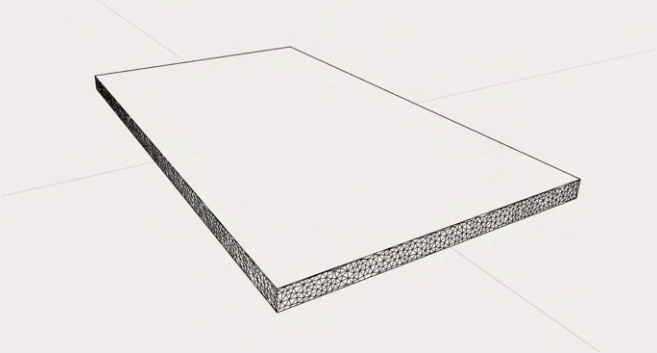
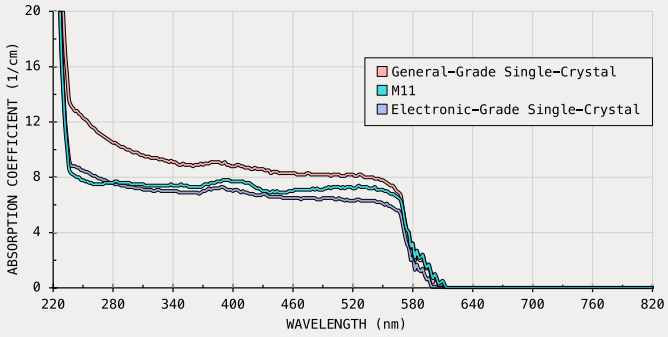
NORTHERN CARBON

M11 Specification

BETA-RELEASE[1]



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M11 (Monocrystalline11) is a plate of type IIa single-crystal diamond with both major surfaces in a (111) crystallographic orientation.

Compared with a standard (100) surface, a (111) surface offers the following advantages:

The greater atomic density of a (111) surface enhances mechanical hardness and chemical oxidation resistance.

NV centers prefer to align with the (111) axis, improving the consistency of NV center readouts in applications such as quantum sensing, photon collection, and magnetometry.

A (111) surface reflects X-rays with greater intensity than the surface-parallel reflection from a (100) surface, making the (111) orientation attractive for high-flux X-ray monochromators.

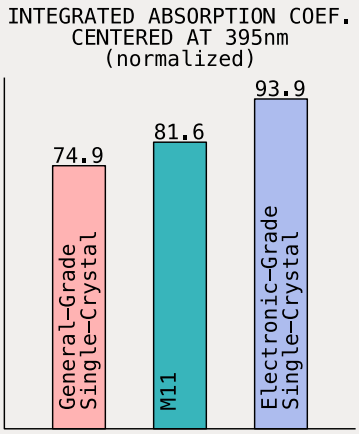
M11 exhibits exceptional isotropic thermal conductivity. As shown in the appended spectrum, M11's transparency in near and far ultraviolet is outstanding.

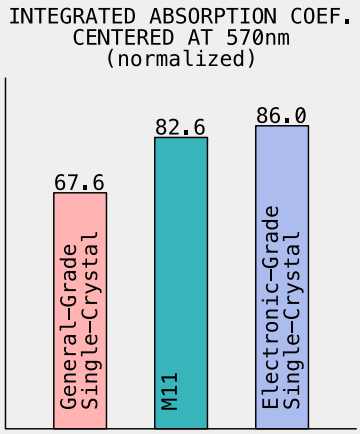
M11 is suited for applications demanding the special mechanical, optical, or quantum properties of (111).

Composition	
crystallinity	one continuous crystal of IIa diamond
orientation	(111) to within 0.3°
mfg.	microwave plasma CVD
% nitrogen	< 150 parts per billion
% boron	< 20 parts per billion
thermal conductivity (κ)	> 2200 W/(m–K) @ 20°C in x, y, and z

Shape	
length	a/o (2–10mm ± 30µm)
width	a/o (2–6mm ± 30µm)
diameter	a/o (2–6mm ± 30µm)
thickness	a/o (250–400mm ± 25µm)
parallelism	< 0.5°
kerf	< 2°

Finish	
option	polished + polished
Ra, Sa	< 3nm
flatness	< 2000nm





[1]M11 is in beta-release. Therefore, measured properties of M11 might deviate from this specification, which is subject to revision.