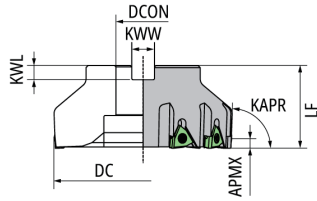


# For Gray / Ductile Cast Iron

## JWNXM series / Cutter Lead angle 88 degree

### JWNXM Arbor type



| EDP     | Item Number        | Stock | Hand | Number of teeth | APMX<br>mm | APMX2<br>mm | DC<br>mm | DCON<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | KWL<br>mm | KWW<br>mm | LF<br>mm | Weight<br>kg | Insert Gage |
|---------|--------------------|-------|------|-----------------|------------|-------------|----------|------------|-----------|-----------|-----------|-----------|-----------|----------|--------------|-------------|
| 5974084 | JWNXM063C2200R06-A | ●     | R    | 6               | ~5.5       | 4.5         | 63       | 22         | +4        | +5        | 88        | 6.3       | 10.4      | 50       | 0.9          | WNX44..     |
| 5974092 | JWNXM080A2540R08-A | ●     | R    | 8               | ~5.5       | 4.5         | 80       | 25.4       | +7        | +5        | 88        | 6         | 9.5       | 50       | 1.1          | WNX44..     |
| 5972724 | JWNXM100A3175R10-A | ●     | R    | 10              | ~5.5       | 4.5         | 100      | 31.75      | +10       | +5        | 88        | 8         | 12.7      | 50       | 1.8          | WNX44..     |
| 5974100 | JWNXM125A3810R12-A | ●     | R    | 12              | ~5.5       | 4.5         | 125      | 38.1       | +10       | +5        | 88        | 10        | 15.9      | 58       | 3            | WNX44..     |
| 5974118 | JWNXM160A5080R16-A | ●     | R    | 16              | ~5.5       | 4.5         | 160      | 50.8       | +10       | +5        | 88        | 11        | 19        | 60       | 4.9          | WNX44..     |

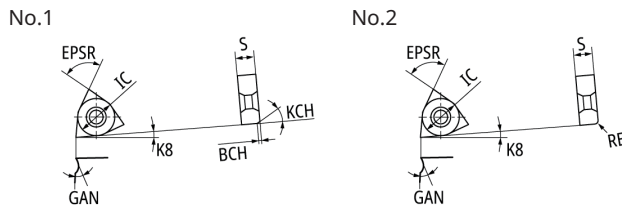
※Weight : Includes inserts and parts

### Spare Parts

| Item Number        | Clamp screw     | Wrench<br>(for Clamp screw) |
|--------------------|-----------------|-----------------------------|
| JWNXM063C2200R06-A | FSI26-4.0*12-LH | LLR-T15                     |
| JWNXM080A2540R08-A | FSI26-4.0*12-LH | LLR-T15                     |
| JWNXM100A3175R10-A | FSI26-4.0*12-LH | LLR-T15                     |
| JWNXM125A3810R12-A | FSI26-4.0*12-LH | LLR-T15                     |
| JWNXM160A5080R16-A | FSI26-4.0*12-LH | LLR-T15                     |

## JWNXM series / Inserts Ceramics

### WNX44

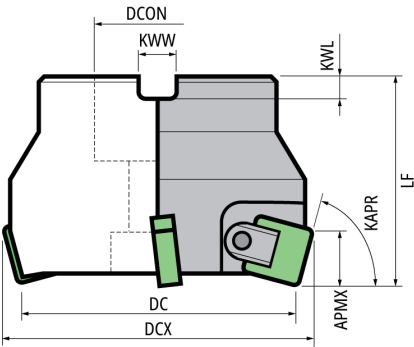


| Figure | Item Number     | Chip-breaker | Wiper    | APMX<br>mm | BCH<br>mm | BS<br>mm | EPSR<br>° | GAN<br>° | IC<br>mm | K8<br>° | KCH<br>° | RE<br>mm | S<br>mm | Silicon Nitride<br>Ceramics | CVD |
|--------|-----------------|--------------|----------|------------|-----------|----------|-----------|----------|----------|---------|----------|----------|---------|-----------------------------|-----|
| 1      | WNX44-C10T01020 | Yes          | Straight | 5.5        | 1         | (0.6)    | 80        | 20       | 12.7     | 10      | 30       | -        | 6.35    | ●                           | ●   |
| 2      | WNX44-R12T01020 | Yes          | No       | 4.5        | -         | -        | 80        | 20       | 12.7     | 10      | -        | 1.2      | 6.35    | ●                           | ●   |

For Gray / Ductile Cast Iron

JFDX.. series / Cutter Lead angle 75 degree

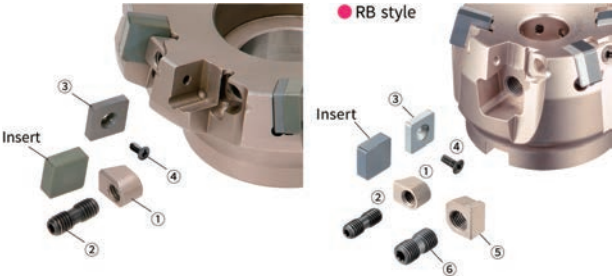
JFDX-75



| EDP     | Item Number     | Stock | Hand | Number of teeth | APMX | DC  | DCON  | DCX | GAMF | GMAP | KAPR | KWL | KWW  | LF | Weight | Insert Gage |           |
|---------|-----------------|-------|------|-----------------|------|-----|-------|-----|------|------|------|-----|------|----|--------|-------------|-----------|
|         |                 |       |      |                 | mm   | mm  | mm    | mm  | °    | °    | °    | mm  | mm   | mm | kg     |             |           |
| 5729884 | JFDX063-75-06R  | ●     | R    | 6               | ~6   | 63  | 22    | 70  | -10  | -6   | 75   | 6   | 10.4 | 50 | 0.79   | SN..1204..  | FDX1204.. |
| 5909767 | JFDX063-75-06RB | ●     | R    | 6               | ~6   | 63  | 22    | 70  | -10  | -6   | 75   | 6   | 10.4 | 50 | 0.97   | SN..1204..  | FDX1204.. |
| 5729892 | JFDX080-75-08R  | ●     | R    | 8               | ~6   | 80  | 25.4  | 87  | -10  | -6   | 75   | 6   | 9.5  | 50 | 1.06   | SN..1204..  | FDX1204.. |
| 5909775 | JFDX080-75-08RB | ●     | R    | 8               | ~6   | 80  | 25.4  | 87  | -10  | -6   | 75   | 6   | 9.5  | 50 | 1.36   | SN..1204..  | FDX1204.. |
| 5729900 | JFDX100-75-10R  | ●     | R    | 10              | ~6   | 100 | 31.75 | 107 | -10  | -6   | 75   | 8   | 12.7 | 50 | 1.39   | SN..1204..  | FDX1204.. |
| 5909791 | JFDX100-75-10RB | ●     | R    | 10              | ~6   | 100 | 31.75 | 107 | -10  | -6   | 75   | 8   | 12.7 | 50 | 1.83   | SN..1204..  | FDX1204.. |
| 5729918 | JFDX125-75-12R  | ●     | R    | 12              | ~6   | 125 | 38.1  | 132 | -10  | -6   | 75   | 10  | 15.9 | 58 | 2.56   | SN..1204..  | FDX1204.. |
| 5909809 | JFDX125-75-12RB | ●     | R    | 12              | ~6   | 125 | 38.1  | 132 | -10  | -6   | 75   | 10  | 15.9 | 58 | 3.34   | SN..1204..  | FDX1204.. |
| 5909817 | JFDX160-75-16RB | ●     | R    | 16              | ~6   | 160 | 50.8  | 166 | -10  | -6   | 75   | 11  | 19   | 60 | 5.47   | SN..1204..  | FDX1204.. |

※Weight : Includes inserts and parts  
※RB type : One insert pocket can be adjusted for height

Spare Parts



| Item Number     | Wedge  | Wedge  | Shim   | Clamp screw | Screw (for Shim) | Screw (for Wedge) | Wrench (for Clamp screw) | Wrench (for Wedge) |
|-----------------|--------|--------|--------|-------------|------------------|-------------------|--------------------------|--------------------|
|                 | ①      | ⑤      | ③      | ②           | ④                | ⑥                 |                          |                    |
| JFDX063-75-06R  | HLW175 | -      | ASN423 | WS0616-T15  | M3*8             | -                 | T-15A                    | -                  |
| JFDX063-75-06RB | HLW175 | HLW177 | ASN423 | WS0616-T15  | M3*8             | WS0816-T25        | T-15A                    | LLR-T25            |
| JFDX080-75-08R  | HLW175 | -      | ASN423 | WS0616-T15  | M3*8             | -                 | T-15A                    | -                  |
| JFDX080-75-08RB | HLW175 | HLW177 | ASN423 | WS0616-T15  | M3*8             | WS0816-T25        | T-15A                    | LLR-T25            |
| JFDX100-75-10R  | HLW175 | -      | ASN423 | WS0616-T15  | M3*8             | -                 | T-15A                    | -                  |
| JFDX100-75-10RB | HLW175 | HLW177 | ASN423 | WS0616-T15  | M3*8             | WS0816-T25        | T-15A                    | LLR-T25            |
| JFDX125-75-12R  | HLW175 | -      | ASN423 | WS0616-T15  | M3*8             | -                 | T-15A                    | -                  |
| JFDX125-75-12RB | HLW175 | HLW177 | ASN423 | WS0616-T15  | M3*8             | WS0816-T25        | T-15A                    | LLR-T25            |
| JFDX160-75-16RB | HLW175 | HLW177 | ASN423 | WS0616-T15  | M3*8             | WS0816-T25        | T-15A                    | LLR-T25            |

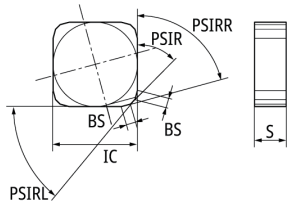
# JFDX.. series / Insert Ceramics

## SNGN/SNGF

| No.1   |       | No.2        |      |      |    |                       |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|        |       |             |      |      |    | Stainless Steel       |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    | Cast Iron             |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    | Non-Ferrous Material  |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    | Heat Resistant Alloy  |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    | Hardened Material     |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    | Others (non-metallic) |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Figure | Shape | Item Number | CECC | EPSR | IC | S                     | RE | GAN | BIDEMICS |     |     |     | Alumina Ceramics |             |     |     |     |     |     | Silicon Nitride Ceramics |     |     |     | Whisker Ceramics |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    |                       |    |     | PVD      | PVD | JX1 | JX3 | PVD              | NTK Ceramix | HC1 | HW2 | HC2 | HC4 | HC6 | HC7                      | PVD | SX3 | SX5 | SX7              | SX9 | SX6 | CVD | SP9 | WA1 | WA5 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       |             |      |      |    |                       |    |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     | 120 | JP2 | 450 | HC1 | HW2 | HC2 | HC4 | HC6 | HC7 | PVD | SX3 | SX5 | SX7 | SX9 | SX6 | CVD | SP9 | WA1 | WA5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        |       | (ISO)       |      | °    | mm | mm                    | mm | °   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |     |     |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

※Recommended Cutting Conditions  
Cutting Speed  $V_c = - 1000\text{m/min}$   
Feed  $f = - 0.1\text{mm/t}$

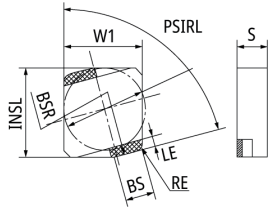
## SNGN-EN Inserts Ceramics Wiper : The insert must be installed in all insert pockets



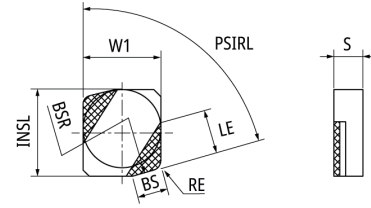
| Item Number      | Chip-breaker | Wiper    | BS    | IC   | KAPR | PSIR | PSIRL | PSIRR | S    | Silicon Nitride Ceramics |         |
|------------------|--------------|----------|-------|------|------|------|-------|-------|------|--------------------------|---------|
|                  |              |          | mm    | mm   | °    | °    | °     | °     | mm   | SX6                      | CVD SP9 |
| SNGN1204ENT01025 | No           | Straight | (1.4) | 12.7 | 75   | 45   | 75    | 75    | 4.76 | ●                        | ●       |

## FDX-75 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

No.1



No.2



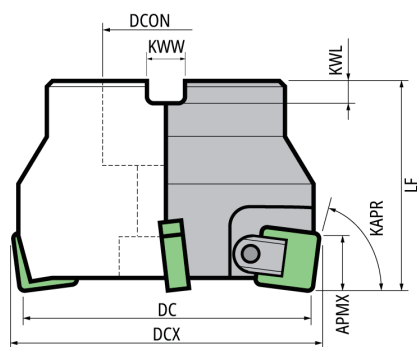
| Figure | Item Number    | Chip-breaker | Wiper | BS    | BSR | INSL | LE     | PSIRL | RE  | S    | W1   | CBN |     |
|--------|----------------|--------------|-------|-------|-----|------|--------|-------|-----|------|------|-----|-----|
|        |                |              |       | mm    | mm  | mm   | mm     | °     | mm  | mm   | mm   | B30 | B52 |
| 1      | FDX1204-75-50R | No           | Arch  | (4.5) | 250 | 13.8 | 1.5    | 75    | 1.2 | 4.76 | 12.2 | ●   | ●   |
| 2      | FDX1204-75-51R | No           | Arch  | (5.0) | 250 | 13.8 | (.276) | 75    | 1.2 | 4.76 | 12.7 | ★   |     |
| 2      | FDX1204-75-52R | No           | Arch  | (5.0) | 250 | 13.8 | (.276) | 75    | 1.6 | 4.76 | 12.7 | ★   |     |

※FDX1204-75-51R/52R : For RB type. Bottom wiper insert that can also be machined around the periphery.  
Use for pockets with adjustable insert height.  
Selecting the same corner radius as the ceramic insert enables high-efficiency machining.

# For Gray / Ductile Cast Iron

## JFDX.. series / Cutter Lead angle 88 degree

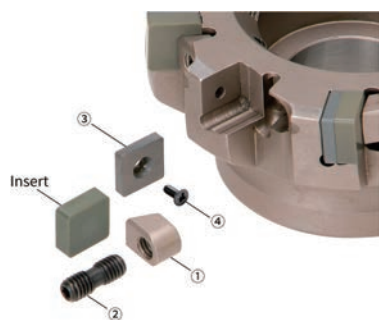
### JFDX-88



| EDP     | Item Number    | Stock | Hand | Number of teeth | APMX<br>mm | DC<br>mm | DCON<br>mm | DCX<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | KWL<br>mm | KWW<br>mm | LF<br>mm | Weight<br>kg | Insert Gage |           |
|---------|----------------|-------|------|-----------------|------------|----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|--------------|-------------|-----------|
| 5729926 | JFDX063-88-06R | ●     | R    | 6               | ~6         | 63       | 22         | 64        | -10       | -6        | 88        | 6         | 10.4      | 50       | 0.79         | SN..1204..  | FDX1204.. |
| 5729934 | JFDX080-88-08R | ●     | R    | 8               | ~6         | 80       | 25.4       | 81        | -10       | -6        | 88        | 6         | 9.5       | 50       | 1.03         | SN..1204..  | FDX1204.. |
| 5729942 | JFDX100-88-10R | ●     | R    | 10              | ~6         | 100      | 31.75      | 101       | -10       | -6        | 88        | 8         | 12.7      | 50       | 1.38         | SN..1204..  | FDX1204.. |
| 5729959 | JFDX125-88-12R | ●     | R    | 12              | ~6         | 125      | 38.1       | 126       | -10       | -6        | 88        | 10        | 15.9      | 58       | 2.61         | SN..1204..  | FDX1204.. |

※Weight : Includes inserts and parts

### Spare Parts



| Item Number    | Wedge<br>① | Shim<br>③ | Clamp screw<br>② | Screw<br>(for Shim)<br>④ | Wrench<br>(for Clamp screw) |
|----------------|------------|-----------|------------------|--------------------------|-----------------------------|
| JFDX063-88-06R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX080-88-08R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX100-88-10R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX125-88-12R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |

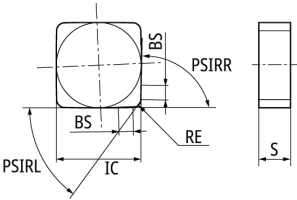
JFDX.. series / Inserts Ceramics

SNGN/SNGF

|        |       |                     |        |      |      |      |     |     |          |     |     | Steel                 |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|--------|-------|---------------------|--------|------|------|------|-----|-----|----------|-----|-----|-----------------------|------------------|-------------|-----|-----|-----|-----|-----|--------------------------|-----|-----|-----|-----|------------------|-----|-----|-----|-----|-----|--|
|        |       |                     |        |      |      |      |     |     |          |     |     | Stainless Steel       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     |          |     |     | Cast Iron             |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     |          |     |     | Non-Ferrous Material  |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     |          |     |     | Heat Resistant Alloy  |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     |          |     |     | Hardened Material     |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     |          |     |     | Others (non-metallic) |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| Figure | Shape | Item Number         | CECC   | EPSR | IC   | S    | RE  | GAN | BIDEMICS |     |     |                       | Alumina Ceramics |             |     |     |     |     |     | Silicon Nitride Ceramics |     |     |     |     | Whisker Ceramics |     |     |     |     |     |  |
|        |       |                     |        |      |      |      |     |     | PVD      | PVD | JX1 | JX3                   | PVD              | NTK CeramIX | HC1 | HW2 | HC2 | HC4 | HC6 | HC7                      | PVD | SX3 | SX5 | SX7 | SX9              | SX6 | CVD | SP9 | WA1 | WA5 |  |
|        |       |                     |        |      |      |      |     |     |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
|        |       | (ISO)               |        | °    | mm   | mm   | mm  | °   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408S02025    | S02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T00520    | T00520 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T00820    | T00820 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T01020    | T01020 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T01025    | T01025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T02020    | T02020 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408T02025    | T02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120408Z02025    | Z02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412S02025    | S02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T00520    | T00520 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T00820    | T00820 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T01020    | T01020 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T01025    | T01025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T02020    | T02020 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412T02025    | T02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120412Z02025    | Z02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416S02025    | S02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416T00520    | T00520 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416T01020    | T01020 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416T01025    | T01025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416T02020    | T02020 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| -      |       | SNGN120416T02025    | T02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 1      |       | SNGN120416Z02025    | Z02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 2      |       | SNGF120412T01025RC  | T01025 | 90   | 12.7 | 4.76 | 1.2 | 14  |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |
| 2      |       | SNGF120412T01025RCM | T01025 | 90   | 12.7 | 4.76 | 1.2 | 14  |          |     |     |                       |                  |             |     |     |     |     |     |                          |     |     |     |     |                  |     |     |     |     |     |  |

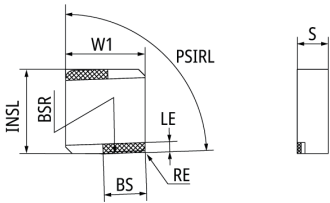
※Recommended Cutting Conditions  
Cutting Speed V<sub>c</sub> = - 1000m/min  
Feed f = - 0.1mm/t

■ **SNEN-ZN Inserts Ceramic Wiper : The insert must be installed in all insert pockets**



| Item Number      | Chip-breaker | Wiper    | BS    | IC   | KAPR | PSIRL | PSIRR | RE  | S    | Silicon Nitride Ceramics |         |
|------------------|--------------|----------|-------|------|------|-------|-------|-----|------|--------------------------|---------|
|                  |              |          | mm    | mm   | °    | °     | °     | mm  | mm   | SX6                      | CVD SP9 |
| SNEN1204ZNT01025 | No           | Straight | (2.0) | 12.7 | 89   | 89    | 89    | 1.2 | 4.76 | ●                        | ●       |

■ **FDX-88 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert**

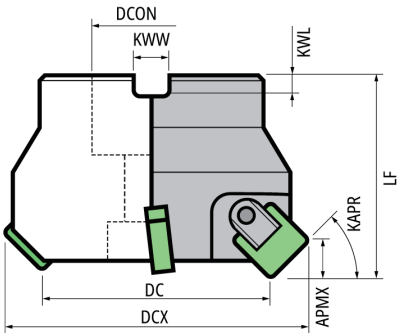


| Item Number    | Chip-breaker | Wiper | BS   | BSR | INSL  | LE  | PSIRL | RE  | S    | W1   | CBN |     |
|----------------|--------------|-------|------|-----|-------|-----|-------|-----|------|------|-----|-----|
|                |              |       | mm   | mm  | mm    | mm  | °     | mm  | mm   | mm   | B30 | B52 |
| FDX1204-88-50R | No           | Arch  | 6.15 | 250 | 12.95 | 1.5 | 88    | 1.2 | 4.76 | 12.2 | ●   | ●   |

For Gray / Ductile Cast Iron

JFDX.. series / Cutter Lead angle 45 degree

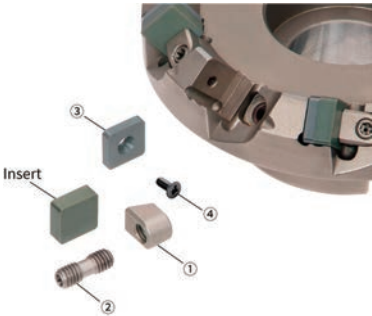
JFDX-45



| EDP     | Item Number    | Stock | Hand | Number of teeth | APMX | DC  | DCON  | DCX | GAMF | GMAP | KAPR | KWL | KWW  | LF | Weight<br>kg | Insert Gage |           |
|---------|----------------|-------|------|-----------------|------|-----|-------|-----|------|------|------|-----|------|----|--------------|-------------|-----------|
|         |                |       |      |                 | mm   | mm  | mm    | mm  | °    | °    | °    | mm  | mm   | mm |              |             |           |
| 5727458 | JFDX063-45-06R | ●     | R    | 6               | ~6   | 63  | 22    | 72  | -10  | -6   | 45   | 6   | 10.4 | 50 | 0.93         | SN..1204..  | FDX1204.. |
| 5727441 | JFDX080-45-08R | ●     | R    | 8               | ~6   | 80  | 25.4  | 95  | -10  | -6   | 45   | 6   | 9.5  | 50 | 1.21         | SN..1204..  | FDX1204.. |
| 5727433 | JFDX100-45-10R | ●     | R    | 10              | ~6   | 100 | 31.75 | 120 | -10  | -6   | 45   | 8   | 12.7 | 50 | 1.66         | SN..1204..  | FDX1204.. |
| 5727425 | JFDX125-45-12R | ●     | R    | 12              | ~6   | 125 | 38.1  | 146 | -10  | -6   | 45   | 10  | 15.9 | 58 | 2.8          | SN..1204..  | FDX1204.. |

※Weight : Includes inserts and parts

Spare Parts



| Item Number    | Wedge<br>① | Shim<br>③ | Clamp screw<br>② | Screw<br>(for Shim)<br>④ | Wrench<br>(for Clamp screw) |
|----------------|------------|-----------|------------------|--------------------------|-----------------------------|
| JFDX063-45-06R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX080-45-08R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX100-45-10R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |
| JFDX125-45-12R | HLW175     | ASN423    | WS0616-T15       | M3*8                     | T-15A                       |



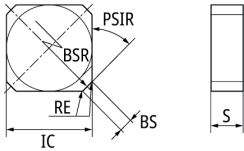
# JFDX.. series / Inserts Ceramics

## SNGN/SNGF

|        |       | Steel                 |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|--------|-------|-----------------------|--------|------|------|------|-----|-----|----------|-----|-----|-----|------------------|-------------|-----|-----|-----|-----|-----|--------------------------|-----|------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|        |       | Stainless Steel       |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | Cast Iron             |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | Non-Ferrous Material  |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | Heat Resistant Alloy  |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | Hardened Material     |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | Others (non-metallic) |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       |                       |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| Figure | Shape | Item Number           | CECC   | EPSR | IC   | S    | RE  | GAN | BIDEMICS |     |     |     | Alumina Ceramics |             |     |     |     |     |     | Silicon Nitride Ceramics |     | Whisker Ceramics |     |     |     |     |     |     |     |     |
|        |       |                       |        |      |      |      |     |     | PVD      | PVD | JX1 | JX3 | PVD              | NTK CeramiX | HC1 | HW2 | HC2 | HC4 | HC6 | HC7                      | PVD | SX3              | SX5 | SX7 | SX9 | SX6 | CVD | SP9 | WA1 | WA5 |
|        |       |                       |        |      |      |      |     |     |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
|        |       | (ISO)                 |        | °    | mm   | mm   | mm  | °   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408S02025      | S02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T00520      | T00520 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T00820      | T00820 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T01020      | T01020 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T01025      | T01025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T02020      | T02020 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408T02025      | T02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120408Z02025      | Z02025 | 90   | 12.7 | 4.76 | 0.8 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412S02025      | S02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T00520      | T00520 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T00820      | T00820 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T01020      | T01020 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T01025      | T01025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T02020      | T02020 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412T02025      | T02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120412Z02025      | Z02025 | 90   | 12.7 | 4.76 | 1.2 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416S02025      | S02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416T00520      | T00520 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416T01020      | T01020 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416T01025      | T01025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416T02020      | T02020 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| -      |       | SNGN120416T02025      | T02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 1      |       | SNGN120416Z02025      | Z02025 | 90   | 12.7 | 4.76 | 1.6 | -   |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 2      |       | SNGF120412T01025RC    | T01025 | 90   | 12.7 | 4.76 | 1.2 | 14  |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |
| 2      |       | SNGF120412T01025RCM   | T01025 | 90   | 12.7 | 4.76 | 1.2 | 14  |          |     |     |     |                  |             |     |     |     |     |     |                          |     |                  |     |     |     |     |     |     |     |     |

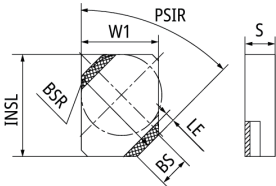
※Recommended Cutting Conditions  
Cutting Speed  $V_c = - 1000\text{m/min}$   
Feed  $f = - 0.1\text{mm/t}$

**SNGN-AN Inserts Ceramic Wiper : The insert must be installed in all insert pockets**



| Item Number       | Chip-breaker | Wiper | BS | BSR | IC   | PSIR | RE  | S    | Silicon Nitride Ceramics |         |
|-------------------|--------------|-------|----|-----|------|------|-----|------|--------------------------|---------|
|                   |              |       | mm | mm  | mm   | °    | mm  | mm   | SX6                      | CVD SP9 |
| SNGN1204ANWT01020 | No           | Arch  | 2  | 150 | 12.7 | 45   | 0.5 | 4.76 | ●                        | ●       |

**FDX-45 Inserts CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert**

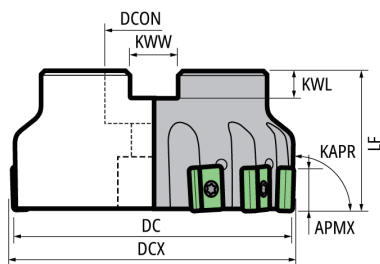


| Item Number    | Chip-breaker | Wiper | BS    | BSR | INSL | LE  | PSIR | S    | W1   | CBN |     |
|----------------|--------------|-------|-------|-----|------|-----|------|------|------|-----|-----|
|                |              |       | mm    | mm  | mm   | mm  | °    | mm   | mm   | B30 | B52 |
| FDX1204-45-50R | No           | Arch  | (4.8) | 250 | 16   | 1.5 | 45   | 4.76 | 12.2 | ●   | ●   |

## For Gray / Ductile Cast Iron

### JXTM series / Cutter Lead angle 88 degree

#### JXTM-88 Arbor type



| EDP     | Item Number    | Stock | Hand | Number of teeth | APMX<br>mm | DC<br>mm | DCON<br>mm | DCX<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | KWL<br>mm | KWW<br>mm | LF<br>mm | Weight<br>kg | Insert Gage |
|---------|----------------|-------|------|-----------------|------------|----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|--------------|-------------|
| 5729652 | JXTM080-88-10R | ●     | R    | 10              | ~8         | 80       | 25.4       | 83        | 0         | -4        | 88        | 6         | 9.5       | 50       | 1.1          | LN324M..    |
| 5729660 | JXTM100-88-13R | ●     | R    | 13              | ~8         | 100      | 31.75      | 103       | 0         | -4        | 88        | 8         | 12.7      | 50       | 1.8          | LN324M..    |
| 5729678 | JXTM125-88-16R | ●     | R    | 16              | ~8         | 125      | 38.1       | 128       | 0         | -4        | 88        | 10        | 15.9      | 58       | 3.1          | LN324M..    |

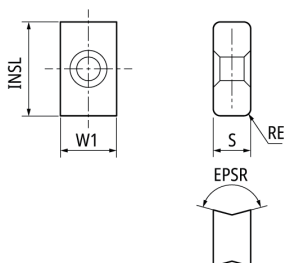
※Weight : Includes inserts and parts

#### Spare Parts

| Item Number    | Clamp screw | Wrench<br>(for Clamp screw) |
|----------------|-------------|-----------------------------|
| JXTM080-88-10R | LRIS-4*12   | LLR-25S                     |
| JXTM100-88-13R | LRIS-4*12   | LLR-25S                     |
| JXTM125-88-16R | LRIS-4*12   | LLR-25S                     |

### JXTM series / Inserts Ceramics

#### LN3

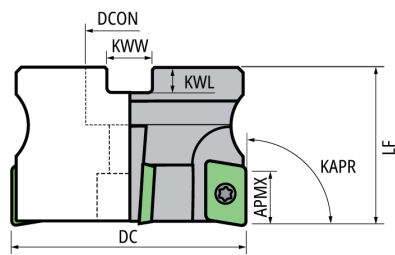


| Item Number     | Chip-breaker | Wiper | EPSR<br>° | INSL<br>mm | RE<br>mm | S<br>mm | W1<br>mm | Silicon Nitride<br>Ceramics |            |
|-----------------|--------------|-------|-----------|------------|----------|---------|----------|-----------------------------|------------|
|                 |              |       |           |            |          |         |          | SX6                         | CVD<br>SP9 |
| LN324M-08T01020 | Yes          | No    | 150       | 15.875     | 0.8      | 6.35    | 9.525    | ●                           | ●          |
| LN324M-12T01020 | Yes          | No    | 150       | 15.875     | 1.2      | 6.35    | 9.525    | ●                           | ●          |
| LN324M-16T01020 | Yes          | No    | 150       | 15.875     | 1.6      | 6.35    | 9.525    | ●                           | ●          |

## For Gray / Ductile Cast Iron

### JQ series / Cutter Lead angle 90 degree

#### JQTS Arbor type



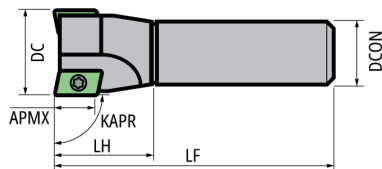
| EDP     | Item Number   | Stock | Hand | Number of teeth | APMX<br>mm | DC<br>mm | DCON<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | KWL<br>mm | KWW<br>mm | LF<br>mm | Weight<br>kg | Insert Gage |
|---------|---------------|-------|------|-----------------|------------|----------|------------|-----------|-----------|-----------|-----------|-----------|----------|--------------|-------------|
| 5730155 | JQTS040-90-4R | ●     | R    | 4               | ~8         | 40       | 16         | -13       | +6        | 90        | 5.6       | 8.4       | 40       | 0.2          | APCW1604..  |
| 5730189 | JQTS050-90-5R | ●     | R    | 5               | ~8         | 50       | 22         | -13       | +6        | 90        | 6.3       | 10.4      | 40       | 0.32         | APCW1604..  |
| 5730197 | JQTS063-90-6R | ●     | R    | 6               | ~8         | 63       | 22         | -12       | +6        | 90        | 6.3       | 10.4      | 50       | 1.4          | APCW1604..  |
| 5765573 | JQTS080-90-8R | ●     | R    | 8               | ~8         | 80       | 25.4       | -12       | +6        | 90        | 6         | 9.5       | 50       | 1.9          | APCW1604..  |

※Weight : Includes inserts and parts

#### Spare Parts

| Item Number   | Clamp screw  | Wrench<br>(for Clamp screw) |
|---------------|--------------|-----------------------------|
| JQTS040-90-4R | FSI22-4.0*11 | T-15A                       |
| JQTS050-90-5R | FSI22-4.0*11 | T-15A                       |
| JQTS063-90-6R | FSI22-4.0*11 | T-15A                       |
| JQTS080-90-8R | FSI22-4.0*11 | T-15A                       |

#### JQTE Shank type



| EDP     | Item Number   | Stock | Hand | Number of teeth | APMX<br>mm | DC<br>mm | DCON<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | LF<br>mm | LH<br>mm | Weight<br>kg | Insert Gage |
|---------|---------------|-------|------|-----------------|------------|----------|------------|-----------|-----------|-----------|----------|----------|--------------|-------------|
| 5730114 | JQTE020-90-1R | ●     | R    | 1               | ~8         | 20       | 20         | -8        | +3        | 90        | 100      | 30       | 0.22         | APCW1604..  |
| 5730122 | JQTE025-90-2R | ●     | R    | 2               | ~8         | 25       | 25         | -13       | +6        | 90        | 100      | 30       | 0.32         | APCW1604..  |
| 5730130 | JQTE032-90-3R | ●     | R    | 3               | ~8         | 32       | 32         | -13       | +6        | 90        | 120      | 35       | 0.53         | APCW1604..  |
| 5730148 | JQTE040-90-4R | ●     | R    | 4               | ~8         | 40       | 32         | -13       | +6        | 90        | 120      | 37       | 0.64         | APCW1604..  |

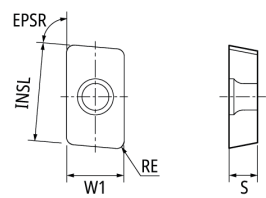
※Weight : Includes inserts and parts

#### Spare Parts

| Item Number   | Clamp screw  | Wrench<br>(for Clamp screw) |
|---------------|--------------|-----------------------------|
| JQTE020-90-1R | FSI23-4.0*7  | T-15A                       |
| JQTE025-90-2R | FSI23-4.0*7  | T-15A                       |
| JQTE032-90-3R | FSI22-4.0*11 | T-15A                       |
| JQTE040-90-4R | FSI22-4.0*11 | T-15A                       |

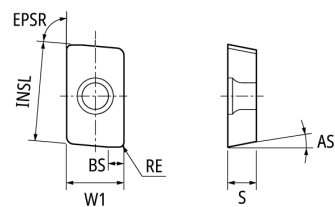
JQ series / Inserts Ceramics

APCW



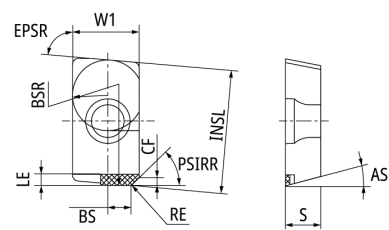
| Item Number      | Chip-breaker | Wiper | EPSR | INSL  | RE  | S    | W1    | Silicon Nitride Ceramics |         |
|------------------|--------------|-------|------|-------|-----|------|-------|--------------------------|---------|
|                  |              |       | °    | mm    | mm  | mm   | mm    | SX6                      | CVD SP9 |
| APCW160408T01020 | No           | No    | 85   | 16.46 | 0.8 | 4.76 | 9.525 | ●                        | ●       |
| APCW160412T01020 | No           | No    | 85   | 16.46 | 1.2 | 4.76 | 9.525 | ●                        | ●       |
| APCW160420T01020 | No           | No    | 85   | 16.46 | 2   | 4.76 | 9.525 | ●                        | ●       |

APCW-PD Insert Ceramics Wiper



| Item Number       | Chip-breaker | Wiper    | AS | BS  | EPSR | INSL  | RE  | S    | W1    | Silicon Nitride Ceramics |         |
|-------------------|--------------|----------|----|-----|------|-------|-----|------|-------|--------------------------|---------|
|                   |              |          | °  | mm  | °    | mm    | mm  | mm   | mm    | SX6                      | CVD SP9 |
| APCW1604PDRT01020 | No           | Straight | 15 | 2.6 | 85   | 16.46 | 0.8 | 4.76 | 9.525 | ●                        | ●       |

APCW-PD Insert CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert



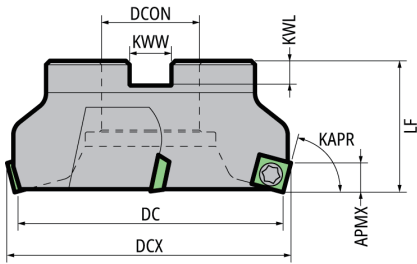
| Item Number       | Chip-breaker | Wiper | AS | BS    | BSR | CF | EPSR | INSL   | LE  | PSIRR | RE  | S    | W1 | CBN |     |
|-------------------|--------------|-------|----|-------|-----|----|------|--------|-----|-------|-----|------|----|-----|-----|
|                   |              |       | °  | mm    | mm  | mm | °    | mm     | mm  | °     | mm  | mm   | mm | B30 | B52 |
| APCW1604PDRS01020 | No           | Arch  | 15 | (3.2) | 250 | 1  | 85   | 16.579 | 1.5 | 45    | 0.4 | 4.76 | 9  | ●   | ●   |

Milling Cutter  
I

For Gray / Ductile Cast Iron

JSDW series / Cutter Lead angle 75 degree

JSDW-75 Arbor type



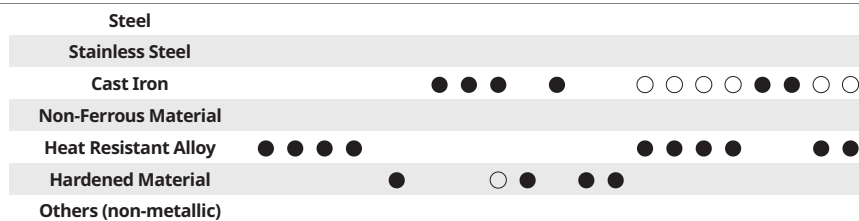
| EDP     | Item Number    | Stock | Hand | Number of teeth | APMX<br>mm | DC<br>mm | DCON<br>mm | DCX<br>mm | GAMF<br>° | GMAP<br>° | KAPR<br>° | KWL<br>mm | KWW<br>mm | LF<br>mm | Weight<br>kg | Insert Gage |           |
|---------|----------------|-------|------|-----------------|------------|----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|--------------|-------------|-----------|
| 5729991 | JSDW063-75-04R | ●     | R    | 4               | ~6         | 63       | 22         | 70.6      | 0         | +12       | 75        | 6.3       | 10.4      | 50       | 0.82         | SDCW1204..  | SDW1204.. |
| 5730007 | JSDW080-75-05R | ●     | R    | 5               | ~6         | 80       | 25.4       | 83.3      | 0         | +12       | 75        | 6         | 9.5       | 50       | 1.04         | SDCW1204..  | SDW1204.. |
| 5730015 | JSDW100-75-06R | ●     | R    | 6               | ~6         | 100      | 31.75      | 108.7     | 0         | +12       | 75        | 8         | 12.7      | 50       | 1.33         | SDCW1204..  | SDW1204.. |
| 5730106 | JSDW125-75-07R | ●     | R    | 7               | ~6         | 125      | 38.1       | 134.1     | 0         | +12       | 75        | 10        | 15.9      | 58       | 2.54         | SDCW1204..  | SDW1204.. |

※Weight : Includes inserts and parts  
※APMX : Carbide inserts Max 4mm

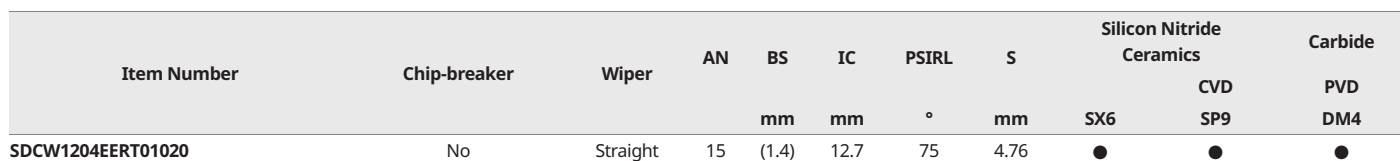
Spare Parts

| Item Number    | Clamp screw     | Wrench<br>(for Clamp screw) |
|----------------|-----------------|-----------------------------|
| JSDW063-75-04R | FSI21-5.0*12.45 | T-20                        |
| JSDW080-75-05R | FSI21-5.0*12.45 | T-20                        |
| JSDW100-75-06R | FSI21-5.0*12.45 | T-20                        |
| JSDW125-75-07R | FSI21-5.0*12.45 | T-20                        |

## SDCW



### SDCW-EE Insert Ceramic Wiper

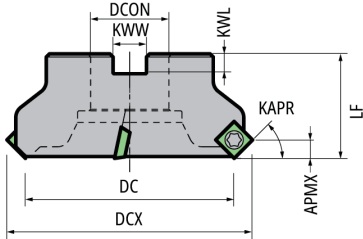


| Item Number           | Chip-breaker | Wiper | AN | BS    | BSR | LE  | PSIRL | S    | W1   | CBN |     |
|-----------------------|--------------|-------|----|-------|-----|-----|-------|------|------|-----|-----|
|                       |              |       | °  | mm    | mm  | mm  | °     | mm   | mm   | B30 | B52 |
| <b>SDW1204-75-50R</b> | No           | Arch  | 15 | (4.9) | 250 | 1.5 | 75    | 4.76 | 12.2 | ●   | ●   |

# For Gray / Ductile Cast Iron

## JSDW series / Cutter Lead angle 45 degree

### JSDW-45 Arbor type



| EDP     | Item Number    | Stock | Hand | Number of teeth | APMX | DC  | DCON  | DCX   | GAMF | GMAP | KAPR | KWL | KWW  | LF | Weight | Insert Gage |           |
|---------|----------------|-------|------|-----------------|------|-----|-------|-------|------|------|------|-----|------|----|--------|-------------|-----------|
|         |                |       |      |                 | mm   | mm  | mm    | mm    | °    | °    | °    | mm  | mm   | mm | kg     |             |           |
| 5729967 | JSDW080-45-06R | ●     | R    | 6               | ~6   | 80  | 25.4  | 95    | 0    | +12  | 45   | 6   | 9.5  | 50 | 1.1    | SDCW1204..  | SDW1204.. |
| 5729975 | JSDW100-45-07R | ●     | R    | 7               | ~6   | 100 | 31.75 | 120.4 | 0    | +12  | 45   | 8   | 12.7 | 50 | 1.39   | SDCW1204..  | SDW1204.. |
| 5729983 | JSDW125-45-08R | ●     | R    | 8               | ~6   | 125 | 38.1  | 145.8 | 0    | +12  | 45   | 10  | 15.9 | 58 | 2.55   | SDCW1204..  | SDW1204.. |

※Weight : Includes inserts and parts  
 ※APMX : Carbide inserts Max 4mm

### Spare Parts

| Item Number    | Clamp screw     | Wrench<br>(for Clamp screw) |
|----------------|-----------------|-----------------------------|
| JSDW080-45-06R | FSI21-5.0*12.45 | T-20                        |
| JSDW100-45-07R | FSI21-5.0*12.45 | T-20                        |
| JSDW125-45-08R | FSI21-5.0*12.45 | T-20                        |



JSDW series / Inserts Ceramics

SDCW

|       |             |                       |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|-------|-------------|-----------------------|--------|----|------|------|----|-----|------|----|----|----------|-----|-----|-----|------------------|-----|-----|--------------------------|-----|-----|------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|       |             | Steel                 |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Stainless Steel       |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Cast Iron             |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Non-Ferrous Material  |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Heat Resistant Alloy  |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Hardened Material     |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
|       |             | Others (non-metallic) |        |    |      |      |    |     |      |    |    |          |     |     |     |                  |     |     |                          |     |     |                  |     |     |     |     |     |     |     |     |
| Shape | Item Number | EPSR                  | IC     | S  | AN   | RE   | D1 | D2  | INSL | S1 | W1 | BIDEMICS |     |     | NTK | Alumina Ceramics |     |     | Silicon Nitride Ceramics |     |     | Whisker Ceramics |     |     |     |     |     |     |     |     |
|       | CECC        |                       |        |    |      |      |    |     |      |    |    | PVD      | PVD |     | PVD |                  |     |     |                          |     |     | CVD              |     |     |     |     |     |     |     |     |
|       | Metric      | °                     | mm     | mm | °    | mm   | mm | mm  | mm   | mm | mm | 120      | JP2 | JP1 | JP3 | 450              | HC1 | HW2 | HC2                      | HC4 | HC6 | HC7              | ZC7 | SX3 | SX5 | SX7 | SX9 | SX6 | SP9 | WA1 |
|       |             | SDCW120408T01020      | T01020 | 90 | 12.7 | 4.76 | 15 | 0.8 | 5.5  | -  | -  | -        | -   | -   | -   | -                | -   | -   | -                        | -   | -   | -                | -   | -   | -   | -   | -   | -   | -   | -   |

SDCW-AE Insert Ceramic Wiper : The insert must be installed in all insert pockets

|  |  |                  |              |          |    |       |      |      |     |     |      |                          |     |     |         |  |
|--|--|------------------|--------------|----------|----|-------|------|------|-----|-----|------|--------------------------|-----|-----|---------|--|
|  |  |                  |              |          |    |       |      |      |     |     |      | Silicon Nitride Ceramics |     |     | Carbide |  |
|  |  | Item Number      | Chip-breaker | Wiper    | AN | BS    | IC   | PSIR | REL | RER | S    | SX6                      | SP9 | DM4 |         |  |
|  |  |                  |              |          | °  | mm    | mm   | °    | mm  | mm  | mm   |                          |     |     |         |  |
|  |  | SDCW1204AET01020 | No           | Straight | 15 | (2.4) | 12.7 | 45   | 1.2 | 1.2 | 4.76 |                          |     |     |         |  |

SDW Insert CBN Wiper : Can install 1 or 2 CBN Wiper inserts with ceramic insert

|  |  |                |              |       |    |       |     |     |      |      |      |     |     |
|--|--|----------------|--------------|-------|----|-------|-----|-----|------|------|------|-----|-----|
|  |  |                |              |       |    |       |     |     |      |      |      | CBN |     |
|  |  | Item Number    | Chip-breaker | Wiper | AN | BS    | BSR | LE  | PSIR | S    | W1   | B30 | B52 |
|  |  |                |              |       | °  | mm    | mm  | mm  | °    | mm   | mm   |     |     |
|  |  | SDW1204-45-50R | No           | Arch  | 15 | (4.8) | 250 | 1.5 | 45   | 4.76 | 12.2 |     |     |