PCBN
SBN K-TIP™
cBN Sintered Compacts

SHOWA DENKO K.K.
PCBN

SBN K-TIP™

cBN Sintered Compacts

SBN K-TIP is morphologically featured in that cBN grains constitute
the skeleton with special binders filling voids and creating coherent bonds.
Use of SBN K-TIP is recommended for the purpose of
cutting hard ferrous alloys and difficult to work materials
and for a raw material of wear resistant part.
### Grades, Standard products, Applications

<table>
<thead>
<tr>
<th>Grade</th>
<th>cBN (vol%)</th>
<th>cBN size (µm)</th>
<th>Major Binder</th>
<th>Vickers hardness (GPa)</th>
<th>Transverse rupture strength (MPa)</th>
<th>Ø 29</th>
<th>Ø 60</th>
<th>CUT</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT10</td>
<td>80</td>
<td>3</td>
<td>TiN</td>
<td>32</td>
<td>1000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• High-speed steel and cast iron</td>
</tr>
<tr>
<td>KT10C</td>
<td>80</td>
<td>3</td>
<td>TiC</td>
<td>32</td>
<td>1000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Powdered metal</td>
</tr>
<tr>
<td>KT20C</td>
<td>70</td>
<td>3</td>
<td>TiC</td>
<td>30</td>
<td>950</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Powdered metal and cast iron</td>
</tr>
<tr>
<td>KT25</td>
<td>65</td>
<td>2</td>
<td>TiCN</td>
<td>29</td>
<td>950</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• General-pupose grade for hardened steel and cast iron, having wear resistance and toughness</td>
</tr>
<tr>
<td>KT30</td>
<td>60</td>
<td>3</td>
<td>TiC</td>
<td>29</td>
<td>850</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Finishing hardened steel and cast iron</td>
</tr>
<tr>
<td>KT30N</td>
<td>60</td>
<td>3</td>
<td>TiN</td>
<td>28</td>
<td>850</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Finishing hardened steel</td>
</tr>
<tr>
<td>KT30X</td>
<td>65</td>
<td>1</td>
<td>TiN</td>
<td>28</td>
<td>1300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Interrupted cutting of hardened steel</td>
</tr>
<tr>
<td>KS10</td>
<td>80</td>
<td>3</td>
<td>TiN</td>
<td>32</td>
<td>1000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• High-speed steel and cast iron</td>
</tr>
<tr>
<td>KS25</td>
<td>65</td>
<td>2</td>
<td>TiCN</td>
<td>29</td>
<td>950</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• General-pupose grade for hardened steel and cast iron, having wear resistance and toughness</td>
</tr>
<tr>
<td>KS30X</td>
<td>65</td>
<td>1</td>
<td>TiN</td>
<td>28</td>
<td>1300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>• Interrupted cutting of hardened steel</td>
</tr>
</tbody>
</table>

1. Supported by a layer of cemented carbide, Standard thickness(3.2, 2.5, 1.6mm), PCBN(0.7~1.0mm)
2. A composite consisting of solely sintered cBN, Standard thickness(3.2, 2.5, 1.6mm)
3. The above are representative values not guaranteed ones.

### SBN K-TIP : Application for hardened steel

- KT30: Continuous, Light interrupted
- KT25: Medium interrupted
- KT30X: Heavy interrupted

### SBN K-Tip : Application for cast iron

- KT05Y: KT25 (KT20C): Finish, Semi-Finish, Rough
- KT30 (KT20C): Continuous, Light interrupted
Dimensions and shapes of SBN K-TIP

Round  \( Rn1(n2)a1a2a3t1t2 \)
- \( n \) : divide number  \( a \) : diameter  \( t \) : thickness
- \( R1 \) : circle(\(360^\circ\))  \( R2 \) : semicircle(\(180^\circ\))
- \( R3 \) : round120°  \( R4 \) : round90°
- example : round 360°  diameter Ø60.0mm  thickness 3.2mm  \( \Rightarrow R160032 \)

Square  \( SQ a1a2a3t1t2 \)
- \( a \) : length  \( t \) : thickness
- example : length 13.0mm  thickness 3.2mm  \( \Rightarrow SQ13032 \)

Rectangle  \( La1a2a3(b1)b2b3t1t2 \)
- \( a \) : long length  \( b \) : short length  \( t \) : thickness
- example : long length 13mm  short length 8.5mm  thickness 2.5mm  \( \Rightarrow L1300525 \) or \( L1308525 \)

Triangle  \( T\theta1a1a2a3(b1b2b3)t1t2 \)
- \( \theta \) : representation angle  \( b \) : case of right angle triangle  \( t \) : thickness
- example : \( \theta \) 60°  \( a = 5.0mm \)  thickness 2.5mm  \( \Rightarrow T6005025 \)

thickness : under 4.8mm
- When you need other shapes, please inquire.
- When you order, please specify the details as, for example, “50 pieces of KT30X R160032 and 10 pieces of KS10 SQ10032”.

The above are representative values not guaranteed ones.

Special products

<table>
<thead>
<tr>
<th>Type</th>
<th>Diameter</th>
<th>PCBN (mm)</th>
<th>Thickness (mm)</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>G type*</td>
<td>Ø 60</td>
<td>1.0 – 3.0 t</td>
<td>5 – 13 t</td>
<td>KT30X</td>
</tr>
<tr>
<td></td>
<td>Ø 29</td>
<td>1.0 – 2.0 t</td>
<td>5 – 13 t</td>
<td>KT30X</td>
</tr>
<tr>
<td>Special solid*</td>
<td>Ø 60</td>
<td>1.0 – 24 t</td>
<td>___</td>
<td>KS10 KS25</td>
</tr>
<tr>
<td></td>
<td>Ø 29</td>
<td>0.5 – 12 t</td>
<td>___</td>
<td>KS10 KS25 KS30X</td>
</tr>
</tbody>
</table>

* The above are Nonstandard. Ask for details.
The above are representative values not guaranteed ones.
Outline of the Shiojiri Plant

Address: 1, Oaza Soga, Shiojiri, Nagano, 399-6461 Japan  TEL: +81-263-52-0180
Plant area: Approximately 300,000 m²
Private power station: Akamatsu power station (maximum output: 5,500 kw)

History of the Shiojiri Plant

1911 Established as Suwa Denki Kogyo K.K.
December 1932 Renamed to Shiojiri Plant, Nihon Iodine K.K.
October 1933 Started manufacturing Densic (C)
December 1933 Started manufacturing Green Densic (GC)
March 1934 Renamed to Shiojiri Plant, Nihon Electrical Industries K.K.
September 1934 Started manufacturing Morundum (A)
August 1938 Started manufacturing White Morundum (WA)
June 1939 Renamed to Shiojiri Plant, Showa Denko K.K.
November 1950 Akamatsu power station constructed
May 1962 Technical tie-up with Carborundum of America
March 1978 Started manufacturing Cubic boron nitride (SBN)
June 1982 Started manufacturing spraying material (PSP)
May 1983 Started manufacturing Ultra Densic (DU)
August 1984 Started manufacturing silicon carbide powders (GC derivative)
January 1985 Started manufacturing cBN sintered compacts (SBN-K TIP)
November 1987 Started manufacturing silicon carbide compacts (SHOCERAM C)
July 1996 Started manufacturing mirror polishing agent for aluminum discs (SPL)
November 1998 Acquired ISO14001 certification
September 1999 Acquired ISO9001 certification
March 2000 Renamed to Showa Denko Shiojiri Plant
May 2000 Started manufacturing CMP abrasives for semiconductor devices (GPL)
January 2001 Started manufacturing mirror polishing agents for glass discs (SHOROX V)
December 2003 Established Lianyungang Zhaoling Abrasives Co., Ltd.
March 2006 Developed world's largest sintered compacts of cBN (solid)
2006 Won the award for excellence about TPM (Total Productive Maintenance)
2010 Acquired OHSAS18001 certification
SHOWA DENKO K.K.

Sales Network

Japan (Taiwan Korea area)  www.sdk.co.jp

- Head Office: Marketing Department 1, Abrasives & Super-abrasives Sales Group
  8, Ebisu-cho, Kanagawa-ku, Yokohama, Kanagawa, 221-8517 Japan
  TEL: +81-45-453-5122  FAX: +81-45-453-5645

- Operation · R&D Site: Shiojiri Plant
  1, Oaza Soga, Shiojiri, Nagano, 399-6461 Japan
  TEL: +81-263-52-0180

Europe area  support@sde.de

- Showa Denko Europe GmbH
  Konrad-Zuse-Platz 4, 81829 Munich, Germany
  TEL: +49-89-9399620

America area  sales@showadenko.us

- Showa Denko America, Inc.
  420 Lexington Avenue, Suite #2335A, New York, NY 10170, U.S.A.
  TEL: +1-212-370-0033

China  www.sdk.co.jp

- Showa Denko (Shanghai) Co., Ltd.
  18F, WangWang Building No.211 Shimen Yi Road, Shanghai 200041, China
  TEL: +86-21-6217-5000

Asia (Other) area  www.sdk.co.jp

- Showa Denko Singapore(Pte.)Ltd.
  4 Shenton Way #16-01 SGX Centre 2, Singapore 068807
  TEL: +65-6223-1889