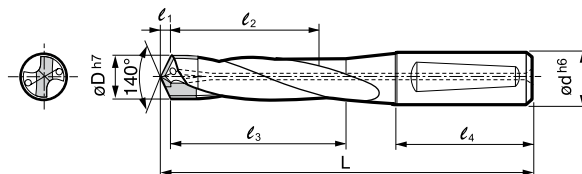


# Brazed Carbide MULTI-DRILLS

## KDS ... MAK Type

### Short Type (3 x D)

Brazed Carbide Drills with Coolant Holes



Helix angle: 20°  
 $l_2$  = Effective drilling length

#### ● Diameter ø9,5~15,5mm

| Dimensions (mm)  |       |                |                                 | Cat. No.    | Short Series (3D) |                 |                |                |
|--|-------|----------------|---------------------------------|-------------|-------------------|-----------------|----------------|----------------|
| øD<br>(mm)   | Shank |                | Drill<br>Head<br>ℓ <sub>1</sub> |             | Stock             | Dimensions (mm) |                |                |
|  | ød    | ℓ <sub>4</sub> |                                 |             | MAK               | L               | ℓ <sub>2</sub> | ℓ <sub>3</sub> |
| 9,5~<br>10,0<br>~10,5  | 16    | 48             | 1,8                             | KDS 095 MAK |                   | 96,8            | 32             | 37             |
|  |       |                |                                 | KDS 100 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 105 MAK |                   |                 |                |                |
| 10,6~<br>11,0<br>~11,5   | 16    | 48             | 2                               | KDS 106 MAK |                   | 102,0           | 35             | 40             |
|  |       |                |                                 | KDS 110 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 115 MAK |                   |                 |                |                |
| 11,6<br>11,7<br>11,8<br>11,9<br>12,0<br>12,1<br>12,2<br>12,3<br>12,4<br>12,5 | 16    | 48             | 2,2                             | KDS 116 MAK |                   | 107,2           | 38             | 44             |
|  |       |                |                                 | KDS 117 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 118 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 119 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 120 MAK | ●                 |                 |                |                |
|  |       |                |                                 | KDS 121 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 122 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 123 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 124 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 125 MAK | ●                 |                 |                |                |
| 12,6<br>12,7<br>12,8<br>12,9<br>13,0<br>13,1<br>13,2<br>13,3<br>13,4<br>13,5 | 16    | 48             | 2,4                             | KDS 126 MAK |                   | 112,4           | 41             | 47             |
|  |       |                |                                 | KDS 127 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 128 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 129 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 130 MAK | ●                 |                 |                |                |
|  |       |                |                                 | KDS 131 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 132 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 133 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 134 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 135 MAK | ●                 |                 |                |                |
| 13,6<br>13,7<br>13,8<br>13,9<br>14,0<br>14,1<br>14,2<br>14,3<br>14,4<br>14,5 | 16    | 48             | 2,5                             | KDS 136 MAK | ●                 | 117,5           | 44             | 51             |
|  |       |                |                                 | KDS 137 MAK | ●                 |                 |                |                |
|  |       |                |                                 | KDS 138 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 139 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 140 MAK | ●                 |                 |                |                |
|  |       |                |                                 | KDS 141 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 142 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 143 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 144 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 145 MAK | ●                 |                 |                |                |
| 14,6<br>14,7<br>14,8<br>14,9<br>15,0<br>15,1<br>15,2<br>15,3<br>15,4<br>15,5 | 20    | 50             | 2,7                             | KDS 146 MAK | ●                 | 127,7           | 47             | 54             |
|  |       |                |                                 | KDS 147 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 148 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 149 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 150 MAK | ●                 |                 |                |                |
|  |       |                |                                 | KDS 151 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 152 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 153 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 154 MAK |                   |                 |                |                |
|  |       |                |                                 | KDS 155 MAK | ●                 |                 |                |                |

#### ● Diameter ø15,6~20,0mm

| Dimensions (mm) |       |          |                           | Cat. No.    | Short Series (3D) |                 |          |          |
|-----------------|-------|----------|---------------------------|-------------|-------------------|-----------------|----------|----------|
| øD<br>(mm)      | Shank |          | Drill<br>Head<br>$\ell_1$ |             | Stock             | Dimensions (mm) |          |          |
|                 | ød    | $\ell_4$ |                           |             | MAK               | L               | $\ell_2$ | $\ell_3$ |
| 15,6            |       |          |                           | KDS 156 MAK |                   | 132,9           | 50       | 58       |
| 15,7            |       |          |                           | KDS 157 MAK |                   |                 |          |          |
| 15,8            |       |          |                           | KDS 158 MAK |                   |                 |          |          |
| 15,9            |       |          |                           | KDS 159 MAK |                   |                 |          |          |
| 16,0            | 20    | 50       | 2,9                       | KDS 160 MAK | ●                 |                 |          |          |
| 16,1            |       |          |                           | KDS 161 MAK |                   |                 |          |          |
| 16,2            |       |          |                           | KDS 162 MAK |                   |                 |          |          |
| 16,3            |       |          |                           | KDS 163 MAK |                   |                 |          |          |
| 16,4            |       |          |                           | KDS 164 MAK | ●                 |                 |          |          |
| 16,5            |       |          |                           | KDS 165 MAK | ●                 |                 |          |          |
| 16,6            |       |          |                           | KDS 166 MAK |                   | 138,1           | 53       | 61       |
| 16,7            |       |          |                           | KDS 167 MAK |                   |                 |          |          |
| 16,8            |       |          |                           | KDS 168 MAK |                   |                 |          |          |
| 16,9            |       |          |                           | KDS 169 MAK |                   |                 |          |          |
| 17,0            | 20    | 50       | 3,1                       | KDS 170 MAK | ●                 |                 |          |          |
| 17,1            |       |          |                           | KDS 171 MAK |                   |                 |          |          |
| 17,2            |       |          |                           | KDS 172 MAK |                   |                 |          |          |
| 17,3            |       |          |                           | KDS 173 MAK |                   |                 |          |          |
| 17,4            |       |          |                           | KDS 174 MAK |                   |                 |          |          |
| 17,5            |       |          |                           | KDS 175 MAK | ●                 |                 |          |          |
| 17,6            |       |          |                           | KDS 176 MAK |                   | 143,3           | 56       | 65       |
| 17,7            |       |          |                           | KDS 177 MAK | ●                 |                 |          |          |
| 17,8            |       |          |                           | KDS 178 MAK |                   |                 |          |          |
| 17,9            |       |          |                           | KDS 179 MAK |                   |                 |          |          |
| 18,0            | 20    | 50       | 3,3                       | KDS 180 MAK | ●                 |                 |          |          |
| 18,1            |       |          |                           | KDS 181 MAK |                   |                 |          |          |
| 18,2            |       |          |                           | KDS 182 MAK |                   |                 |          |          |
| 18,3            |       |          |                           | KDS 183 MAK |                   |                 |          |          |
| 18,4            |       |          |                           | KDS 184 MAK |                   |                 |          |          |
| 18,5            |       |          |                           | KDS 185 MAK | ●                 |                 |          |          |
| 18,6            |       |          |                           | KDS 186 MAK |                   | 158,5           | 59       | 68       |
| 18,7            |       |          |                           | KDS 187 MAK | ●                 |                 |          |          |
| 18,8            |       |          |                           | KDS 188 MAK |                   |                 |          |          |
| 18,9            |       |          |                           | KDS 189 MAK |                   |                 |          |          |
| 19,0            | 25    | 56       | 3,5                       | KDS 190 MAK | ●                 |                 |          |          |
| 19,1            |       |          |                           | KDS 191 MAK |                   |                 |          |          |
| 19,2            |       |          |                           | KDS 192 MAK |                   |                 |          |          |
| 19,3            |       |          |                           | KDS 193 MAK |                   |                 |          |          |
| 19,4            |       |          |                           | KDS 194 MAK |                   |                 |          |          |
| 19,5            |       |          |                           | KDS 195 MAK | ●                 |                 |          |          |
| 19,6            |       |          |                           | KDS 196 MAK |                   | 158,6           | 62       | 72       |
| 19,7            |       |          |                           | KDS 197 MAK |                   |                 |          |          |
| 19,8            | 25    | 56       | 3,6                       | KDS 198 MAK |                   |                 |          |          |
| 19,9            |       |          |                           | KDS 199 MAK |                   |                 |          |          |
| 20,0            |       |          |                           | KDS 200 MAK | ●                 |                 |          |          |

#### ■ Recommended Cutting Conditions

( $v_c$  : Cutting Speed (m/min),  $f$  : Feed rate (mm/rev)) (Min – Standard – Max)

| Diameter<br>(mm) |       | Steels<br>(under HB250) | Steels<br>(HB250~320) | Hardened Steels<br>(HRC45) | Stainless Steels<br>( < HB200) | Ductile<br>Cast Irons | Cast Irons    | Aluminium<br>Alloys | Titanium Alloys<br>(Ti-6Al-4V) | Inconel<br>(Inconel 718) |
|------------------|-------|-------------------------|-----------------------|----------------------------|--------------------------------|-----------------------|---------------|---------------------|--------------------------------|--------------------------|
| ~ ø15            | $v_c$ | 50 – 65 – 75            | 50 – 60 – 70          | 30 – 35 – 45               | 35 – 45 – 50                   | 55 – 65 – 75          | 60 – 80 – 100 | 70 – 85 – 100       | 20 – 25 – 35                   | 10 – 20 – 30             |
|                  | $f$   | 0,15 – 0,3              | 0,15 – 0,3            | 0,1 – 0,2                  | 0,1 – 0,2                      | 0,15 – 0,3            | 0,2 – 0,3     | 0,25 – 0,35         | 0,1 – 0,15                     | 0,08 – 0,1               |
| ~ ø20            | $v_c$ | 50 – 65 – 75            | 50 – 60 – 70          | 35 – 40 – 50               | 35 – 45 – 50                   | 60 – 70 – 80          | 60 – 80 – 100 | 70 – 90 – 110       | 20 – 30 – 40                   | 10 – 20 – 30             |
|                  | $f$   | 0,15 – 0,35             | 0,15 – 0,35           | 0,15 – 0,25                | 0,15 – 0,25                    | 0,15 – 0,35           | 0,2 – 0,35    | 0,25 – 0,4          | 0,1 – 0,15                     | 0,08 – 0,1               |
| ~ ø30,5          | $v_c$ | 55 – 70 – 90            | 55 – 65 – 90          | 35 – 40 – 50               | 35 – 45 – 50                   | 60 – 70 – 90          | 60 – 90 – 110 | 75 – 100 – 120      | 25 – 35 – 40                   | 15 – 25 – 35             |
|                  | $f$   | 0,2 – 0,4               | 0,2 – 0,4             | 0,15 – 0,25                | 0,15 – 0,25                    | 0,2 – 0,4             | 0,25 – 0,4    | 0,3 – 0,4           | 0,1 – 0,2                      | 0,08 – 0,12              |

If the drilling operation is completely satisfactory with the above condition and the rigidity of the machine is sufficient, the cutting data can be raised. For more guidance, please contact our technical representative.

● = Euro stock