TECHNODIAMANT

Established since 1968



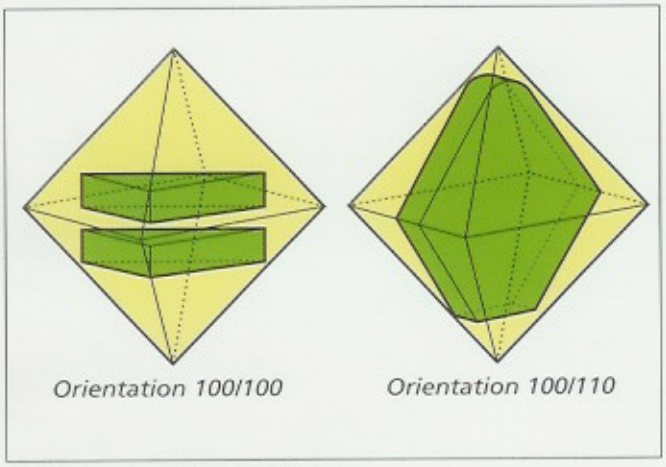
Diamond Cutting Tools

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Diamond cutting tools

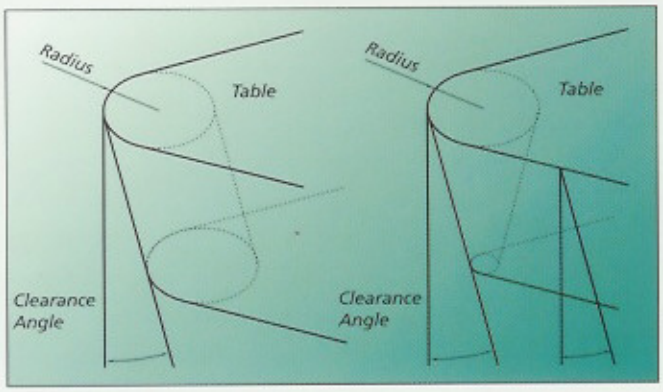
Technodiamant manufactures a full range of synthetic and natural diamond tools for many industries.
Our tools are used particularly in the optical industry. The successful production of many complex optical products depends on both good machinery and reliably precise diamond tools.

The combination of the selected diamond (natural and mono crystalline synthetic), together with the chosen orientation, is the basis of a good diamond tool.



Some possible orientations

Technodiamant therefore developed a consistent production process to not only optimize the choice of diamond but, just as important, to guarantee the best possible surface finish both of the top rake face and on the front clearance.



Differences between conical and cylindrical clearances.

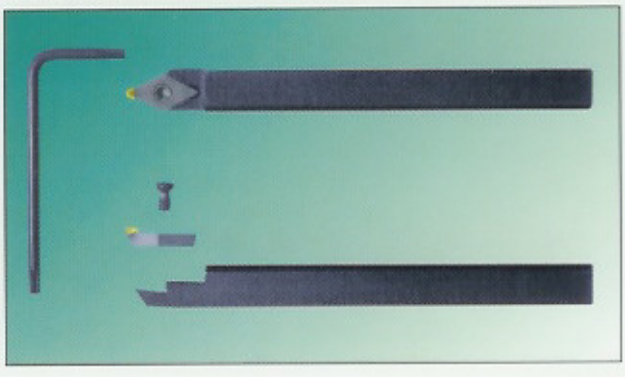
Production method

Instead of following other manufacturers in their production method, Technodiamant developed an entirely new concept for polishing the radius of the tools.
The polishing machines developed by Technodiamant are equipped with a highly sophisticated bearing system, which enables Technodiamant to produce controlled waviness tools with a waviness up to 0,05 µm. Each radius can be manufactured with either a conical or a cylindrical clearance angle.

At the same time, Technodiamant has improved the lapping and relapping facilities by using a fully automated system. This system ensures, in combination with the conical clearance angle, an absolute circle instead of an ellipse.
Technodiamant guarantees the sharpness of their tools, both controlled and non-controlled waviness, with a clean edge, observable at a magnification of 600x.

Diamond tool insert system

Technodiamant not only manufactures diamond tools with rigid shanks, it also introduced the diamond tool insert system to the contact lens industry many years ago. Nowadays this system is in wide use throughout the world.
The diamond is vacuum brazed onto the insert and the insert fitted to the specified tool holder.

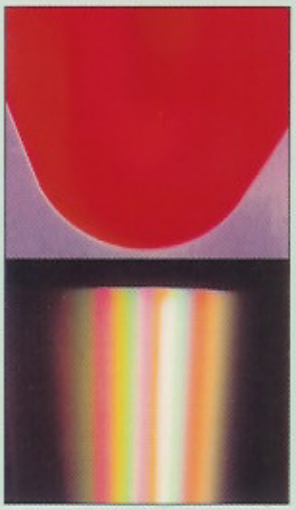


Tool holders are available with straight and off-set angles.

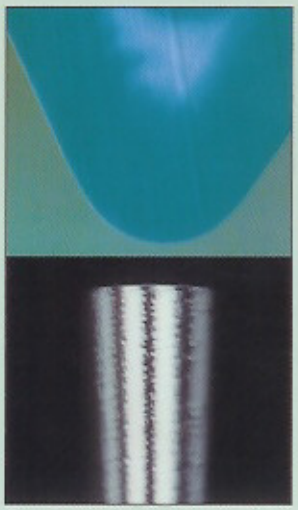
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Measuring

Distinguishing differences in tool quality is very difficult. A high quality tool should have a smooth radius and an excellent surface finish on the front clearance. The cutting area on the top rake face should be free of polishing lines. This combination is achieved by Technodiamant, enabling us to produce chip free cutting edges, with an observable sharpness at a magnification of even 1000x.



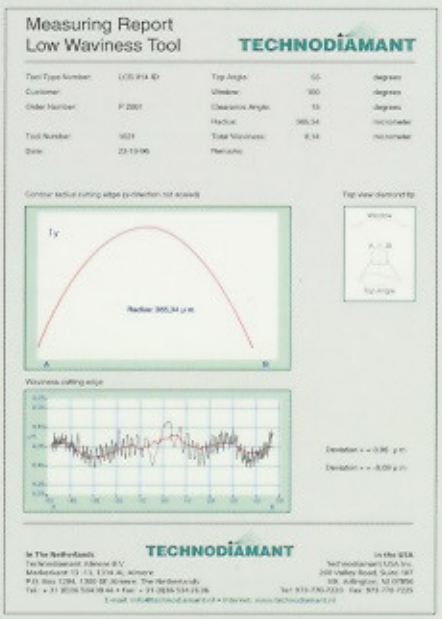
Good quality diamond tool seen on top and front of the diamond smooth faces without polishing lines



Poor quality diamond tool polishing lines on top of the diamond and a bad clearance face

The measuring report below shows that the window (arc)of the measured radius is determined between A and B. Of course it is possible to measure any size window. Normally the size of the window is 100° or 120°. Technodiamant can also prove , by using an interference microscope, that the top rake face and the clearance face are free of polishing grooves *(see photograph).*

In order to measure the radius of the diamond tool after finishing, Technodiamant developed a completely new measuring system. This system makes contacting the radius with a measuring device redundant. It is now possible to measure the waviness of the radius and the radius size at the same time to an extremely high accuracy without the risk of damaging the cutting edge.


Measuring Report
Low Waviness Tool
TECHNODIAMANT

All Technodiamant Controlled Waviness Tools are supplied with a measuring report.

IOL Milling and Drilling Tools

Technodiamant supplies extraordinarily small single crystal diamond tools for machining Intra Ocular Lenses. Milling tools with a flat tip and drilling tools with an extra facet at the tip of the diamond are available in sizes down to as small as 0.3 mm diameter. These tools can be provided with holder diameters of 2.5 - 3.0 and 3.175 mm. The tools are used for machining a wide range of polymers. It is extremely important to have a stable milling machine, preferably with 6-8 jaw collet. The higher the machining speed the better; for example, 80.000 RPM produces quality results.
Many thousands of IOL's can be machined using these tools.



Some possible diamond tool configurations

Typical Materials	TIP Radius in MM	Rake Angle	Clearance Angle
Soft Metals, *Aluminum, copper etc.*	0,5 - 2,5	0° to +5°	6° - 10°
Hard Metals, *Electroless nickel, beryllium copper etc.*	0,2 - 2,0	0° to -10°	6° - 8°
Plastics, *Polycarbonate pmma etc.*	0,25 - 0,75	+3° to -3°	8° - 15°
Crystalline mtrls, *Germanium, silicon etc.*	0,25 - 1,5	-15° to -45°	6° - 8°
Amorphus mtrls, *Zincselinide, Zincsulfide*	0,5 - 3,0	-10° to -25°	6° - 10°

A wide range of toolgeometries can be manufactured.