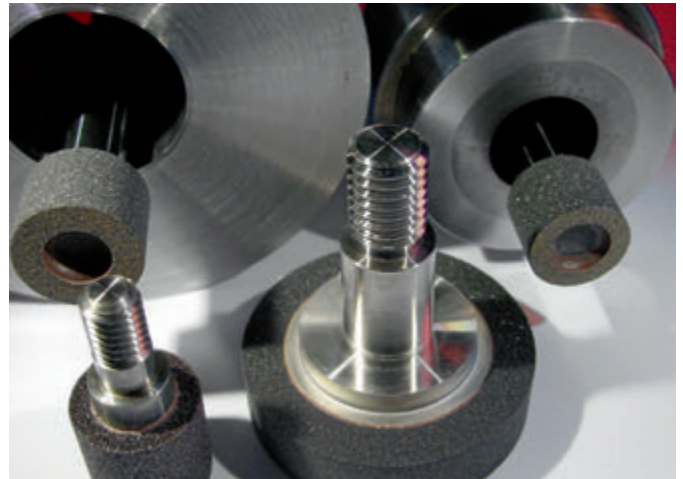


# CBN- and diamond tools for precision machining

356 Technical Information

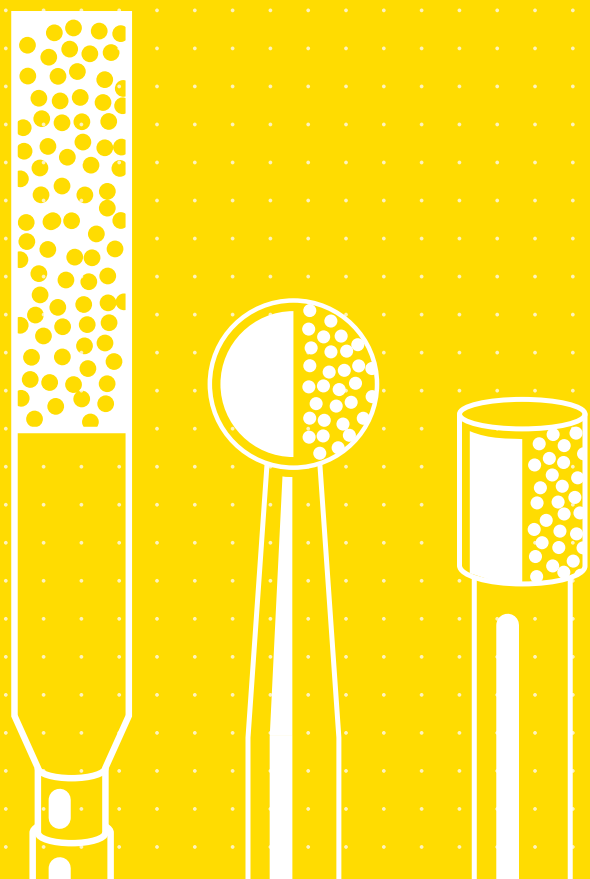
359 CBN/Diamond Grinding Tools, vitrified bonded

365 CBN/Diamond Grinding Tools, electro-plated



## Product line marking

Product lines are labelled in the table header with the appropriate tabs. Further information on page **14** and **15**.



## Technical information

### General

The product group which includes CBN and diamond tools for precision machining is of ever increasing importance in relation to tools consisting of the usual grain types i.e. aluminium oxide and silicon carbide and their further developments e.g. zirconia, mono-crystal and SOL-GEL (SG grain). These super hard grain types include natural and synthetic diamond in „D“ and synthetic cubic boron nitride (CBN) „B“.

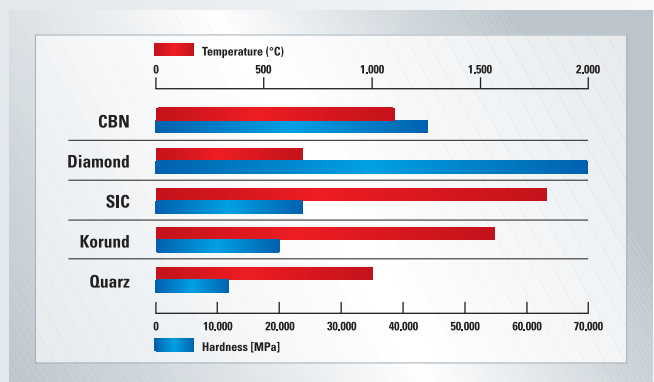
Diamond is used for a wide range of hard materials (except steel), eg, carbides, oxides, nitrides and even diamond itself. Various types of plastic and rubber can also be economically machined.

### Hardness

The ultrahard grain is considerably more expensive than conventional abrasive. Due to the extreme hardness, greater performance can be achieved when used in conjunction with modern manufacturing techniques; this can produce significant cost reductions.

### Micro-Hardness – Temperature stability

The extreme differences in micro-hardness can be identified in the adjoining diagram.



## Technical Information

### Bond

The following bondings are used in the manufacture of LUKAS CBN and diamond tools:

### Vitrified bond

Due to the substantial layer of usable abrasive, vitrified bonded wheels give long tool life. They can be easily dressed and require little grinding pressure. These tools are manufactured in a variety of dimensions and in different structures. They must be used with coolant. A fine surface finish can be achieved.

### Electro-Plated

An electro-plated bond provides a low cost tool. Electro-plating allows the manufacture of a large variety of profiles. They can be used wet or dry; coolant improves tool life.

### Types of grain

Basically, we must differentiate between mono and polycrystalline types of grain. In the case of diamond, it must also be decided whether to use natural or synthetic types. Many applications require a grain coating of nickel or titanium. The physical and chemical properties, including the shape of individual grit particles,

are the decisive factors when selecting the most suitable grit type. LUKAS vitrified bonded CBN-/diamond tools are identified by a quality code which contains all data determining the specification. The customer also receives this basic information regarding grit size and CBN-/diamond concentration.

Based on ISO 6106 and the corresponding FEPA standard, the grit sizes have been categorized as stated below. Contrary to the grit size classification of conventional grain, cubic-boron nitride and diamond grain are specified based on the following: the smaller the number, the finer the grit – the larger the number, the coarser the grit.

The prefix "B" specifies CBN, the prefix "D" denotes Diamond; the US equivalents in Standard Mesh are also shown below.

## Grit Size based on ISO 6106 resp. FEPA and US-Standard

CBN	Diamond	Grit size $\mu\text{m}$	US-Standard Mesh
B 46	D 46	38–45	325/400
B 54	D 54	45–53	270/325
B 64	D 64	53–63	230/270
B 76	D 76	63–75	200/230
B 91	D 91	75–90	170/200
B 107	D 107	90–106	140/170
B 126	D 126	106–125	120/140
B 151	D 151	125–150	100/120
B 181	D 181	150–180	80/100
B 213	D 213	180–212	70/80
B 251	D 251	212–250	60/70

When selecting the grit size, it must be remembered that ultrahard abrasive grain gives a coarser surface finish than conventional grit types; this is due to the extremely low wear rate. The most widely used grit sizes lie between 54 and 91 microns.