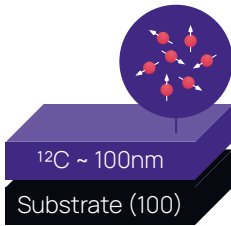


Ensemble NVs

SPECIFICATIONS



¹²C enrichment
0.1% – 99.99%

Layer thickness
0.02µm – 5µm

Overall diamond thickness
20µm – 500µm

NV layer thickness
1nm-5µm

Ensemble NV centers, mainly for magnetometry applications, are extremely popular at the moment. Due to the summed optical signal of the individual defect centers, detection in the component of a quantum sensor or computer is comparatively simple. In addition, the sensitivity is enhanced because the number of possible quantum sensors is automatically increased. NV rich layers up to 2ppm in density can be positioned close to the diamond surface or buried deeper in the diamond crystal. Alternatively, the entire diamond can be equipped with NV centers, providing the highest optical intensity available in diamond quantum technology.

CORE PROPERTIES

	A	B
NV Density	10ppb	1ppm
Depth of NVs	5nm	100nm
T2 (Hahn echo)	1µs	0.8µs
T2*(Ramsey)	120ns	100ns

POSSIBLE NV-POSITIONS

At surface

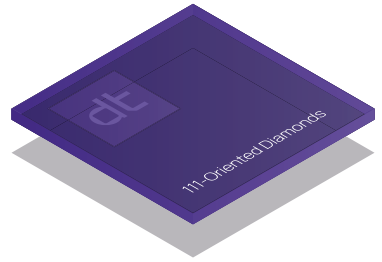


Buried in diamond



Entire diamond

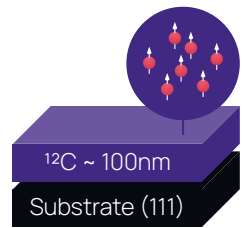




(111) Oriented Diamonds

The usage of (111) oriented diamond crystal offers the advantage, that in-grown NV centers are all pointing in the same direction. So, instead of four differently oriented NV groups, which is the case in (100) oriented diamonds, here only one is present. For this reason, the signal, which carries the magnetic information, and therefore the sensitivity, are four times higher. Such preferentially-aligned NV center ensembles can be produced in several densities up to 2 ppm in layer thicknesses between 20nm-10µm. They can be positioned either close to the diamond surface or buried deeper in the diamond.

SPECIFICATIONS



¹²C enrichment
0.1% – 99.99%

Layer thickness
0.02µm – 2 µm

Overall diamond thickness
20µm – 500µm

NV layer thickness
1nm-1µm

POSSIBLE NV-POSITIONS

At surface



Buried in diamond



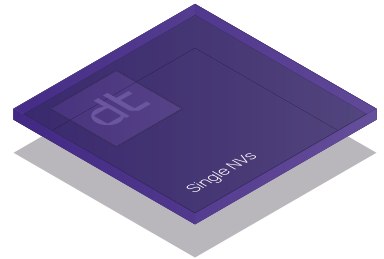
No NVs



CORE PROPERTIES

	A	B
NV Density	10ppb	1ppm
Depth of NVs	5nm	100nm
T2 (Hahn echo)	1µs	0.8µs
T2*(Ramsey)	120ns	100ns

Single NVs

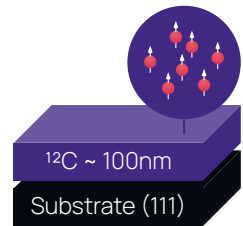


Single NV centers are produced by low energy ion implantation or soft nitrogen doping during CVD diamond growth, followed by a high temperature annealing step.

Single NV centers can be produced in close proximity to the diamond surface (2-5nm) or deeper in the diamond (up to 100nm). The isotopic composition of the surrounding diamond matrix can be tailored to meet customer needs.

Such diamonds can be used for quantum computing applications, when NVs are deep in the diamond, or quantum sensing of quantities outside of the diamond, which can be measured with very high spatial resolution.

SPECIFICATIONS



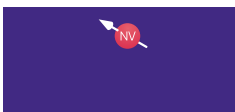
¹²C enrichment
0.1% – 99.99%

Layer thickness
0.02μm – 0.3μm

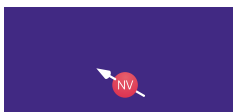
Overall diamond thickness
20μm – 500μm

POSSIBLE NV-POSITIONS

At surface



Buried in diamond



CORE PROPERTIES

	A	B
Depth of NVs	5nm	100nm
T2 (Hahn echo)	10μs	400μs
T2*(Ramsey)	1μs	10μs