

Diamond tools for Electro Optics



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Technodiamant Precision Tooling has developed a complete range of tools to meet the requirements of today's electro optics manufacturers. For optimum cutting efficiency the correct tool geometry and diamond material must be used for any given material. Available with either natural or synthetic single crystal diamond, a range of radius size and rake angle is offered. Tools can either be solid shank or insert style. Technodiamant orientates the diamond to maximise the wear-resistant characteristics.

POSSIBILITIES

- Diffractive tools
- Fresnel tools
- Facet tools
- Milling tools
- Form tools
- Half-radius tools
- Unusual shanks
- ... and many more!

OPTIONS

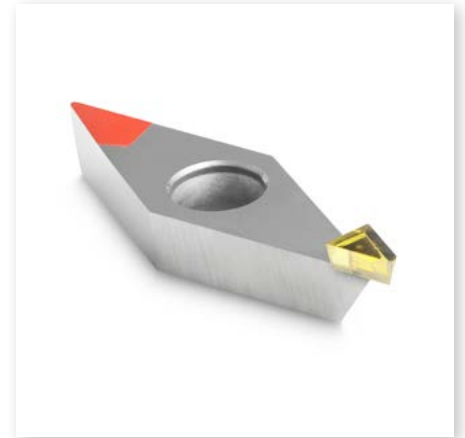
- Natural or synthetic single crystal diamond
- Various geometries
- Solid shank/insert system

FEATURES

- Certificate of conformance
- Chip free at 500x Nomarski
- Guaranteed quality
- Optimum tool life

Pre-finishing & Single Axis turning tools

These tools can be supplied in the same geometry as the required finishing tool. But having a more open tolerance on radius shape (controlled waviness is only necessary on the finishing tool) it is an economical tool for bulk removal of material prior to finishing for two axis applications.



Fly-cutting

Characteristics of these tools are a cylindrical clearance and a larger radius. Since the point of contact between the tool and the work piece remain static, a larger radius can be used to give benefits in surface texture.



Controlled-waviness

Technodiamant Precision Tooling is a pioneer in the development and manufacture of controlled waviness tools.

We have developed a wide range of tools, which are available with conical or cylindrical clearance. "Controlled waviness" dictates that the radius shape deviates from a true circle by a guaranteed value. The standard waviness value for Electro-Optics tools is $<0.5\mu\text{m}$. However, Technodiamant Precision Tooling can offer an extensive range from $<1.0\mu\text{m}$ down to $<0.05\mu\text{m}$

These tools come complete with a 'controlled-waviness' certificate showing the actual radius size, amount of arc, shape and deviation value, measured 'peak to valley' (not averaged). They are available with natural or synthetic single crystal diamond and with the traditional solid shank or the insert system.

When using an ultra precision two-axis machining method, the type of tool utilised requires careful consideration. Final work piece accuracy is dictated by several error sources, including the machine's inherent precision, fixturing, tool setting, environmental conditions, and tool waviness. While many error sources remain more random in nature, Technodiamant Precision Tooling is able to provide predictably high accuracy controlled waviness tools that eliminate that source of error, allowing to focus on other aspects of process optimisation. In addition, production costs can be dramatically reduced by effective tool selection, usage and planning.



Monocrystal Diamond Cutting Tools with Concave Radius

The production of optical quality convex Lenticular structures has long been a challenging endeavour. Methods adopted have ranged from contouring the forms using extremely small radius diamond tools, to electroforming processes that work from the reverse concave form.

Technodiamant provides an alternative solution in the form of concave diamond tools. Non controlled and controlled tools are available with waviness as low as 30-50nm, in a range of radius sizes from 280 μ m to over 200mm, typical window of tool sweep is 80° - 100° or 120° in some cases. Of course on very large radius sizes the tool sweep will be limited by the width of the diamond.

The Included angle of the tool can also be customer specific. These innovative tools can be used in various processes that include raster flycutting and ruling. In addition large format drums can be machined by either continuous spiral or individual plunge cuts. Our support of these advanced manufacturing technologies has helped to fuel the further proliferation of Lenticular optical structures, in for example Brightness Enhancement Film and 3D television applications.





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