

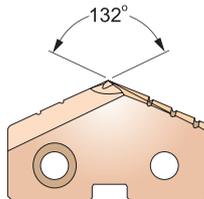
YG SPADE DRILLS

SERIES 2

SM-POINT SPADE DRILL INSERTS FOR CAST IRON - CARBIDE(K10)
SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL(K10)

- ▶ High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- ▶ Improved stability and hole straightness by newly developed thinning design.
- ▶ Less thrust force and excellent self-centering.
- ▶ Any non-standard size available.

- ▶ Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- ▶ Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschnidengeometrie
- ▶ Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- ▶ Jede Abmessung außerhalb des Kataloges lieferbar



cutting conditions : P.326

| Series Min. to Max. (mm/inch) | Diameter | | | Thick Metric (mm/inch) | EDP No. | | |
|---|----------------|----------------|-------------------|------------------------------|---------------|----------|----------|
| | Inch (inch) | Metric (mm) | Decimal (inch) | | CARBIDE (K10) | | |
| | | | | | TiN | TiCN | TiAlN |
| 2 24.41 (.961") to 35.05 (1.380") | 31/32" | 24.61 | .9688" | 4.8 (3/16") | SM605062 | SM610062 | SM615062 |
| | 63/64" | 25.00 | .9843" | | SM655250 | SM660250 | SM665250 |
| | 1" | 25.40 | 1.0000" | | SM605100 | SM610100 | SM615100 |
| | 1-1/64" | 25.80 | 1.0156" | | SM605101 | SM610101 | SM615101 |
| | | 26.00 | 1.0236" | | SM655260 | SM660260 | SM665260 |
| | 1-1/32" | 26.19 | 1.0312" | | SM605102 | SM610102 | SM615102 |
| | 1-3/64" | 26.59 | 1.0469" | | SM605103 | SM610103 | SM615103 |
| | 1-1/16" | 26.99 | 1.0625" | | SM605104 | SM610104 | SM615104 |
| | | 27.00 | 1.0630" | | SM655270 | SM660270 | SM665270 |
| | 1-3/32" | 27.78 | 1.0938" | | SM605106 | SM610106 | SM615106 |
| | | 28.00 | 1.1024" | | SM655280 | SM660280 | SM665280 |
| | 1-7/64" | 28.18 | 1.1094" | | SM605107 | SM610107 | SM615107 |
| | 1-1/8" | 28.58 | 1.1250" | | SM605108 | SM610108 | SM615108 |
| | | 29.00 | 1.1417" | | SM655290 | SM660290 | SM665290 |
| | 1-5/32" | 29.37 | 1.1562" | | SM605110 | SM610110 | SM615110 |
| | | 30.00 | 1.1811" | | SM655300 | SM660300 | SM665300 |
| | 1-3/16" | 30.16 | 1.1875" | | SM605112 | SM610112 | SM615112 |
| | 1-7/32" | 30.96 | 1.2188" | | SM605114 | SM610114 | SM615114 |
| | | 31.00 | 1.2205" | | SM655310 | SM660310 | SM665310 |
| | 1-1/4" | 31.75 | 1.2500" | | SM605116 | SM610116 | SM615116 |
| | 32.00 | 1.2598" | SM655320 | SM660320 | SM665320 | | |
| 1-9/32" | 32.54 | 1.2812" | SM605118 | SM610118 | SM615118 | | |
| | 33.00 | 1.2992" | SM655330 | SM660330 | SM665330 | | |
| 1-5/16" | 33.34 | 1.3125" | SM605120 | SM610120 | SM615120 | | |
| | 34.00 | 1.3386" | SM655340 | SM660340 | SM665340 | | |
| 1-11/32" | 34.13 | 1.3438" | SM605122 | SM610122 | SM615122 | | |
| 1-3/8" | 34.93 | 1.3750" | SM605124 | SM610124 | SM615124 | | |
| | 35.00 | 1.3780" | SM655350 | SM660350 | SM665350 | | |

◎ : Excellent ○ : Good

| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
|---|-----------------|-----------------|------------------|-----------------|---------------------|-----------------|-------------------|-----------------|------------------|-----------------|------------------|-----------------|-----------------|------------------|----------------|
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (~HB275~) | ~HRc28 (~HB275) | HRc28~ (~HB275~) | ~HRc37 (~HB350) | HRc37~ (~HB350~) | ~HRc24 (~HB250) | HRc24~ (~HB250~) | ~HRc13 (~HB200) | HRc13~ (~HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (~HB220~) | ~HRc8 (~HB180) |
| | | | | | | | | | | | | ◎ | ◎ | | |



DRILL INSERT (METRIC) - CARBIDE
BOHREINSATZ (METRISCH) - VOLLHARTMETALL

| Material | Material Hardness | | CARBIDE Grade | Speed (M/min) | | | Feed (mm/rev) | | | | |
|--|-------------------|---------|---------------|---------------|------|-------|----------------|---------------|-------------|-------------|-------------|
| | (Bhn) | (HRc) | | TiN | TiCN | TiAlN | Ø 9.5 ~12.5 | Ø 13 ~17.5 | Ø 18 ~24 | Ø 25 ~35 | Ø 36 ~47 |
| Free machining Steels 9SMn36, 9SMnPb28 10SPb20 etc | 100 - 150 | | P40 | 101 | 113 | 125 | 0.18 | 0.28 | 0.36 | 0.44 | 0.50 |
| | 150 - 200 | - 13 | P40 | 88 | 99 | 110 | 0.16 | 0.26 | 0.33 | 0.39 | 0.45 |
| | 200 - 250 | 13 - 24 | P40 | 82 | 88 | 101 | 0.14 | 0.23 | 0.31 | 0.41 | 0.42 |
| Low Carbon Steels C10, C15, C22, C25 etc | 85 - 125 | | P40 | 94 | 110 | 119 | 0.20 | 0.24 | 0.31 | 0.42 | 0.46 |
| | 125 - 175 | - 7 | P40 | 82 | 88 | 107 | 0.18 | 0.24 | 0.31 | 0.39 | 0.43 |
| | 175 - 225 | 7 - 20 | P40 | 76 | 82 | 96 | 0.15 | 0.22 | 0.29 | 0.36 | 0.40 |
| Medium Carbon Steels C35, C40, C45 etc | 225 - 275 | 20 - 28 | P40 | 62 | 73 | 84 | 0.13 | 0.22 | 0.29 | 0.36 | 0.40 |
| | 125 - 175 | - 7 | P40 | 82 | 88 | 102 | 0.17 | 0.24 | 0.31 | 0.37 | 0.42 |
| | 175 - 225 | 7 - 20 | P40 | 75 | 84 | 93 | 0.15 | 0.22 | 0.28 | 0.36 | 0.40 |
| Structural Steels St33, St37-2, St44-2 St52, St60 etc | 225 - 275 | 20 - 28 | P40 | 66 | 70 | 84 | 0.15 | 0.22 | 0.28 | 0.36 | 0.40 |
| | 275 - 325 | 28 - 34 | P40 | 56 | 64 | 67 | 0.13 | 0.19 | 0.26 | 0.33 | 0.37 |
| | 100 - 150 | | P40 | 75 | 82 | 91 | 0.19 | 0.26 | 0.34 | 0.39 | 0.43 |
| Cast Iron / S,G Iron GG10, 20, 25, 35, 40 GGG50, 70 GTW35, GTS70 etc | 150 - 250 | - 24 | P40 | 62 | 70 | 75 | 0.15 | 0.24 | 0.29 | 0.33 | 0.37 |
| | 250 - 350 | 24 - 37 | P40 | 55 | 64 | 73 | 0.13 | 0.23 | 0.27 | 0.29 | 0.33 |
| | 120 - 150 | | K20,K10 | 98 | 125 | 137 | 0.18 | 0.30 | 0.37 | 0.46 | 0.56 |
| | 150 - 200 | - 13 | K20,K10 | 95 | 101 | 125 | 0.17 | 0.26 | 0.32 | 0.42 | 0.53 |
| Alloy Steels 45CrNiMo4, 42CrMo4 16MnCr5, Ck75 35CrMo4, 16MnCr5 etc | 200 - 220 | 13 - 19 | K20,K10 | 75 | 91 | 111 | 0.14 | 0.23 | 0.30 | 0.38 | 0.45 |
| | 220 - 260 | 19 - 26 | K20,K10 | 66 | 81 | 93 | 0.13 | 0.15 | 0.28 | 0.33 | 0.37 |
| | 260 - 320 | 26 - 34 | K20,K10 | 56 | 70 | 79 | 0.13 | 0.18 | 0.23 | 0.28 | 0.33 |
| | 125 - 175 | - 7 | P40 | 79 | 85 | 98 | 0.18 | 0.25 | 0.32 | 0.40 | 0.45 |
| Tool Steels 102Cr6, 105WCr6, C75W etc | 175 - 225 | 7 - 20 | P40 | 73 | 81 | 88 | 0.15 | 0.23 | 0.29 | 0.38 | 0.42 |
| | 225 - 275 | 20 - 28 | P40 | 66 | 73 | 81 | 0.15 | 0.21 | 0.28 | 0.37 | 0.41 |
| | 275 - 325 | 28 - 34 | P40 | 62 | 70 | 78 | 0.12 | 0.20 | 0.27 | 0.33 | 0.40 |
| | 325 - 375 | 34 - 40 | P40 | 53 | 58 | 64 | 0.10 | 0.18 | 0.23 | 0.30 | 0.38 |
| High Temp. Alloy Hastelloy B, Inconel etc | 150 - 200 | - 13 | P40 | 50 | 56 | 67 | 0.09 | 0.18 | 0.22 | 0.28 | 0.31 |
| | 200 - 250 | 13 - 24 | P40 | 37 | 46 | 50 | 0.09 | 0.18 | 0.22 | 0.28 | 0.31 |
| High Strength Alloy 36CrNiMo4, 34CrNiMo8 40NiCrMo73 etc | 140 - 220 | - 19 | K20 | 26 | 27 | 30 | 0.10 | 0.17 | 0.23 | 0.27 | 0.33 |
| | 220 - 310 | 19 - 33 | K20 | 20 | 23 | 24 | 0.10 | 0.14 | 0.20 | 0.24 | 0.30 |
| | 225 - 300 | - 32 | P40 | 49 | 55 | 62 | 0.15 | 0.23 | 0.25 | 0.29 | 0.38 |
| Aluminum AlCuSiMn, AlMgSi0.5, AlZnMgCu1.5 etc | 300 - 350 | 32 - 37 | P40 | 43 | 49 | 55 | 0.12 | 0.20 | 0.23 | 0.27 | 0.35 |
| | 350 - 400 | 37 - 43 | P40 | 38 | 43 | 47 | 0.10 | 0.18 | 0.20 | 0.24 | 0.30 |
| Stainless Steels X7Cr13, X10CrAl18, X5CrNi189, X5CrNiMo18 10 etc | 30 | | K20 | 366 | 396 | 427 | 0.24 | 0.38 | 0.45 | 0.50 | 0.53 |
| | 180 | - 8 | K20 | 244 | 290 | 291 | 0.22 | 0.33 | 0.40 | 0.45 | 0.48 |
| | 135 - 185 | - 9 | K20 | 50 | 55 | 62 | 0.19 | 0.19 | 0.21 | 0.24 | 0.30 |
| | 185 - 275 | 9 - 28 | K20 | 38 | 44 | 46 | 0.15 | 0.17 | 0.20 | 0.21 | 0.25 |

RPM= revolution per minute (rev/min)
M/min= surface meter per minute(M/min)
DIA= diameter of drill (mm)
mm/rev = feed rate(mm/rev)

*** Formulas :**

$$M/min = \frac{(RPM) \cdot (\pi) \cdot (DIA.)}{1000}$$

$$mm/min= (RPM) \cdot (mm/rev)$$

$$RPM = \frac{(M/min) \cdot (1000)}{(\pi) \cdot (DIA.)}$$

The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.