contact lenses

The tools are varying as follows:

- insert system/solid shank
- natural diamond/synthetic single crystal diamond
- controlled waviness tool/standard tool
- cylindrical clearance/conical clearance
- shank: according to make of lathe
- radius size
- rake

### **Diamond material: synthetic or natural single crystal diamond?**

Tools using natural or single crystal diamonds are available. Both types offer certain advantages depending on the application. The lens material to be machined and the geometry of the tool are decisive for selecting the correct diamond.

The diamonds known as **Mono Die** or **Sumitomo** are artificially produced. They are made from a high-quality diamond material and are used for working on non-metallic materials.

We are happy to assist our clients with determining the most suitable specification.

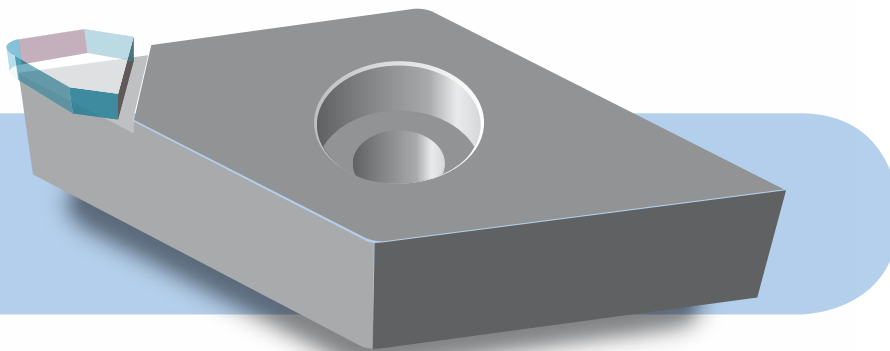
## Standard Radius Tools

Standard tools contain a considerable amount of waviness. These tools are less expensive and are generally used for roughing operations, where less precision is required.

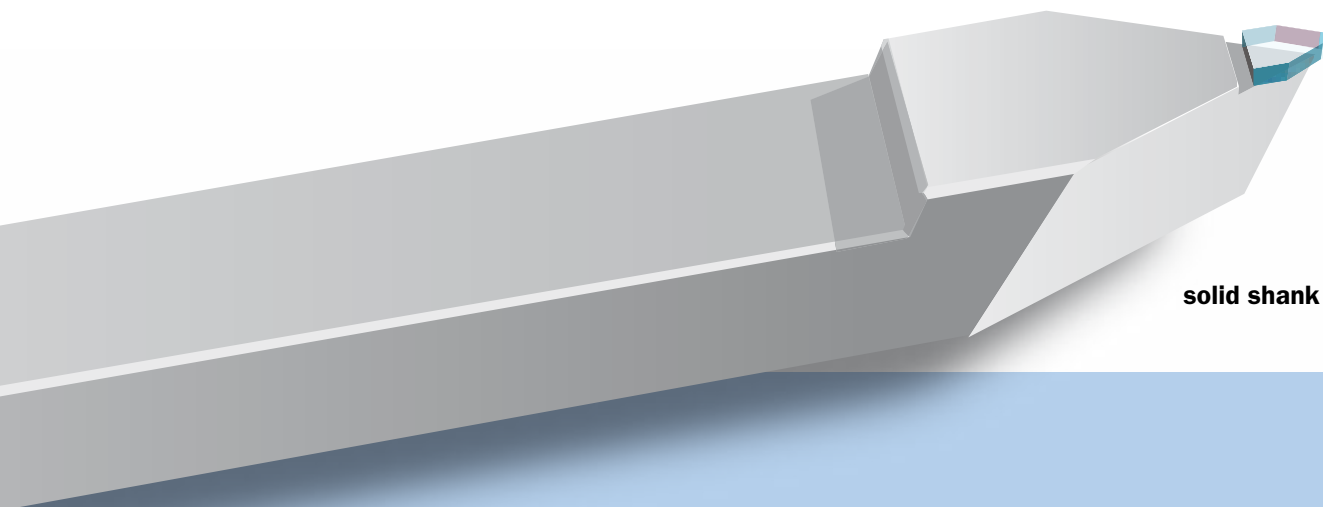
The standard tools are also inspected using 500x Normanski optics and show no sign of chipping at this magnification.

The standard radius tools are available as solid shank or insert tools:

**insert tool**



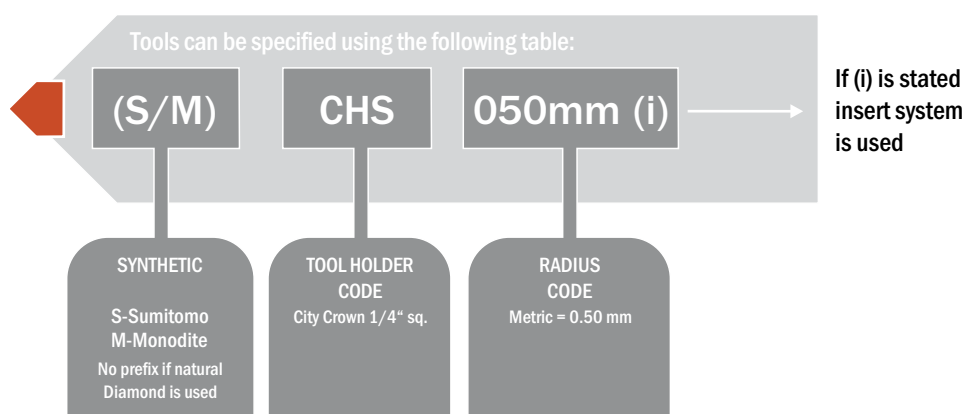
**solid shank tool**



make of lathe	shank	code	special	PMMA & RGP	hydrophillic non-brittle	hydrophillic brittle
			0.25mm	0.50mm	0.75mm	1.0mm
CHASE +5° toolholder	6.35mm sq.	CHS	CHS025	CHS050	CHS075	CHS100
CHASE (parallel toolholder)	6.35mm sq.	CHSP	CHSP025	CHSP050	CHSP075	CHSP100
CITY CROWN	6.35mm sq.	CI	CI025	CI050	CI075	CI100
CITY CROWN	6.35mm sq. + 19mm step	CIR	CIR025	CIR050	CIR075	CIR100
CITY CROWN	8.0mm x 6.35mm	CITR	CITR025	CITR050	CITR075	CITR100
COBURN 800	6.35mm sq.	CO	CO025	CO050	CO075	CO100
DAC	6.35mm sq.	DAJ	DAJ025	DAJ050	DAJ075	DAJ100
DAC	7.5mm x 6.35mm	DAJB	DAJB025	DAJB050	DAJB075	DAJB100
DAC	8.0mm sq.	DAJC	DAJC025	DAJC050	DAJC075	DACJ100
DAC	8.0mm sq. x offset left	DAJCL	DAJCL025	DAJCL050	DAJCL075	DACJ100
DAC	8.0mm sq. x offset right	DAJCR	DAJCR025	DAJCR050	DAJCR075	DAJCR100
GFELLER	8.0mm sq.	GF	GF025	GF050	GF075	GF100
MICROTURN	6.35mm sq	MI	MI025	MI050	MI075	MI100
NISSEL (17° toolholder)	5.0mm sq.	NIA	NIA025	NIA050	NIA075	NIA100
NISSEL (parallel toolholder)	5.0mm sq.	NIAP	NIAP025	NIAP050	NIAP075	NIAP100
NISSEL (1/4 sq.)	6.35mm sq.	NIR	NIR025	NIR050	NIR075	NIR100
POLYTECH	6.0mm sq.	POW	POW025	POW050	POW075	POW100

Notice:

The first two letters describe the make of the lathe and the numbers are indicating the radius



## Tools with controlled waviness

DiaTec offers tools with controlled waviness for machining lenses on CNC 2-axes lathes.

The definition of waviness is the amount of deviation from a true circle.

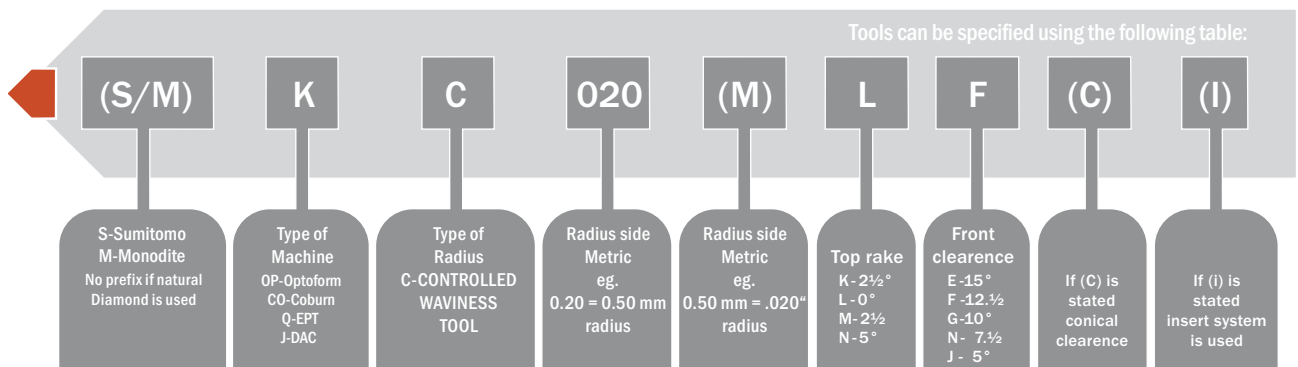
As tools with controlled waviness are considerably more expensive, it is important to also be able to measure the specified waviness. Using the latest generation of measuring equipment, DiaTec can guarantee the specified waviness. The tools are inspected using 800x Normanski optics.

All holders are produced in house.

The tools are offered with the following features:

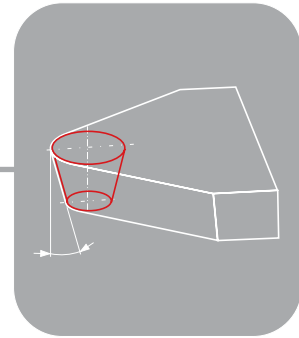
- insert system or solid shank tools
- cylindrical or conical clearance
- natural or single crystal synthetic diamond (see page 2)
- guaranteed waviness of 0.4µm, on request up to 0.05µm
- various geometries (radii of 0.1 – 1.0mm)

### tool specifications



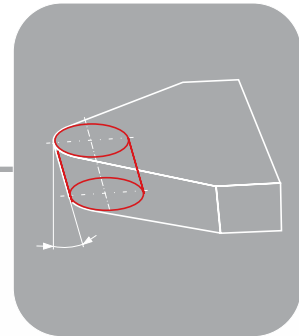
### Clearance

Both conical and cylindrical versions are available in natural or synthetic diamonds.



### Conical clearance

The conical version features a circular edge within a guaranteed tolerance of  $0.2\mu\text{m}$ . The tools can be produced with radii of  $0.1 - 1.0\text{mm}$ .



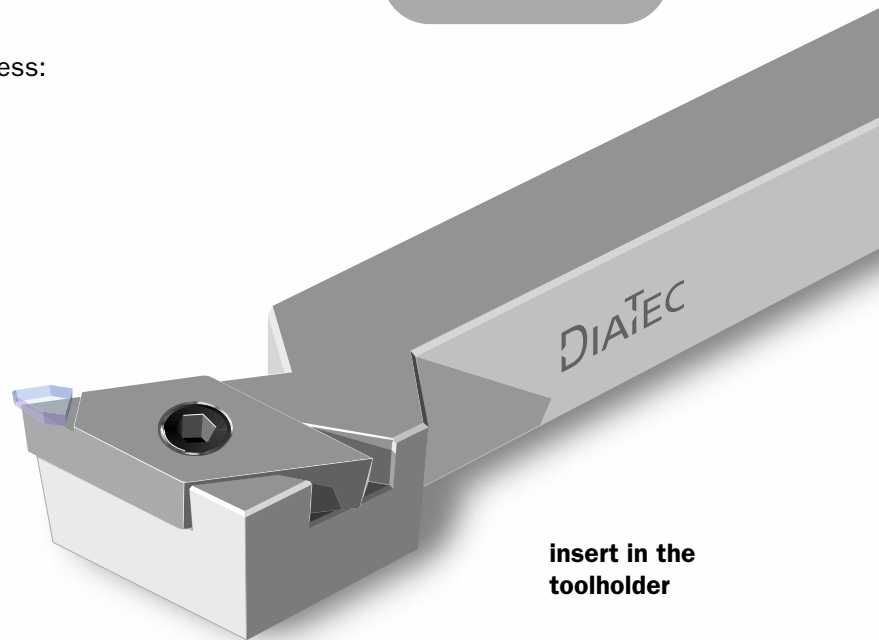
### Cylindrical clearance

Cylindrical tools have an elliptical shape proportional to the size of the radius, clearance and rake.

### Controlled waviness

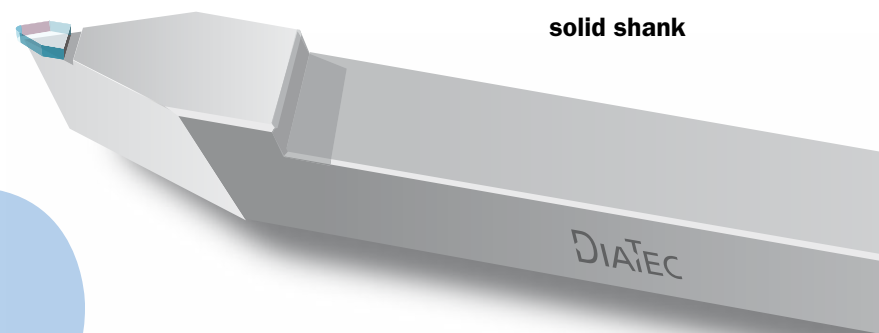
DiaTec offers the following controlled waviness:

- $<1.0\mu\text{m}$
- $<0.75\mu\text{m}$
- $<0.5\mu\text{m}$
- $<0.25\mu\text{m}$
- $<0.15\mu\text{m}$
- $<0.1\mu\text{m}$
- $<0.05\mu\text{m}$   
(less than 50 nanometers)



insert in the toolholder

### Inspected using 800x Normanski optics

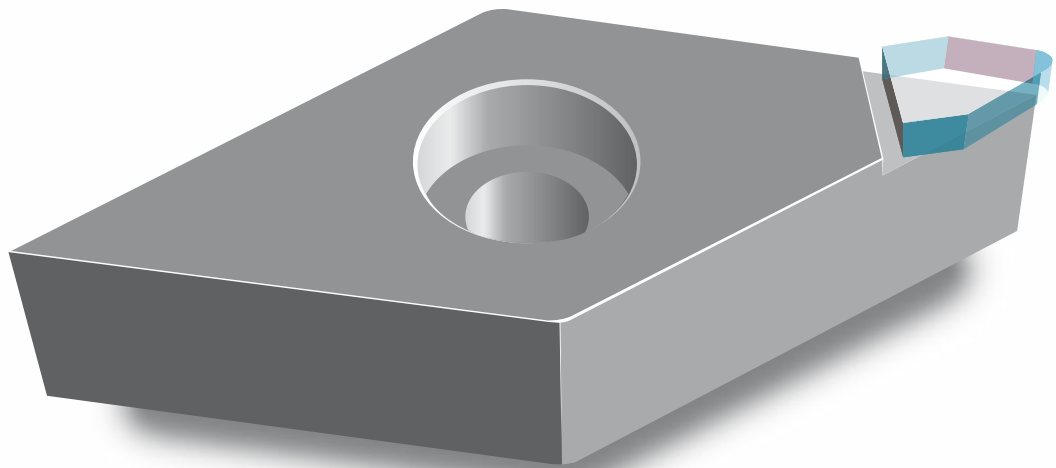


solid shank

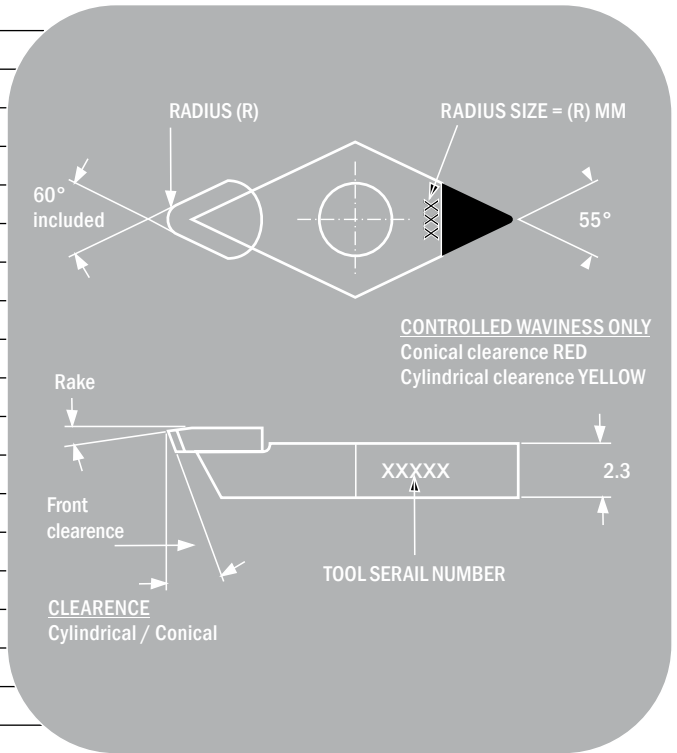
## The insert tools

Insert tools are offered in cylindrical or conical shape with or without controlled waviness and with a natural or single crystal synthetic diamond.

The diamond is attached to the holder using high-vacuum brazing.



make of lathe	shank	code
CHASE +5° toolholder	6.35mm sq.	CHS
CHASE (parallel toolholder)	6.35mm sq.	CHSP
CITY CROWN	6.35mm sq.	CI
CITY CROWN	6.35mm sq. + 19mm step	CIR
CITY CROWN	8.0mm x 6.35mm	CITR
COBURN 800	6.35mm sq.	CO
DAC	6.35mm sq.	DAJ
DAC	7.5mm x 6.35mm	DAJB
DAC	8.0mm sq.	DAJC
DAC	8.0mm sq. x offset left	DAJCL
DAC	8.0mm sq. x offset right	DAJCR
GFELLER	8.0mm sq.	GF
MICROTURN	6.35mm sq	MI
NANOTECH	6.35mm sw. X10.5mm C.H.	NAU
POLYTECH	6.0mm sq.	OPQ
PRECITECH / OPTOFORM	6.35mm sw. X10.5mm C.H.	PRK
OPTEQ	8.00mm sq.	POW



**tool insert numbering system**

	special application	PMMA & RGP	hydrophillic non-brittle	hydrophillic brittle
radius	cw0.25mm	cw0.50mm	cw0.75mm	cw1.0mm

## Toric Fly-Cutting tools

«FLY Cutters» are used on different lathes for machining contact lenses. Once adapted to the lathes, toric geometries can be produced by fly cutting.

As part of this process, the tool rotates swung out of its spindle axis to create a meridian, whilst the workpiece is turned away from the axis on the lathes quadrant in order to create the second meridian.

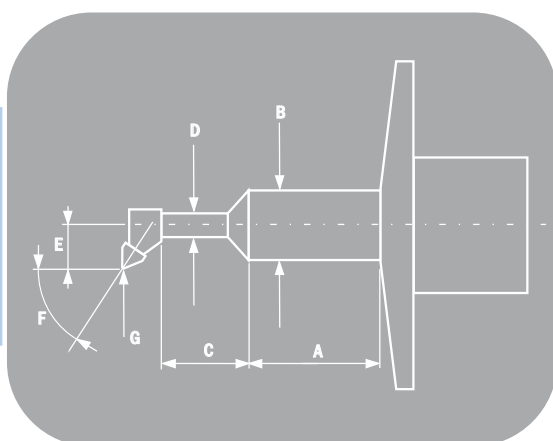
The toric tools are supplied ready for installation on the machine. The typical radius for these tools equipped with a natural diamond is 0.5 mm and they can be supplied with nearly any offset of your choice.

**When ordering toric tools for City Crown or Gfeller, please specify the following (example):**

Late Type	Ref.	Example
City Crown		
c to diamond tip (xx)	E	6.5mm
Offset angle (xx°)	F	30°
Radius size	G	0.5mm

**When ordering toric tools for DAC lathes, please specify the following:**

Late Type	Ref.	Example
DAC		
Large shaft length	A	12.0mm
Large shaft diameter	B	8.0mm
Small shaft length	C	11.5mm
Small shaft diameter	D	3.5mm
c to diamond tip (x.x)	E	6.5mm
Offset angle (xx°)	F	30°
Radius size	G	0.5mm



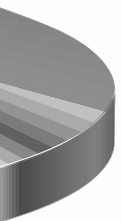
## Repair Service

DiaTec offers a fast and economical service for regrinding its own or third-party diamond tools.

## Technical Support

DiaTec provides tools for testing.

Tests establish the correct tool configuration as regards diamond material, radius, clearance, rake and waviness.





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