

# Cutting Tools

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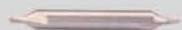
|          |          |
|----------|----------|
| Model    | AX       |
| Material | Aluminum |
| Length   | 100 mm   |
| Weight   | 1.5 kg   |



I01-I40

I01~28

## Fast Drill



68000 I01



68010 I01



68020 I02



68030 I02



68040 I03



68050 I04



68060 I05



68070 I06



68080 I07



68090 I08



68100 I09



68110 I10



68120 I11



68130 I12



68140 I15



68150 I17



68160 I19



68170 I21



68180 I23



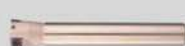
68190 I24



68210 I25



68220 I26



68230 I27



68240 I28

I29~40

## Face End Mill



68250 I29



68280 I30



68290 I30



68300 I31



68310 I32



68320 I33



68330 I34



68340 I34



68350 I35



68370 I36



68390 I37



68400 I38



68410 I39



68420 I40

# Deburring Tool

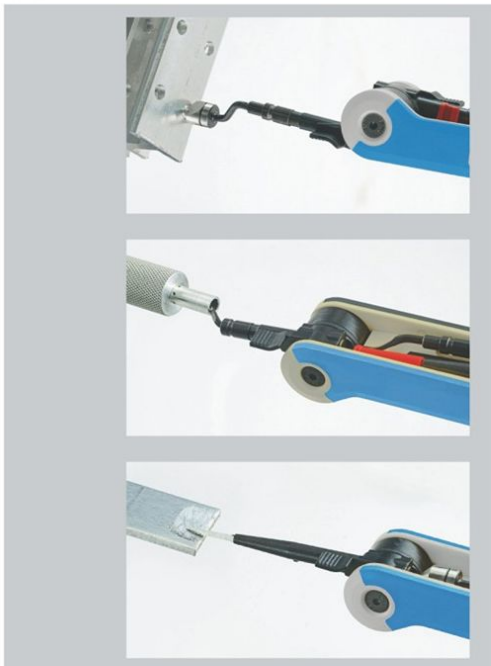
**67000**

**RG1000**

**NOGA MULTIBURR SET**



Applications:

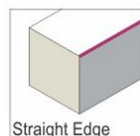


## MULTIBURR

**RG1000**

The handy universal deburring set with multipurpose blades will help you produce a perfect finish for wide variety of jobs.

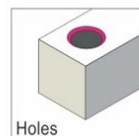
This innovative tool set has 4 folding shafts which can be easily locked into position for the duration of the work and then folded neatly back into the handle allowing the tool to be carried simply anywhere.



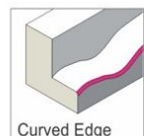
Straight Edge



Bushing Scraping

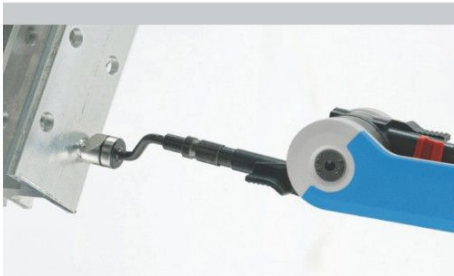


Holes



Curved Edge

## Demostration for Deburring Systems



# Deburring Tool

**67010** NG1910 >> NOGA Non Scratch



## Non Scratch

**NG1910** Tool with non scratch blade with safety cap  
Removing burrs from workpieces may sometimes leave unsightly scratches, Noga's NG-1 handle with the NEW non scratch blade with safety cap will prevent friction therefore eliminating scratches. Works best on steel, aluminum



INCLUDES:

**NG1000** NG-1 Handle



**67012** NG1000 >>

**BS9110** Non scratch HSS Blade with safety cap  
Plastic safety cap will protect workpiece surface from scratches



**67014** BS9110 >>

**67020**
**CR1500**
**Mini Ceramic Handle and Convexed Blade**

### Ceramic Tool

#### CR1500 Mini Ceramic Handle and Convexed Blade

A unique mini plastic handle and convexed ceramic blade, perfect for plastic materials and soft metals. Ideal for surface scraping and parting line deflashing.


**67022**
**CR1400**

#### INCLUDES:

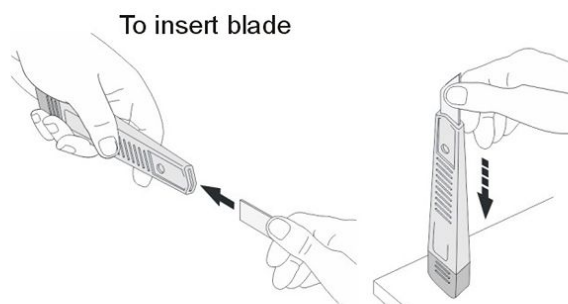
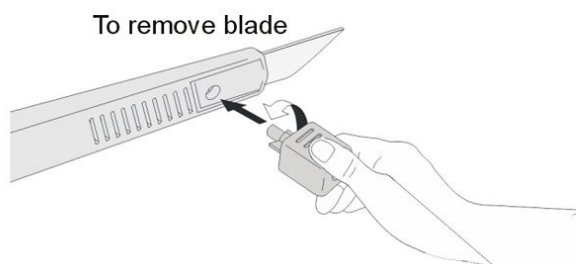
##### CR1400 Mini Handle

A unique plastic handle that holds blade by its self-gripping taper. Storage space for spare blades.


**67024**
**CR1550**

#### CR1550 Mini Ceramic Convexed Blade

surface cleaning, trimming on small parts deburring and parting line deflashing.



## Deburring Tool

**67030**

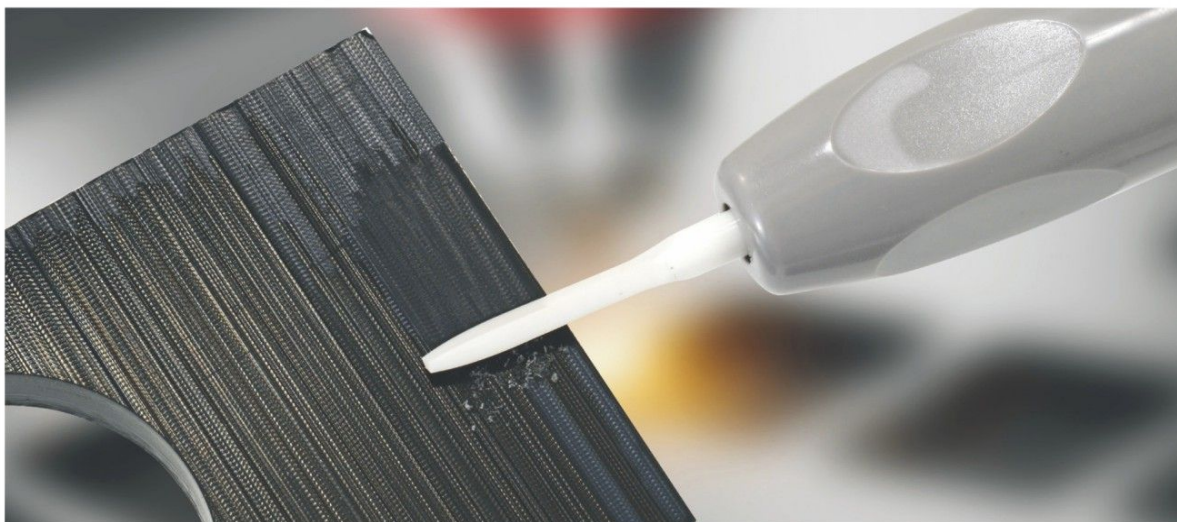
CR4100

Adjustable Ceramic Mini Scraper

### Ceramic Tool

#### CR4100 Adjustable Ceramic Mini Scraper

Ceramic mini scraper ideal for surface cleaning, trimming deburring and parting line deflashing on most plastics. Special blade design for safety.



**67032**

YT10004

INCLUDES:

#### YT10004 Mini Scraper Handle

The perfect grip for adjustable ceramic mini scrapers



**67034**

CR4500

#### CR4500 Ceramic Convex Blade

Fine ceramic mini-scraper blade

Spec: 4x50mm



**67040**
**FT3000**
**NOGA Micro Deburring Set**


**FT3000** Noga Micro Deburring Set  
A set containing Noga three micro tools  
Ideal for Tool and Die maker for extra  
fine jobs.

INCLUDES:  
FT10001-S150 blade  
FT11001-D50 scraper blade.  
FT12001-3.2mm countersink blade  
(Blades are not replaceable)


**67041**
**FT10001**
**FT10001-S150 blade**

A tool with finest HSS blade S150 for extra fine jobs.


**67042**
**FT11001**
**FT11001-D50 Scraper blade**

Fine triangular Hss mini-scraper ideal for Tool and Die  
maker.


**67043**
**FT12001**
**FT12001-3.2mm countersink blade**

Deburs and Countersinks small holes 0-3mm



## Cutting Tool

### RAPID DRILL FEATURES

|                      | Content                                                                                               | WDX RAPID DRILL                               |
|----------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Tools                | Material                                                                                              | SKD61, Durable and stable                     |
|                      | Facility                                                                                              | 5 axis machining, high quality and accuracy.  |
| Inserts              | Brand                                                                                                 | SUMITOMO                                      |
|                      | Types                                                                                                 | Quadrangle                                    |
|                      | Flutes                                                                                                | 4 flutes (Center flutes x 2, side flutes x 2) |
|                      | Workpieces                                                                                            | Depending on workpieces                       |
| Drilling Performance | Workpiece Bottom                                                                                      | Almost flat                                   |
|                      | Chip removal<br>SS400 Coolant through                                                                 | Slices                                        |
|                      | Insert Lifecycle                                                                                      | Excellent                                     |
|                      | Efficiency                                                                                            | Excellent                                     |
|                      | CNC Lathe                                                                                             | ●                                             |
|                      | CNC Milling                                                                                           | ●                                             |
|                      | CNC Eccentric Lathe                                                                                   | ●                                             |
|                      |  Flat Drilling     | ●                                             |
|                      |  Tilt Drilling     | ●                                             |
|                      |  Convex Drilling   | ●                                             |
|                      |  Concave Drilling  | ●                                             |
|                      |  Cross Drilling    | ●                                             |
|                      |  Fish Eye Drilling | ●                                             |
|                      |  Side Drilling     | ●                                             |

If it is with coolant through design, it will be more effective.



CUTTING TOOL

## WDXT >> INSERTS TYPES

| L                                                                                 | G                                                                                 | H                                                                                  | G-DL1500                                                                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| Slow feed, used for cutting                                                       | General type                                                                      | Strong flutes for high rigidity                                                    | For aluminum                                                                        |

| Insert Material | Workpieces                             |
|-----------------|----------------------------------------|
| ACP300          | <b>P</b> (General cutting) <b>M</b>    |
| ACK300          | <b>P</b> (High speed cutting) <b>K</b> |
| DL1500          | <b>N</b>                               |

Capability of inserts in cutting.

| Recommend | Model    | Workpieces        | Features                                                    |
|-----------|----------|-------------------|-------------------------------------------------------------|
| Priority  | G-ACP300 | <b>P</b> <b>M</b> | Normal steel, alloy steel, stainless steel                  |
|           | G-ACK300 | <b>P</b> <b>K</b> | Casting Iron or normal steel, alloy steel, stainless steel. |
|           | G-DL1500 | <b>N</b>          | For non-metal and aluminum                                  |
| Second    | L-ACP300 | <b>P</b> <b>M</b> | SS400,SCM415,SCM440...                                      |
|           | L-ACK300 | <b>P</b> <b>K</b> | Low carbon alloy steel wear resistance than with            |
|           | H-ACP300 | <b>P</b> <b>K</b> | For high rigid or non-continuous cutting.                   |
|           | H-ACK300 | <b>K</b>          | For high rigid or non-continuous cutting.                   |

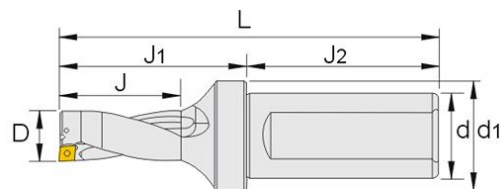


# Cutting Tool

**68140**

**WDX-2D**

**Rapid Drill (2D)**



90° Unit:mm

| Order No. | Model              | D    | L   | J  | J1 | J2 | d  | d1   | Deviation | Inserts    | Wrench | Screw           |
|-----------|--------------------|------|-----|----|----|----|----|------|-----------|------------|--------|-----------------|
| 68140-01  | WDX13 -C25-2D-26L  | 13   | 106 | 26 | 50 | 56 | 25 | 32   | 0.35      | WDXT042004 | T6     | M1.8-3.0-2.4-60 |
| 68140-02  | WDX13.5-C25-2D-28L | 13.5 | 106 | 27 | 50 | 56 | 25 |      | 0.30      |            |        |                 |
| 68140-03  | WDX14 -C25-2D-28L  | 14   | 108 | 28 | 52 | 56 | 25 |      | 0.25      |            |        |                 |
| 68140-04  | WDX14.5-C25-2D-30L | 14.5 | 108 | 29 | 52 | 56 | 25 |      | 0.20      |            |        |                 |
| 68140-05  | WDX15 -C25-2D-30L  | 15   | 110 | 30 | 54 | 56 | 25 |      | 0.15      |            |        |                 |
| 68140-06  | WDX15.5-C25-2D-32L | 15.5 | 110 | 31 | 54 | 56 | 25 |      | 0.40      | WDXT052504 | T6     | M2.0-5.0-2.7-60 |
| 68140-07  | WDX16 -C25-2D-32L  | 16   | 112 | 32 | 56 | 56 | 25 |      | 0.40      |            |        |                 |
| 68140-08  | WDX16.5-C25-2D-34L | 16.5 | 112 | 33 | 56 | 56 | 25 |      | 0.35      |            |        |                 |
| 68140-09  | WDX17 -C25-2D-34L  | 17   | 114 | 34 | 58 | 56 | 25 |      | 0.30      |            |        |                 |
| 68140-10  | WDX17.5-C25-2D-36L | 17.5 | 114 | 35 | 58 | 56 | 25 |      | 0.25      |            |        |                 |
| 68140-11  | WDX18 -C25-2D-36L  | 18   | 116 | 36 | 60 | 56 | 25 | 32   | 0.20      | WDXT063006 | T7     | M2.2-5.5-3.4-60 |
| 68140-12  | WDX18.5-C25-2D-38L | 18.5 | 116 | 37 | 60 | 56 | 25 |      | 0.50      |            |        |                 |
| 68140-13  | WDX19 -C25-2D-38L  | 19   | 118 | 38 | 62 | 56 | 25 |      | 0.45      |            |        |                 |
| 68140-14  | WDX19.5-C25-2D-40L | 19.5 | 118 | 39 | 62 | 56 | 25 |      | 0.40      |            |        |                 |
| 68140-15  | WDX20 -C25-2D-40L  | 20   | 120 | 40 | 64 | 56 | 25 |      | 0.30      |            |        |                 |
| 68140-16  | WDX20.5-C25-2D-42L | 20.5 | 120 | 41 | 64 | 56 | 25 |      | 0.30      | WDXT073506 | T8     | M2.5-6.0-3.5-60 |
| 68140-17  | WDX21 -C25-2D-42L  | 21   | 122 | 42 | 66 | 56 | 25 |      | 0.20      |            |        |                 |
| 68140-18  | WDX21.5-C25-2D-44L | 21.5 | 122 | 43 | 66 | 56 | 25 |      | 0.15      |            |        |                 |
| 68140-19  | WDX22 -C25-2D-44L  | 22   | 124 | 44 | 68 | 56 | 25 |      | 0.10      |            |        |                 |
| 68140-20  | WDX22.5-C25-2D-46L | 22.5 | 124 | 45 | 68 | 56 | 25 |      | 0.05      |            |        |                 |
| 68140-21  | WDX23 -C25-2D-46L  | 23   | 126 | 46 | 70 | 56 | 25 | 38.5 | 0.70      | WDXT073506 | T8     | M2.5-6.0-3.5-60 |
| 68140-22  | WDX23.5-C32-2D-47L | 23.5 | 130 | 47 | 70 | 60 | 32 |      | 0.70      |            |        |                 |
| 68140-23  | WDX24 -C32-2D-48L  | 24   | 132 | 48 | 72 | 60 | 32 |      | 0.60      |            |        |                 |
| 68140-24  | WDX24.5-C32-2D-50L | 24.5 | 132 | 49 | 72 | 60 | 32 |      | 0.50      |            |        |                 |
| 68140-25  | WDX25 -C32-2D-50L  | 25   | 134 | 50 | 74 | 60 | 32 |      | 0.50      |            |        |                 |
| 68140-26  | WDX25.5-C32-2D-52L | 25.5 | 134 | 51 | 74 | 60 | 32 |      | 0.45      |            |        |                 |
| 68140-27  | WDX26 -C32-2D-52L  | 26   | 141 | 52 | 81 | 60 | 32 |      | 0.40      |            |        |                 |
| 68140-28  | WDX26.5-C32-2D-54L | 26.5 | 141 | 53 | 81 | 60 | 32 |      | 0.35      |            |        |                 |
| 68140-29  | WDX27 -C32-2D-54L  | 27   | 143 | 54 | 83 | 60 | 32 |      | 0.25      |            |        |                 |
| 68140-30  | WDX27.5-C32-2D-56L | 27.5 | 143 | 55 | 83 | 60 | 32 |      | 0.20      |            |        |                 |
| 68140-31  | WDX28 -C32-2D-56L  | 28   | 145 | 56 | 85 | 60 | 32 |      | 0.15      |            |        |                 |
| 68140-32  | WDX28.5-C32-2D-58L | 28.5 | 145 | 57 | 85 | 60 | 32 |      | 0.10      |            |        |                 |



CUTTING TOOL

# 68140

## WDX-2D

## Rapid Drill (2D)

Unit:mm

| Order No. | Model              | D    | L   | J   | J1  | J2 | d  | d1   | Deviation | Inserts    | Wrench | Screw            |
|-----------|--------------------|------|-----|-----|-----|----|----|------|-----------|------------|--------|------------------|
| 68140-33  | WDX29 -C32-2D-58L  | 29   | 147 | 58  | 87  | 60 | 32 | 39   | 1.00      | WDXT094008 | T15    | M3.5-8.0-5.3-60  |
| 68140-34  | WDX29.5-C32-2D-60L | 29.5 | 147 | 59  | 87  | 60 | 32 |      | 0.95      |            |        |                  |
| 68140-35  | WDX30 -C32-2D-60L  | 30   | 149 | 60  | 89  | 60 | 32 | 38.5 | 0.90      |            |        |                  |
| 68140-36  | WDX31 -C32-2D-62L  | 31   | 151 | 62  | 91  | 60 | 32 |      | 0.80      |            |        |                  |
| 68140-37  | WDX32 -C32-2D-64L  | 32   | 153 | 64  | 93  | 60 | 32 |      | 0.70      |            |        |                  |
| 68140-38  | WDX33 -C32-2D-66L  | 33   | 155 | 66  | 95  | 60 | 32 |      | 0.55      |            |        |                  |
| 68140-39  | WDX34 -C32-2D-68L  | 34   | 157 | 68  | 97  | 60 | 32 |      | 0.45      |            |        |                  |
| 68140-40  | WDX35 -C32-2D-70L  | 35   | 159 | 70  | 99  | 60 | 32 |      | 0.35      |            |        |                  |
| 68140-41  | WDX36 -C32-2D-72L  | 36   | 161 | 72  | 101 | 60 | 32 | 48   | 0.20      | WDXT125012 | T20    | M5.0-11.0-7.0-60 |
| 68140-42  | WDX37 -C32-2D-74L  | 37   | 163 | 74  | 103 | 60 | 32 |      | 1.00      |            |        |                  |
| 68140-43  | WDX38 -C32-2D-76L  | 38   | 165 | 76  | 105 | 60 | 32 |      | 1.00      |            |        |                  |
| 68140-44  | WDX39 -C32-2D-78L  | 39   | 167 | 78  | 107 | 60 | 32 |      | 0.90      |            |        |                  |
| 68140-45  | WDX40 -C40-2D-80L  | 40   | 179 | 80  | 109 | 70 | 40 |      | 0.80      |            |        |                  |
| 68140-46  | WDX41 -C40-2D-82L  | 41   | 181 | 82  | 111 | 70 | 40 |      | 0.70      |            |        |                  |
| 68140-47  | WDX42 -C40-2D-84L  | 42   | 183 | 84  | 113 | 70 | 40 |      | 0.60      |            |        |                  |
| 68140-48  | WDX43 -C40-2D-86L  | 43   | 185 | 86  | 115 | 70 | 40 |      | 0.50      |            |        |                  |
| 68140-49  | WDX44 -C40-2D-88L  | 44   | 187 | 88  | 117 | 70 | 40 | 54   | 0.50      | WDXT156012 | T25    | M6.0-15.0-9.0-60 |
| 68140-50  | WDX45 -C40-2D-90L  | 45   | 189 | 90  | 119 | 70 | 40 |      | 0.40      |            |        |                  |
| 68140-51  | WDX46 -C40-2D-92L  | 46   | 197 | 92  | 127 | 70 | 40 |      | 1.50      |            |        |                  |
| 68140-52  | WDX47 -C40-2D-94L  | 47   | 199 | 94  | 129 | 70 | 40 |      | 1.40      |            |        |                  |
| 68140-53  | WDX48 -C40-2D-96L  | 48   | 201 | 96  | 131 | 70 | 40 |      | 1.30      |            |        |                  |
| 68140-54  | WDX49 -C40-2D-98L  | 49   | 203 | 98  | 133 | 70 | 40 |      | 1.20      |            |        |                  |
| 68140-55  | WDX50 -C40-2D-100L | 50   | 205 | 100 | 135 | 70 | 40 |      | 1.10      |            |        |                  |
| 68140-56  | WDX51 -C40-2D-102L | 51   | 207 | 102 | 137 | 70 | 40 |      | 1.00      |            |        |                  |
| 68140-57  | WDX52 -C40-2D-104L | 52   | 209 | 104 | 139 | 70 | 40 | 55   | 0.90      | WDXT186012 | T25    | M6.0-15.0-9.0-60 |
| 68140-58  | WDX53 -C40-2D-106L | 53   | 211 | 106 | 141 | 70 | 40 |      | 0.80      |            |        |                  |
| 68140-59  | WDX54 -C40-2D-108L | 54   | 213 | 108 | 143 | 70 | 40 |      | 0.60      |            |        |                  |
| 68140-60  | WDX55 -C40-2D-110L | 55   | 215 | 110 | 145 | 70 | 40 |      | 0.50      |            |        |                  |
| 68140-61  | WDX56 -C40-2D-112L | 56   | 220 | 112 | 150 | 70 | 40 |      | 2.00      |            |        |                  |
| 68140-62  | WDX57 -C40-2D-114L | 57   | 222 | 114 | 152 | 70 | 40 |      | 1.80      |            |        |                  |
| 68140-63  | WDX58 -C40-2D-116L | 58   | 224 | 116 | 154 | 70 | 40 |      | 1.70      |            |        |                  |
| 68140-64  | WDX59 -C40-2D-118L | 59   | 226 | 118 | 156 | 70 | 40 |      | 1.60      |            |        |                  |
| 68140-65  | WDX60 -C40-2D-120L | 60   | 228 | 120 | 158 | 70 | 40 | 58   | 1.50      |            |        |                  |
| 68140-66  | WDX61 -C40-2D-122L | 61   | 230 | 122 | 160 | 70 | 40 | 59   | 1.40      |            |        |                  |
| 68140-67  | WDX62 -C40-2D-124L | 62   | 232 | 124 | 162 | 70 | 40 | 60   | 1.30      |            |        |                  |
| 68140-68  | WDX63 -C40-2D-126L | 63   | 234 | 126 | 164 | 70 | 40 | 61   | 1.20      |            |        |                  |
| 68140-69  | WDX64 -C40-2D-128L | 64   | 236 | 128 | 166 | 70 | 40 | 62   | 1.00      |            |        |                  |
| 68140-70  | WDX65 -C40-2D-130L | 65   | 238 | 130 | 168 | 70 | 40 | 63   | 0.90      |            |        |                  |
| 68140-71  | WDX66 -C40-2D-132L | 66   | 240 | 132 | 170 | 70 | 40 | 64   | 0.70      |            |        |                  |
| 68140-72  | WDX67 -C40-2D-134L | 67   | 242 | 134 | 172 | 70 | 40 | 65   | 0.60      |            |        |                  |
| 68140-73  | WDX68 -C40-2D-136L | 68   | 244 | 136 | 174 | 70 | 40 | 66   | 0.50      |            |        |                  |



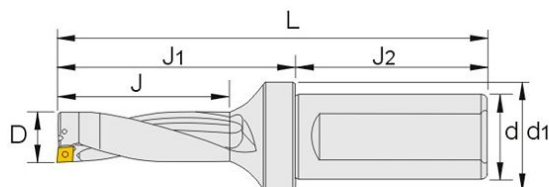
CUTTING TOOL

# Cutting Tool

**68150**

**WDX-3D**

**Rapid Drill (3D)**



90° Unit:mm

| Order No. | Model                | D    | L   | J    | J1  | J2 | d  | d1   | Deviation | Inserts    | Wrench | Screw           |
|-----------|----------------------|------|-----|------|-----|----|----|------|-----------|------------|--------|-----------------|
| 68150-01  | WDX13 -C25-3D-39L    | 13   | 119 | 39   | 63  | 56 | 25 | 32   | 0.35      | WDXT042004 | T6     | M1.8-3.0-2.4-60 |
| 68150-02  | WDX13.5-C25-3D-40.5L | 13.5 | 119 | 40.5 | 63  | 56 | 25 |      | 0.30      |            |        |                 |
| 68150-03  | WDX14 -C25-3D-42L    | 14   | 122 | 42   | 66  | 56 | 25 |      | 0.25      |            |        |                 |
| 68150-04  | WDX14.5-C25-3D-43.5L | 14.5 | 122 | 43.5 | 66  | 56 | 25 |      | 0.20      |            |        |                 |
| 68150-05  | WDX15 -C25-3D-45L    | 15   | 125 | 45   | 69  | 56 | 25 |      | 0.15      |            |        |                 |
| 68150-06  | WDX15.5-C25-3D-46.5L | 15.5 | 125 | 46.5 | 69  | 56 | 25 |      | 0.40      | WDXT052504 | T6     | M2.0-5.0-2.7-60 |
| 68150-07  | WDX16 -C25-3D-48L    | 16   | 128 | 48   | 72  | 56 | 25 |      | 0.40      |            |        |                 |
| 68150-08  | WDX16.5-C25-3D-49.5L | 16.5 | 128 | 49.5 | 72  | 56 | 25 |      | 0.35      |            |        |                 |
| 68150-09  | WDX17 -C25-3D-51L    | 17   | 131 | 51   | 75  | 56 | 25 |      | 0.30      |            |        |                 |
| 68150-10  | WDX17.5-C25-3D-52.5L | 17.5 | 131 | 52.5 | 75  | 56 | 25 |      | 0.25      |            |        |                 |
| 68150-11  | WDX18 -C25-3D-54L    | 18   | 134 | 54   | 78  | 56 | 25 | 32   | 0.20      | WDXT063006 | T7     | M2.2-5.5-3.4-60 |
| 68150-12  | WDX18.5-C25-3D-55.5L | 18.5 | 134 | 55.5 | 78  | 56 | 25 |      | 0.50      |            |        |                 |
| 68150-13  | WDX19 -C25-3D-57L    | 19   | 137 | 57   | 81  | 56 | 25 |      | 0.45      |            |        |                 |
| 68150-14  | WDX19.5-C25-3D-58.5L | 19.5 | 137 | 58.5 | 81  | 56 | 25 |      | 0.40      |            |        |                 |
| 68150-15  | WDX20 -C25-3D-60L    | 20   | 140 | 60   | 84  | 56 | 25 |      | 0.30      |            |        |                 |
| 68150-16  | WDX20.5-C25-3D-61.5L | 20.5 | 140 | 61.5 | 84  | 56 | 25 |      | 0.30      |            |        |                 |
| 68150-17  | WDX21 -C25-3D-63L    | 21   | 143 | 63   | 87  | 56 | 25 |      | 0.20      | WDXT073506 | T8     | M2.5-6.0-3.5-60 |
| 68150-18  | WDX21.5-C25-3D-64.5L | 21.5 | 143 | 64.5 | 87  | 56 | 25 |      | 0.15      |            |        |                 |
| 68150-19  | WDX22 -C25-3D-66L    | 22   | 146 | 66   | 90  | 56 | 25 |      | 0.10      |            |        |                 |
| 68150-20  | WDX22.5-C25-3D-67.5L | 22.5 | 146 | 67.5 | 90  | 56 | 25 |      | 0.05      |            |        |                 |
| 68150-21  | WDX23 -C25-3D-69L    | 23   | 149 | 69   | 93  | 56 | 25 |      | 0.70      |            |        |                 |
| 68150-22  | WDX23.5-C32-3D-70.5L | 23.5 | 149 | 70.5 | 93  | 60 | 32 | 38.5 | 0.70      | WDXT073506 | T8     | M2.5-6.0-3.5-60 |
| 68150-23  | WDX24 -C32-3D-72L    | 24   | 156 | 72   | 96  | 60 | 32 |      | 0.60      |            |        |                 |
| 68150-24  | WDX24.5-C32-3D-73.5L | 24.5 | 156 | 73.5 | 96  | 60 | 32 |      | 0.50      |            |        |                 |
| 68150-25  | WDX25 -C32-3D-75L    | 25   | 159 | 75   | 99  | 60 | 32 |      | 0.50      |            |        |                 |
| 68150-26  | WDX25.5-C32-3D-76.5L | 25.5 | 159 | 76.5 | 99  | 60 | 32 |      | 0.45      |            |        |                 |
| 68150-27  | WDX26 -C32-3D-78L    | 26   | 167 | 78   | 107 | 60 | 32 |      | 0.40      |            |        |                 |
| 68150-28  | WDX26.5-C32-3D-79.5L | 26.5 | 167 | 79.5 | 107 | 60 | 32 |      | 0.35      |            |        |                 |
| 68150-29  | WDX27 -C32-3D-81L    | 27   | 170 | 81   | 110 | 60 | 32 |      | 0.25      |            |        |                 |
| 68150-30  | WDX27.5-C32-3D-82.5L | 27.5 | 170 | 82.5 | 110 | 60 | 32 |      | 0.20      |            |        |                 |
| 68150-31  | WDX28 -C32-3D-84L    | 28   | 173 | 84   | 113 | 60 | 32 |      | 0.15      |            |        |                 |
| 68150-32  | WDX28.5-C32-3D-85.5L | 28.5 | 173 | 85.5 | 113 | 60 | 32 |      | 0.10      |            |        |                 |



CUTTING TOOL

**68150****WDX-3D****Rapid Drill (3D)**

Unit:mm

| Order No. | Model                | D    | L   | J    | J1  | J2 | d  | d1   | Deviation | Inserts   | Wrench | Screw            |
|-----------|----------------------|------|-----|------|-----|----|----|------|-----------|-----------|--------|------------------|
| 68150-33  | WDX29 -C32-3D-87L    | 29   | 176 | 87   | 116 | 60 | 32 | 38.5 | 1.00      | WDX094008 | T15    | M3.5-8.0-5.3-60  |
| 68150-34  | WDX29.5-C32-3D-88.5L | 29.5 | 176 | 88.5 | 119 | 60 | 32 |      | 0.95      |           |        |                  |
| 68150-35  | WDX30 -C32-3D-90L    | 30   | 179 | 90   | 119 | 60 | 32 |      | 0.90      |           |        |                  |
| 68150-36  | WDX31 -C32-3D-93L    | 31   | 182 | 93   | 122 | 60 | 32 |      | 0.80      |           |        |                  |
| 68150-37  | WDX32 -C32-3D-96L    | 32   | 185 | 96   | 125 | 60 | 32 |      | 0.70      |           |        |                  |
| 68150-38  | WDX33 -C32-3D-99L    | 33   | 188 | 99   | 128 | 60 | 32 |      | 0.55      |           |        |                  |
| 68150-39  | WDX34 -C32-3D-102L   | 34   | 191 | 102  | 131 | 60 | 32 |      | 0.45      |           |        |                  |
| 68150-40  | WDX35 -C32-3D-105L   | 35   | 194 | 105  | 134 | 60 | 32 |      | 0.35      |           |        |                  |
| 68150-41  | WDX36 -C32-3D-108L   | 36   | 197 | 108  | 137 | 60 | 32 | 48   | 0.20      | WDX125012 | T20    | M5.0-11.0-7.0-60 |
| 68150-42  | WDX37 -C32-3D-111L   | 37   | 200 | 111  | 140 | 60 | 32 |      | 1.00      |           |        |                  |
| 68150-43  | WDX38 -C32-3D-114L   | 38   | 203 | 114  | 143 | 60 | 32 |      | 1.00      |           |        |                  |
| 68150-44  | WDX39 -C32-3D-117L   | 39   | 206 | 117  | 146 | 60 | 32 |      | 0.90      |           |        |                  |
| 68150-45  | WDX40 -C40-3D-120L   | 40   | 219 | 120  | 149 | 70 | 40 |      | 0.80      |           |        |                  |
| 68150-46  | WDX41 -C40-3D-123L   | 41   | 222 | 123  | 152 | 70 | 40 |      | 0.70      |           |        |                  |
| 68150-47  | WDX42 -C40-3D-126L   | 42   | 225 | 126  | 155 | 70 | 40 |      | 0.60      |           |        |                  |
| 68150-48  | WDX43 -C40-3D-129L   | 43   | 228 | 129  | 158 | 70 | 40 |      | 0.50      |           |        |                  |
| 68150-49  | WDX44 -C40-3D-132L   | 44   | 231 | 132  | 161 | 70 | 40 | 54   | 0.50      | WDX156012 | T25    | M6.0-15.0-9.0-60 |
| 68150-50  | WDX45 -C40-3D-135L   | 45   | 234 | 135  | 164 | 70 | 40 |      | 0.40      |           |        |                  |
| 68150-51  | WDX46 -C40-3D-138L   | 46   | 243 | 138  | 173 | 70 | 40 |      | 1.50      |           |        |                  |
| 68150-52  | WDX47 -C40-3D-141L   | 47   | 246 | 141  | 176 | 70 | 40 |      | 1.40      |           |        |                  |
| 68150-53  | WDX48 -C40-3D-144L   | 48   | 249 | 144  | 179 | 70 | 40 |      | 1.30      |           |        |                  |
| 68150-54  | WDX49 -C40-3D-147L   | 49   | 252 | 147  | 182 | 70 | 40 |      | 1.20      |           |        |                  |
| 68150-55  | WDX50 -C40-3D-150L   | 50   | 255 | 150  | 185 | 70 | 40 |      | 1.10      |           |        |                  |
| 68150-56  | WDX51 -C40-3D-153L   | 51   | 258 | 153  | 188 | 70 | 40 |      | 1.00      |           |        |                  |
| 68150-57  | WDX52 -C40-3D-156L   | 52   | 261 | 156  | 191 | 70 | 40 | 55   | 0.90      | WDX186012 | T25    | M6.0-15.0-9.0-60 |
| 68150-58  | WDX53 -C40-3D-159L   | 53   | 264 | 159  | 194 | 70 | 40 |      | 0.80      |           |        |                  |
| 68150-59  | WDX54 -C40-3D-162L   | 54   | 267 | 162  | 197 | 70 | 40 |      | 0.60      |           |        |                  |
| 68150-60  | WDX55 -C40-3D-165L   | 55   | 270 | 165  | 200 | 70 | 40 |      | 0.50      |           |        |                  |
| 68150-61  | WDX56 -C40-3D-168L   | 56   | 276 | 168  | 206 | 70 | 40 |      | 2.00      |           |        |                  |
| 68150-62  | WDX57 -C40-3D-171L   | 57   | 279 | 171  | 209 | 70 | 40 |      | 1.80      |           |        |                  |
| 68150-63  | WDX58 -C40-3D-174L   | 58   | 282 | 174  | 212 | 70 | 40 |      | 1.70      |           |        |                  |
| 68150-64  | WDX59 -C40-3D-177L   | 59   | 285 | 177  | 215 | 70 | 40 |      | 1.60      |           |        |                  |
| 68150-65  | WDX60 -C40-3D-180L   | 60   | 288 | 180  | 218 | 70 | 40 | 58   | 1.50      | WDX042004 | T6     | M1.8-3.0-2.4-60  |
| 68150-66  | WDX61 -C40-3D-183L   | 61   | 291 | 183  | 221 | 70 | 40 | 59   | 1.40      |           |        |                  |
| 68150-67  | WDX62 -C40-3D-186L   | 62   | 294 | 186  | 224 | 70 | 40 | 60   | 1.30      |           |        |                  |
| 68150-68  | WDX63 -C40-3D-189L   | 63   | 297 | 189  | 227 | 70 | 40 | 61   | 1.20      |           |        |                  |
| 68150-69  | WDX64 -C40-3D-192L   | 64   | 300 | 192  | 230 | 70 | 40 | 62   | 1.00      |           |        |                  |
| 68150-70  | WDX65 -C40-3D-195L   | 65   | 303 | 195  | 233 | 70 | 40 | 63   | 0.90      |           |        |                  |
| 68150-71  | WDX66 -C40-3D-198L   | 66   | 306 | 198  | 236 | 70 | 40 | 64   | 0.70      |           |        |                  |
| 68150-72  | WDX67 -C40-3D-201L   | 67   | 309 | 201  | 239 | 70 | 40 | 65   | 0.60      |           |        |                  |
| 68150-73  | WDX68 -C40-3D-204L   | 68   | 312 | 204  | 242 | 70 | 40 | 65   | 0.50      | WDX073506 | T8     | M2.5-6.0-3.5-60  |
| 68150-74  | WDX14.5-C25-3D-43.5L | 14.5 | 122 | 43.5 | 66  | 56 | 25 | 32   | 0.20      |           |        |                  |
| 68150-75  | WDX24.5-C32-3D-73.5L | 24.5 | 156 | 73.5 | 96  | 60 | 32 | 38.5 | 0.50      |           |        |                  |



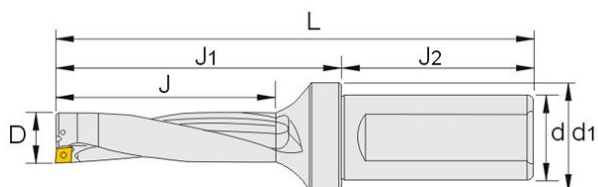
CUTTING TOOL

# Cutting Tool

**68160**

**WDX-4D**

**Rapid Drill (4D)**



90° Unit:mm

| Order No. | Model               | D    | L   | J   | J1  | J2 | d  | d1   | Deviation | Inserts    | Wrench | Screw           |
|-----------|---------------------|------|-----|-----|-----|----|----|------|-----------|------------|--------|-----------------|
| 68160-01  | WDX13 -C25-4D-52L   | 13   | 132 | 52  | 76  | 56 | 25 | 32   | 0.35      | WDXTO42004 | T6     | M1.6-2.7-2.4-60 |
| 68160-02  | WDX13.5-C25-4D-56L  | 13.5 | 132 | 54  | 76  | 56 | 25 |      | 0.30      |            |        |                 |
| 68160-03  | WDX14 -C25-4D-56L   | 14   | 136 | 56  | 80  | 56 | 25 |      | 0.25      |            |        |                 |
| 68160-04  | WDX14.5-C25-4D-60L  | 14.5 | 136 | 58  | 80  | 56 | 25 |      | 0.20      |            |        |                 |
| 68160-05  | WDX15 -C25-4D-60L   | 15   | 140 | 60  | 84  | 56 | 25 |      | 0.15      |            |        |                 |
| 68160-06  | WDX15.5-C25-4D-64L  | 15.5 | 140 | 62  | 84  | 56 | 25 |      | 0.40      | WDXTO52504 | T6     | M2.0-5.0-2.7-60 |
| 68160-07  | WDX16 -C25-4D-64L   | 16   | 144 | 64  | 88  | 56 | 25 |      | 0.40      |            |        |                 |
| 68160-08  | WDX16.5-C25-4D-68L  | 16.5 | 144 | 66  | 88  | 56 | 25 |      | 0.35      |            |        |                 |
| 68160-09  | WDX17 -C25-4D-68L   | 17   | 148 | 68  | 92  | 56 | 25 |      | 0.30      |            |        |                 |
| 68160-10  | WDX17.5-C25-4D-72L  | 17.5 | 148 | 70  | 92  | 56 | 25 |      | 0.25      |            |        |                 |
| 68160-11  | WDX18 -C25-4D-72L   | 18   | 152 | 72  | 96  | 56 | 25 | 32   | 0.20      | WDXTO63006 | T7     | M2.2-5.5-3.4-60 |
| 68160-12  | WDX18.5-C25-4D-76L  | 18.5 | 152 | 74  | 96  | 56 | 25 |      | 0.50      |            |        |                 |
| 68160-13  | WDX19 -C25-4D-76L   | 19   | 156 | 76  | 100 | 56 | 25 |      | 0.45      |            |        |                 |
| 68160-14  | WDX19.5-C25-4D-80L  | 19.5 | 156 | 78  | 100 | 56 | 25 |      | 0.40      |            |        |                 |
| 68160-15  | WDX20 -C25-4D-80L   | 20   | 160 | 80  | 104 | 56 | 25 |      | 0.30      |            |        |                 |
| 68160-16  | WDX20.5-C25-4D-84L  | 20.5 | 160 | 82  | 104 | 56 | 25 |      | 0.30      |            |        |                 |
| 68160-17  | WDX21 -C25-4D-84L   | 21   | 164 | 84  | 108 | 56 | 25 |      | 0.20      |            |        |                 |
| 68160-18  | WDX21.5-C25-4D-88L  | 21.5 | 164 | 86  | 108 | 56 | 25 |      | 0.15      | WDXTO73506 | T8     | M2.5-6.0-3.5-60 |
| 68160-19  | WDX22 -C25-4D-88L   | 22   | 168 | 88  | 112 | 56 | 25 |      | 0.10      |            |        |                 |
| 68160-20  | WDX22.5-C25-4D-92L  | 22.5 | 168 | 90  | 112 | 56 | 25 |      | 0.05      |            |        |                 |
| 68160-21  | WDX23 -C25-4D-92L   | 23   | 172 | 92  | 116 | 56 | 25 |      | 0.70      |            |        |                 |
| 68160-22  | WDX23.5-C32-4D-96L  | 23.5 | 176 | 94  | 116 | 60 | 32 | 38.5 | 0.70      |            |        |                 |
| 68160-23  | WDX24 -C32-4D-96L   | 24   | 180 | 96  | 120 | 60 | 32 |      | 0.60      |            |        |                 |
| 68160-24  | WDX24.5-C32-4D-100L | 24.5 | 180 | 98  | 120 | 60 | 32 |      | 0.50      |            |        |                 |
| 68160-25  | WDX25 -C32-4D-100L  | 25   | 184 | 100 | 124 | 60 | 32 |      | 0.50      |            |        |                 |
| 68160-26  | WDX25.5-C32-4D-104L | 25.5 | 184 | 102 | 124 | 60 | 32 |      | 0.45      |            |        |                 |
| 68160-27  | WDX26 -C32-4D-104L  | 26   | 193 | 104 | 133 | 60 | 32 |      | 0.40      |            |        |                 |
| 68160-28  | WDX26.5-C32-4D-108L | 26.5 | 193 | 106 | 133 | 60 | 32 |      | 0.35      |            |        |                 |
| 68160-29  | WDX27 -C32-4D-108L  | 27   | 197 | 108 | 137 | 60 | 32 |      | 0.25      |            |        |                 |
| 68160-30  | WDX27.5-C32-4D-112L | 27.5 | 197 | 110 | 137 | 60 | 32 |      | 0.20      |            |        |                 |
| 68160-31  | WDX28 -C32-4D-112L  | 28   | 201 | 112 | 141 | 60 | 32 |      | 0.15      |            |        |                 |
| 68160-32  | WDX28.5-C32-4D-116L | 28.5 | 201 | 114 | 141 | 60 | 32 |      | 0.10      |            |        |                 |



CUTTING TOOL

Unit:mm

| Order No. | Model               | D    | L   | J   | J1  | J2 | d  | d1   | Deviation | Inserts   | Wrench | Screw            |
|-----------|---------------------|------|-----|-----|-----|----|----|------|-----------|-----------|--------|------------------|
| 68160-33  | WDX29 -C32-4D-116L  | 29   | 205 | 116 | 145 | 60 | 32 | 38.5 | 1.00      | WDX094008 | T15    | M3.5-8.0-5.3-60  |
| 68160-34  | WDX29.5-C32-4D-120L | 29.5 | 205 | 118 | 149 | 60 | 32 |      | 0.95      |           |        |                  |
| 68160-35  | WDX30 -C32-4D-120L  | 30   | 209 | 120 | 149 | 60 | 32 |      | 0.90      |           |        |                  |
| 68160-36  | WDX31 -C32-4D-124L  | 31   | 213 | 124 | 153 | 60 | 32 |      | 0.80      |           |        |                  |
| 68160-37  | WDX32 -C32-4D-128L  | 32   | 217 | 128 | 157 | 60 | 32 |      | 0.70      |           |        |                  |
| 68160-38  | WDX33 -C32-4D-132L  | 33   | 221 | 132 | 161 | 60 | 32 |      | 0.55      |           |        |                  |
| 68160-39  | WDX34 -C32-4D-136L  | 34   | 225 | 136 | 165 | 60 | 32 |      | 0.45      |           |        |                  |
| 68160-40  | WDX35 -C32-4D-140L  | 35   | 229 | 140 | 169 | 60 | 32 |      | 0.35      |           |        |                  |
| 68160-41  | WDX36 -C32-4D-144L  | 36   | 233 | 144 | 173 | 60 | 32 | 48   | 0.20      | WDX125012 | T20    | M5.0-11.0-7.0-60 |
| 68160-42  | WDX37 -C32-4D-148L  | 37   | 237 | 148 | 177 | 60 | 32 |      | 1.00      |           |        |                  |
| 68160-43  | WDX38 -C32-4D-152L  | 38   | 241 | 152 | 181 | 60 | 32 |      | 1.00      |           |        |                  |
| 68160-44  | WDX39 -C32-4D-156L  | 39   | 245 | 156 | 185 | 60 | 32 |      | 0.90      |           |        |                  |
| 68160-45  | WDX40 -C40-4D-160L  | 40   | 259 | 160 | 189 | 70 | 40 |      | 0.80      |           |        |                  |
| 68160-46  | WDX41 -C40-4D-164L  | 41   | 263 | 164 | 193 | 70 | 40 |      | 0.70      |           |        |                  |
| 68160-47  | WDX42 -C40-4D-168L  | 42   | 267 | 168 | 197 | 70 | 40 |      | 0.60      |           |        |                  |
| 68160-48  | WDX43 -C40-4D-172L  | 43   | 271 | 172 | 201 | 70 | 40 |      | 0.50      |           |        |                  |
| 68160-49  | WDX44 -C40-4D-176L  | 44   | 275 | 176 | 205 | 70 | 40 | 54   | 0.50      | WDX156012 | T25    | M6.0-15.0-9.0-60 |
| 68160-50  | WDX45 -C40-4D-180L  | 45   | 279 | 180 | 209 | 70 | 40 |      | 0.40      |           |        |                  |
| 68160-51  | WDX46 -C40-4D-184L  | 46   | 289 | 184 | 219 | 70 | 40 |      | 1.50      |           |        |                  |
| 68160-52  | WDX47 -C40-4D-188L  | 47   | 293 | 188 | 223 | 70 | 40 |      | 1.40      |           |        |                  |
| 68160-53  | WDX48 -C40-4D-192L  | 48   | 297 | 192 | 227 | 70 | 40 |      | 1.30      |           |        |                  |
| 68160-54  | WDX49 -C40-4D-196L  | 49   | 301 | 196 | 231 | 70 | 40 |      | 1.20      |           |        |                  |
| 68160-55  | WDX50 -C40-4D-200L  | 50   | 305 | 200 | 235 | 70 | 40 |      | 1.10      |           |        |                  |
| 68160-56  | WDX51 -C40-4D-204L  | 51   | 309 | 204 | 239 | 70 | 40 |      | 1.00      |           |        |                  |
| 68160-57  | WDX52 -C40-4D-208L  | 52   | 313 | 208 | 243 | 70 | 40 | 55   | 0.90      | WDX186012 | T25    | M6.0-15.0-9.0-60 |
| 68160-58  | WDX53 -C40-4D-212L  | 53   | 317 | 212 | 247 | 70 | 40 |      | 0.80      |           |        |                  |
| 68160-59  | WDX54 -C40-4D-216L  | 54   | 321 | 216 | 251 | 70 | 40 |      | 0.60      |           |        |                  |
| 68160-60  | WDX55 -C40-4D-220L  | 55   | 325 | 220 | 255 | 70 | 40 |      | 0.50      |           |        |                  |
| 68160-61  | WDX56 -C40-4D-224L  | 56   | 332 | 224 | 262 | 70 | 40 |      | 2.00      |           |        |                  |
| 68160-62  | WDX57 -C40-4D-228L  | 57   | 336 | 228 | 266 | 70 | 40 |      | 1.80      |           |        |                  |
| 68160-63  | WDX58 -C40-4D-232L  | 58   | 340 | 232 | 270 | 70 | 40 |      | 1.70      |           |        |                  |
| 68160-64  | WDX59 -C40-4D-236L  | 59   | 344 | 236 | 274 | 70 | 40 |      | 1.60      |           |        |                  |
| 68160-65  | WDX60 -C40-4D-240L  | 60   | 348 | 240 | 278 | 70 | 40 | 58   | 1.50      |           |        |                  |
| 68160-66  | WDX61 -C40-4D-244L  | 61   | 352 | 244 | 282 | 70 | 40 | 59   | 1.40      |           |        |                  |
| 68160-67  | WDX62 -C40-4D-248L  | 62   | 356 | 248 | 288 | 70 | 40 | 60   | 1.30      |           |        |                  |
| 68160-68  | WDX63 -C40-4D-252L  | 63   | 360 | 252 | 290 | 70 | 40 | 61   | 1.20      |           |        |                  |
| 68160-69  | WDX64 -C40-4D-256L  | 64   | 364 | 256 | 294 | 70 | 40 | 62   | 1.00      |           |        |                  |
| 68160-70  | WDX65 -C40-4D-260L  | 65   | 368 | 260 | 298 | 70 | 40 | 63   | 0.90      |           |        |                  |
| 68160-71  | WDX66 -C40-4D-264L  | 66   | 372 | 264 | 302 | 70 | 40 | 64   | 0.70      |           |        |                  |
| 68160-72  | WDX67 -C40-4D-268L  | 67   | 376 | 268 | 306 | 70 | 40 | 65   | 0.60      |           |        |                  |
| 68160-73  | WDX68 -C40-4D-272L  | 68   | 380 | 272 | 310 | 70 | 40 | 66   | 0.50      |           |        |                  |



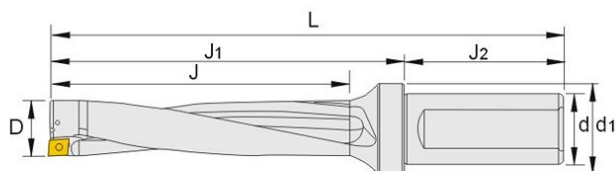
CUTTING TOOL

# Cutting Tool

**68170**

**WDX-5D**

**Rapid Drill (5D)**



90° Unit:mm

| Order No. | Model               | D    | L   | J     | J1  | J2 | d  | d1   | Deviation | Inserts   | Wrench | Screw           |
|-----------|---------------------|------|-----|-------|-----|----|----|------|-----------|-----------|--------|-----------------|
| 68170-01  | WDX17 -C25-5D-85L   | 17   | 159 | 85    | 109 | 56 | 25 | 32   | 0.30      | WDX052504 | T6     | M2.0-5.0-2.7-60 |
| 68170-02  | WDX17.5-C25-5D-90L  | 17.5 | 159 | 87.5  | 109 | 56 | 25 |      | 0.25      |           |        |                 |
| 68170-03  | WDX18 -C25-5D-90L   | 18   | 164 | 90    | 114 | 56 | 25 |      | 0.20      |           |        |                 |
| 68170-04  | WDX18.5-C25-5D-95L  | 18.5 | 170 | 92.5  | 114 | 56 | 25 |      | 0.50      |           |        |                 |
| 68170-05  | WDX19 -C25-5D-95L   | 19   | 175 | 95    | 119 | 56 | 25 |      | 0.45      |           |        |                 |
| 68170-06  | WDX19.5-C25-5D-100L | 19.5 | 175 | 97.5  | 119 | 56 | 25 |      | 0.40      | WDX063006 | T7     | M2.2-5.5-3.4-60 |
| 68170-07  | WDX20 -C25-5D-100L  | 20   | 180 | 100   | 124 | 56 | 25 |      | 0.30      |           |        |                 |
| 68170-08  | WDX20.5-C25-5D-105L | 20.5 | 180 | 102.5 | 124 | 56 | 25 |      | 0.30      |           |        |                 |
| 68170-09  | WDX21 -C25-5D-105L  | 21   | 185 | 105   | 129 | 56 | 25 |      | 0.20      |           |        |                 |
| 68170-10  | WDX21.5-C25-5D-110L | 21.5 | 185 | 107.5 | 129 | 56 | 25 |      | 0.15      |           |        |                 |
| 68170-11  | WDX22 -C25-5D-110L  | 22   | 190 | 110   | 134 | 56 | 25 |      | 0.10      |           |        |                 |
| 68170-12  | WDX22.5-C25-5D-115L | 22.5 | 190 | 112.5 | 134 | 56 | 25 |      | 0.05      |           |        |                 |
| 68170-13  | WDX23 -C25-5D-115L  | 23   | 195 | 115   | 139 | 56 | 25 | 38.5 | 0.70      | WDX073506 | T8     | M2.5-6.0-3.5-60 |
| 68170-14  | WDX23.5-C32-5D-120L | 23.5 | 195 | 117.5 | 135 | 60 | 32 |      | 0.70      |           |        |                 |
| 68170-15  | WDX24 -C32-5D-120L  | 24   | 204 | 120   | 144 | 60 | 32 |      | 0.60      |           |        |                 |
| 68170-16  | WDX24.5-C32-5D-125L | 24.5 | 204 | 122.5 | 144 | 60 | 32 |      | 0.50      |           |        |                 |
| 68170-17  | WDX25 -C32-5D-125L  | 25   | 209 | 125   | 149 | 60 | 32 |      | 0.50      |           |        |                 |
| 68170-18  | WDX25.5-C32-5D-130L | 25.5 | 209 | 127.5 | 149 | 60 | 32 |      | 0.45      |           |        |                 |
| 68170-19  | WDX26 -C32-5D-130L  | 26   | 219 | 130   | 159 | 60 | 32 |      | 0.40      |           |        |                 |
| 68170-20  | WDX26.5-C32-5D-135L | 26.5 | 219 | 132.5 | 159 | 60 | 32 |      | 0.35      |           |        |                 |
| 68170-21  | WDX27 -C32-5D-135L  | 27   | 224 | 135   | 164 | 60 | 32 |      | 0.25      |           |        |                 |
| 68170-22  | WDX27.5-C32-5D-140L | 27.5 | 224 | 137.5 | 164 | 60 | 32 |      | 0.20      |           |        |                 |
| 68170-23  | WDX28 -C32-5D-140L  | 28   | 229 | 140   | 169 | 60 | 32 |      | 0.15      | WDX094008 | T15    | M3.5-8.0-5.3-60 |
| 68170-24  | WDX28.5-C32-5D-145L | 28.5 | 229 | 142.5 | 169 | 60 | 32 |      | 0.10      |           |        |                 |
| 68170-25  | WDX29 -C32-5D-145L  | 29   | 234 | 145   | 174 | 60 | 32 |      | 1.00      |           |        |                 |
| 68170-26  | WDX29.5-C32-5D-150L | 29.5 | 234 | 147.5 | 174 | 60 | 32 |      | 0.95      |           |        |                 |
| 68170-27  | WDX30 -C32-5D-150L  | 30   | 239 | 150   | 179 | 60 | 32 |      | 0.90      |           |        |                 |
| 68170-28  | WDX31 -C32-5D-155L  | 31   | 244 | 155   | 184 | 60 | 32 |      | 0.80      |           |        |                 |
| 68170-29  | WDX32 -C32-5D-160L  | 32   | 249 | 160   | 189 | 60 | 32 |      | 0.70      |           |        |                 |
| 68170-30  | WDX33 -C32-5D-165L  | 33   | 254 | 165   | 194 | 60 | 32 |      | 0.55      |           |        |                 |
| 68170-31  | WDX34 -C32-5D-170L  | 34   | 259 | 170   | 199 | 60 | 32 |      | 0.45      |           |        |                 |
| 68170-32  | WDX35 -C32-5D-175L  | 35   | 264 | 175   | 204 | 60 | 32 |      | 0.35      |           |        |                 |
| 68170-33  | WDX36 -C32-5D-180L  | 36   | 269 | 180   | 209 | 60 | 32 |      | 0.20      |           |        |                 |



CUTTING TOOL

# 68170

## WDX-5D

## Rapid Drill (5D)

Unit:mm

| Order No. | Model              | D  | L   | J   | J1  | J2 | d  | d1   | Deviation | Inserts    | Wrench | Screw        |
|-----------|--------------------|----|-----|-----|-----|----|----|------|-----------|------------|--------|--------------|
| 68170-34  | WDX37 -C32-5D-185L | 37 | 274 | 185 | 214 | 60 | 32 | 38.5 | 1.00      | WDXT125012 | T20    | M5-11-7.0-60 |
| 68170-35  | WDX38 -C32-5D-190L | 38 | 279 | 190 | 219 | 60 | 32 |      | 1.00      |            |        |              |
| 68170-36  | WDX39 -C32-5D-195L | 39 | 284 | 195 | 224 | 60 | 32 |      | 0.90      |            |        |              |
| 68170-37  | WDX40 -C40-5D-200L | 40 | 299 | 200 | 229 | 70 | 40 | 48   | 0.80      |            |        |              |
| 68170-38  | WDX41 -C40-5D-205L | 41 | 304 | 205 | 234 | 70 | 40 |      | 0.70      |            |        |              |
| 68170-39  | WDX42 -C40-5D-210L | 42 | 309 | 210 | 239 | 70 | 40 |      | 0.60      |            |        |              |
| 68170-40  | WDX43 -C40-5D-215L | 43 | 314 | 215 | 244 | 70 | 40 |      | 0.50      |            |        |              |
| 68170-41  | WDX44 -C40-5D-220L | 44 | 319 | 220 | 249 | 70 | 40 |      | 0.50      |            |        |              |
| 68170-42  | WDX45 -C40-5D-225L | 45 | 324 | 225 | 254 | 70 | 40 |      | 0.40      |            |        |              |
| 68170-43  | WDX46 -C40-5D-230L | 46 | 335 | 230 | 265 | 70 | 40 |      | 1.50      |            |        |              |
| 68170-44  | WDX47 -C40-5D-235L | 47 | 340 | 235 | 270 | 70 | 40 |      | 1.40      |            |        |              |
| 68170-45  | WDX48 -C40-5D-240L | 48 | 345 | 240 | 275 | 70 | 40 |      | 1.30      |            |        |              |
| 68170-46  | WDX49 -C40-5D-245L | 49 | 350 | 245 | 280 | 70 | 40 |      | 1.20      | WDXT156012 | T25    | M6-15-9.0-60 |
| 68170-47  | WDX50 -C40-5D-250L | 50 | 355 | 250 | 285 | 70 | 40 | 54   | 1.10      |            |        |              |
| 68170-48  | WDX51 -C40-5D-255L | 51 | 360 | 255 | 290 | 70 | 40 |      | 1.00      |            |        |              |
| 68170-49  | WDX52 -C40-5D-260L | 52 | 365 | 260 | 295 | 70 | 40 |      | 0.90      |            |        |              |
| 68170-50  | WDX53 -C40-5D-265L | 53 | 370 | 265 | 300 | 70 | 40 |      | 0.80      |            |        |              |
| 68170-51  | WDX54 -C40-5D-270L | 54 | 375 | 270 | 305 | 70 | 40 |      | 0.60      |            |        |              |
| 68170-52  | WDX55 -C40-5D-275L | 55 | 380 | 275 | 310 | 70 | 40 |      | 0.50      |            |        |              |



CUTTING TOOL

# Cutting Tool

## WDX FAST DRILL CUTTING DATA

| Workpieces |                                                                             | HB  | HR.C | Recommend | (Vc)m/min   | (f)mm/rev      |                |                |                |
|------------|-----------------------------------------------------------------------------|-----|------|-----------|-------------|----------------|----------------|----------------|----------------|
|            |                                                                             |     |      |           |             | φ13.0~φ18.0    | φ18.5~φ29.0    | φ29.5~φ36.0    | φ37.0~φ55.0    |
| P          | SS400                                                                       | 125 | (14) | G ACP300  | 100-150-200 | 0.05-0.07-0.10 | 0.05-0.07-0.10 | 0.05-0.08-0.11 | 0.05-0.08-0.12 |
|            | S15C                                                                        | 125 | 24   | L ACP300  | 130-170-220 | 0.04-0.07-0.10 | 0.04-0.07-0.10 | 0.04-0.08-0.11 | 0.05-0.09-0.12 |
|            | S45C                                                                        | 190 | 27   | G ACP300  | 100-150-200 | 0.08-0.12-0.20 | 0.08-0.12-0.20 | 0.08-0.13-0.22 | 0.09-0.14-0.24 |
|            | S45C Temper                                                                 | 250 | 31   | G ACP300  | 80-120-160  | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
|            | S75C                                                                        | 270 |      | G ACP300  | 100-130-160 | 0.08-0.12-0.18 | 0.08-0.12-0.18 | 0.08-0.13-0.19 | 0.09-0.14-0.22 |
|            | S75C Temper                                                                 | 300 |      | G ACP300  | 70-100-140  | 0.06-0.10-0.14 | 0.06-0.10-0.14 | 0.06-0.11-0.15 | 0.07-0.12-0.17 |
|            | SCM, SNCM                                                                   | 180 |      | L ACP300  | 100-140-180 | 0.05-0.07-0.12 | 0.05-0.07-0.12 | 0.05-0.08-0.13 | 0.06-0.08-0.15 |
|            | SCM, SNCM Temper                                                            | 275 | 28   | G ACP300  | 80-120-160  | 0.06-0.10-0.14 | 0.06-0.10-0.14 | 0.06-0.11-0.15 | 0.07-0.12-0.17 |
|            | SCM, SNCM Temper                                                            | 300 | 31   | G ACP300  | 75-110-140  | 0.06-0.10-0.14 | 0.06-0.10-0.14 | 0.06-0.11-0.15 | 0.07-0.12-0.17 |
|            | SCM, SNCM Temper                                                            | 350 | 37   | G ACP300  | 60-85-110   | 0.06-0.10-0.14 | 0.06-0.10-0.14 | 0.06-0.11-0.15 | 0.07-0.12-0.17 |
|            | SKD, SKT, SKH                                                               | 200 | (14) | G ACP300  | 100-130-160 | 0.08-0.12-0.20 | 0.08-0.12-0.20 | 0.08-0.13-0.22 | 0.09-0.14-0.24 |
|            | SKD, SKT, SKH Temper                                                        | 325 | 34   | G ACP300  | 80-100-120  | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
| M          | SUS403                                                                      | 200 | (14) | G ACP300  | 100-140-180 | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
|            | SUS403                                                                      | 240 | 22   | G ACP300  | 90-120-150  | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
|            | SUS304, SUS316                                                              | 180 |      | G ACP300  | 100-140-180 | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
| K          | Casting Iron                                                                |     |      | H ACK300  | 120-160-200 | 0.09-0.18-0.27 | 0.10-0.20-0.30 | 0.11-0.22-0.32 | 0.12-0.24-0.36 |
|            | Ductile Iron                                                                |     |      | H ACK300  | 90-120-150  | 0.09-0.18-0.27 | 0.10-0.20-0.30 | 0.11-0.22-0.32 | 0.12-0.24-0.36 |
| S          | Difficult to cut materials, heatresistant alloy, super alloy, Ti alloy etc. | 200 | (14) | G ACP300  | 25-50-70    | 0.06-0.10-0.15 | 0.06-0.10-0.15 | 0.06-0.11-0.16 | 0.07-0.12-0.18 |
| N          | Aluminum                                                                    |     |      | G DL1500  | 200-260-320 | 0.06-0.11-0.17 | 0.06-0.11-0.17 | 0.06-0.12-0.18 | 0.07-0.13-0.20 |
|            | Copper alloy                                                                |     |      | G DI1500  | 180-230-280 | 0.06-0.11-0.17 | 0.06-0.11-0.17 | 0.06-0.12-0.18 | 0.07-0.13-0.20 |

1. Spindle rpm (S) =  $(1000 \times Vc) / (\pi \times O.D.)$

2. Work table feeding (F) = S x Flutes (T) x f

3. The table is referring to 3x O.D., actual cutting statics varies depending on machine conditions.

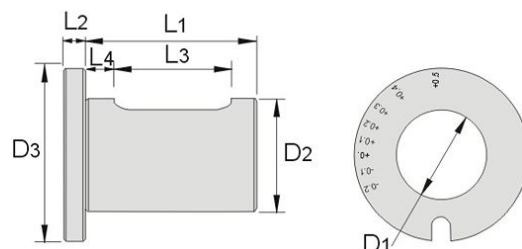
4. Decrease 15% feed for over 4x rapid drill.

5. Decrease 10% feed for non coolant through design.

**68180**

**HWAS**

**Eccentric Sleeve**

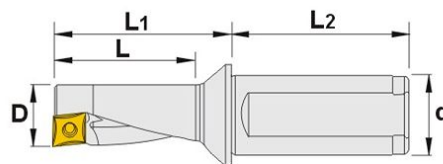


| Order No. | Model    | D1 | D2 | D3 | L1 | L2 | L3 | L4 | Wrench    |
|-----------|----------|----|----|----|----|----|----|----|-----------|
| 68180-01  | HWAS2532 | 25 | 32 | 42 | 60 | 7  | 46 | 6  | +0.5~-0.2 |
| 68180-02  | HWAS3240 | 32 | 40 | 55 | 70 | 7  | 57 | 6  | +0.5~-0.3 |

1. Graduation reading is only for reference, actual statics will depending on practical processing.

2. Apply side fix shank, normal collet or spring collet chuck are not suitable.

3. The adjustable range means dia. adjustment range.

**68190**
**HCAP**
**Turning Fast Drill**


### HCAP Turning Fast Drill-2.25D

Unit:mm

| Order No. | Model                    | D  | d  | L    | L1 | L2 | Inserts      | Wrench |
|-----------|--------------------------|----|----|------|----|----|--------------|--------|
| 68190-01  | HCAP-08R-C12-2.25D-18L   | 8  | 12 | 18   | 24 | 42 | XCM(N)T 0401 | T6     |
| 68190-02  | HCAP-10R-C12-2.25D-22.5L | 10 | 12 | 22.5 | 29 | 42 | XCM(N)T 0502 | T6     |
| 68190-03  | HCAP-12R-C16-2.25D-27L   | 12 | 16 | 27   | 35 | 45 | XCM(N)T 0602 | T7     |
| 68190-04  | HCAP-14R-C16-2.25D-31.5L | 14 | 16 | 31.5 | 40 | 45 | XCM(N)T 0703 | T8     |
| 68190-05  | HCAP-16R-C20-2.25D-36L   | 16 | 20 | 36   | 45 | 50 | XCM(N)T 0803 | T9     |
| 68190-06  | HCAP-20R-C25-2.25D-45L   | 20 | 25 | 45   | 56 | 56 | XCM(N)T 10T3 | T15    |

### HCAP Turning Fast Drill-3D

Unit:mm

| Order No. | Model               | D  | d  | L  | L1+ L2 |    | Inserts      | Wrench |
|-----------|---------------------|----|----|----|--------|----|--------------|--------|
| 68200-01  | HCAP-08R-C12-3D-24L | 8  | 12 | 24 | 30     | 42 | XCM(N)T 0401 | T6     |
| 68200-02  | HCAP-10R-C12-3D-30L | 10 | 12 | 30 | 36.5   | 42 | XCM(N)T 0502 | T6     |
| 68200-03  | HCAP-12R-C16-3D-36L | 12 | 16 | 36 | 44     | 45 | XCM(N)T 0602 | T7     |
| 68200-04  | HCAP-14R-C16-3D-42L | 14 | 16 | 42 | 50.5   | 45 | XCM(N)T 0703 | T8     |
| 68200-05  | HCAP-16R-C20-3D-48L | 16 | 20 | 48 | 57     | 50 | XCM(N)T 0803 | T9     |
| 68200-06  | HCAP-20R-C25-3D-60L | 20 | 25 | 60 | 51     | 56 | XCM(N)T 10T3 | T15    |

1. Single Drill, capable of inner and outer dia. drilling, reduce inserts replacement and more efficiency.
2. twist type for better chips removal

### HCAP Cutting Statics

Unit:mm

|   | Workpieces                  | Hardness | Drill rpm | Cutting rpm |
|---|-----------------------------|----------|-----------|-------------|
| P | Low carbon steel            | ~150     | 130~240   | 150~270     |
|   | Carbon steel                | 150~250  | 90~160    | 100~180     |
|   | Low alloy steel             | ~180     | 120~210   | 140~230     |
|   | Medium alloy steel          | 200~250  | 70~140    | 80~160      |
| M | High alloy steel            | 250~350  | 50~100    | 60~120      |
|   | Stainless steel(martensite) | 200      | 110~180   | 130~200     |
| K | Stainless steel(austenitic) | 200      | 90~160    | 100~180     |
|   | Gray cast iron              | 180~220  | 110~180   | 120~200     |
| N | Nodular cast iron           | 200~240  | 90~160    | 100~180     |
|   | Aluminum alloy              | 60~130   | 100~500   | 150~600     |
|   | Copper alloy                | 90~100   | 100~400   | 100~500     |

| Inserts    | Processing method | Flute Depth  | Flute Feed      |
|------------|-------------------|--------------|-----------------|
| XCMT040104 | Lathe cutting     | 0.6(0.2~1.8) | 0.05(0.02~0.15) |
|            | drill hole        | -            | 0.06(0.02~0.09) |
| XCMT050204 | Lathe cutting     | 0.8(0.2~2.2) | 0.08(0.03~0.18) |
|            | drill hole        | -            | 0.06(0.02~0.11) |
| XCMT060204 | Lathe cutting     | 1.0(0.3~2.5) | 0.08(0.03~0.20) |
|            | drill hole        | -            | 0.08(0.03~0.12) |
| XCMT070304 | Lathe cutting     | 1.2(0.4~2.8) | 0.12(0.05~0.22) |
|            | drill hole        | -            | 0.08(0.03~0.13) |
| XCMT080304 | Lathe cutting     | 1.5(0.4~3.2) | 0.12(0.06~0.25) |
|            | drill hole        | -            | 0.08(0.03~0.13) |
| XCMT10T304 | Lathe cutting     | 1.8(0.5~3.5) | 0.12(0.06~0.30) |
|            | drill hole        | -            | 0.08(0.03~0.13) |



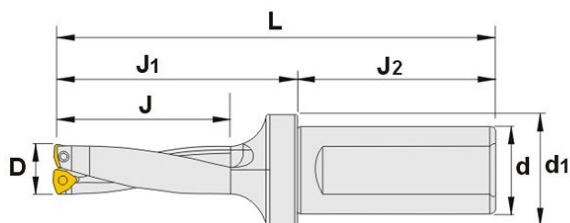
CUTTING TOOL

# Cutting Tool

**68210**

**HD-3D**

**Rapid Drill (3D)**

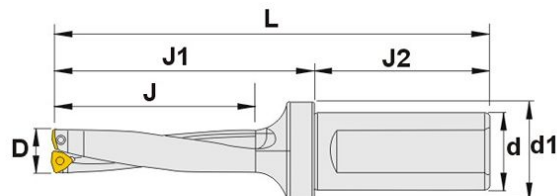


Unit:mm

| Order No. | Model            | D  | L   | J   | J1  | J2 | d  | d1   | Inserts  | Wrench | Screw           |
|-----------|------------------|----|-----|-----|-----|----|----|------|----------|--------|-----------------|
| 68210-01  | HD15-C25-3D-45L  | 15 | 118 | 45  | 62  | 56 | 25 | 32   | WC□□0302 | T8     | M2.5-6.0-3.5-60 |
| 68210-02  | HD16-C25-3D-48L  | 16 | 121 | 48  | 65  | 56 | 25 |      |          |        |                 |
| 68210-03  | HD17-C25-3D-51L  | 17 | 124 | 51  | 68  | 56 | 25 |      |          |        |                 |
| 68210-04  | HD18-C25-3D-54L  | 18 | 127 | 54  | 71  | 56 | 25 |      |          |        |                 |
| 68210-05  | HD19-C25-3D-57L  | 19 | 130 | 57  | 74  | 56 | 25 |      |          |        |                 |
| 68210-06  | HD20-C25-3D-60L  | 20 | 133 | 60  | 77  | 56 | 25 |      |          |        |                 |
| 68210-07  | HD21-C25-3D-63L  | 21 | 136 | 63  | 80  | 56 | 25 |      |          |        |                 |
| 68210-08  | HD22-C25-3D-66L  | 22 | 139 | 66  | 83  | 56 | 25 |      |          |        |                 |
| 68210-09  | HD23-C25-3D-69L  | 23 | 142 | 69  | 86  | 56 | 25 | 38.5 | WC□□0402 | T8     | M2.5-6.0-3.5-60 |
| 68210-10  | HD24-C32-3D-72L  | 24 | 146 | 72  | 86  | 60 | 32 |      |          |        |                 |
| 68210-11  | HD25-C32-3D-75L  | 25 | 150 | 75  | 90  | 60 | 32 |      |          |        |                 |
| 68210-12  | HD26-C32-3D-78L  | 26 | 154 | 78  | 94  | 60 | 32 |      |          |        |                 |
| 68210-13  | HD27-C32-3D-81L  | 27 | 158 | 81  | 98  | 60 | 32 |      |          |        |                 |
| 68210-14  | HD28-C32-3D-84L  | 28 | 162 | 84  | 102 | 60 | 32 |      |          |        |                 |
| 68210-15  | HD29-C32-3D-87L  | 29 | 166 | 87  | 106 | 60 | 32 |      |          |        |                 |
| 68210-16  | HD30-C32-3D-90L  | 30 | 170 | 90  | 110 | 60 | 32 |      |          |        |                 |
| 68210-17  | HD31-C32-3D-93L  | 31 | 174 | 93  | 114 | 60 | 32 |      |          |        |                 |
| 68210-18  | HD32-C32-3D-96L  | 32 | 178 | 96  | 118 | 60 | 32 |      |          |        |                 |
| 68210-19  | HD33-C32-3D-99L  | 33 | 182 | 99  | 122 | 60 | 32 |      |          |        |                 |
| 68210-20  | HD34-C32-3D-102L | 34 | 186 | 102 | 126 | 60 | 32 |      |          |        |                 |
| 68210-21  | HD35-C32-3D-105L | 35 | 190 | 105 | 130 | 60 | 32 |      |          |        |                 |
| 68210-22  | HD36-C32-3D-108L | 36 | 194 | 108 | 134 | 60 | 32 |      |          |        |                 |
| 68210-23  | HD37-C32-3D-111L | 37 | 198 | 111 | 138 | 60 | 32 |      |          |        |                 |
| 68210-24  | HD38-C32-3D-114L | 38 | 202 | 114 | 142 | 60 | 32 |      |          |        |                 |
| 68210-25  | HD39-C32-3D-117L | 39 | 206 | 117 | 146 | 60 | 32 |      |          |        |                 |
| 68210-26  | HD40-C40-3D-120L | 40 | 216 | 120 | 146 | 70 | 40 |      |          |        |                 |
| 68210-27  | HD41-C40-3D-123L | 41 | 220 | 123 | 150 | 70 | 40 |      |          |        |                 |



CUTTING TOOL

**68220**
**HD-4D**
**Rapid Drill (4D)**


Unit:mm

| Order No. | Model            | D  | L   | J   | J1  | J2 | d  | d1   | Inserts  | Wrench | Screw           |
|-----------|------------------|----|-----|-----|-----|----|----|------|----------|--------|-----------------|
| 68220-01  | HD15-C25-4D-60L  | 15 | 140 | 60  | 83  | 56 | 25 | 32   | WC□□0302 | T8     | M2.5-6.0-3.5-60 |
| 68220-02  | HD16-C25-4D-64L  | 16 | 144 | 64  | 87  | 56 | 25 |      |          |        |                 |
| 68220-03  | HD17-C25-4D-68L  | 17 | 148 | 68  | 91  | 56 | 25 |      |          |        |                 |
| 68220-04  | HD18-C25-4D-72L  | 18 | 152 | 72  | 95  | 56 | 25 |      |          |        |                 |
| 68220-05  | HD19-C25-4D-76L  | 19 | 156 | 76  | 99  | 56 | 25 |      |          |        |                 |
| 68220-06  | HD20-C25-4D-80L  | 20 | 160 | 80  | 103 | 56 | 25 |      |          |        |                 |
| 68220-07  | HD21-C25-4D-84L  | 21 | 164 | 84  | 107 | 56 | 25 |      |          |        |                 |
| 68220-08  | HD22-C25-4D-88L  | 22 | 168 | 88  | 111 | 56 | 25 |      |          |        |                 |
| 68220-09  | HD23-C25-4D-92L  | 23 | 172 | 92  | 115 | 56 | 25 |      |          |        |                 |
| 68220-10  | HD24-C32-4D-96L  | 24 | 185 | 96  | 119 | 60 | 32 | 38.5 | WC□□0402 | T8     | M2.5-6.0-3.5-60 |
| 68220-11  | HD25-C32-4D-100L | 25 | 189 | 100 | 123 | 60 | 32 |      |          |        |                 |
| 68220-12  | HD26-C32-4D-104L | 26 | 193 | 104 | 127 | 60 | 32 |      |          |        |                 |
| 68220-13  | HD27-C32-4D-108L | 27 | 197 | 108 | 131 | 60 | 32 |      |          |        |                 |
| 68220-14  | HD28-C32-4D-112L | 28 | 201 | 112 | 135 | 60 | 32 |      |          |        |                 |
| 68220-15  | HD29-C32-4D-116L | 29 | 205 | 116 | 139 | 60 | 32 |      |          |        |                 |
| 68220-16  | HD30-C32-4D-120L | 30 | 209 | 120 | 143 | 60 | 32 |      |          |        |                 |
| 68220-17  | HD31-C32-4D-124L | 31 | 213 | 124 | 147 | 60 | 32 |      |          |        |                 |
| 68220-18  | HD32-C32-4D-128L | 32 | 217 | 128 | 151 | 60 | 32 |      |          |        |                 |
| 68220-19  | HD33-C32-4D-132L | 33 | 221 | 132 | 155 | 60 | 32 | 48.5 | WC□□0503 | T9     | M3.5-8.0-4.4-60 |
| 68220-20  | HD34-C32-4D-136L | 34 | 225 | 136 | 159 | 60 | 32 |      |          |        |                 |
| 68220-21  | HD35-C32-4D-140L | 35 | 229 | 140 | 163 | 60 | 32 |      |          |        |                 |
| 68220-22  | HD36-C32-4D-144L | 36 | 233 | 144 | 167 | 60 | 32 |      |          |        |                 |
| 68220-23  | HD37-C32-4D-148L | 37 | 237 | 148 | 171 | 60 | 32 |      |          |        |                 |
| 68220-24  | HD38-C32-4D-152L | 38 | 241 | 152 | 175 | 60 | 32 |      |          |        |                 |
| 68220-25  | HD39-C32-4D-156L | 39 | 245 | 156 | 185 | 60 | 32 |      |          |        |                 |
| 68220-26  | HD40-C40-4D-160L | 40 | 260 | 160 | 190 | 70 | 40 |      | WC□□06T3 | T15    | M3.5-8.0-5.3-60 |
| 68220-27  | HD41-C40-4D-164L | 41 | 264 | 164 | 194 | 70 | 40 |      |          |        |                 |



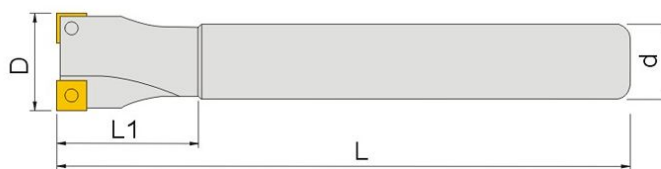
CUTTING TOOL

# Cutting Tool

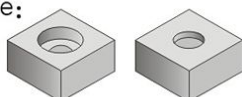
**68230**

**SRB**

**High Speed Rough Boring Cutter**



Cutting Example:



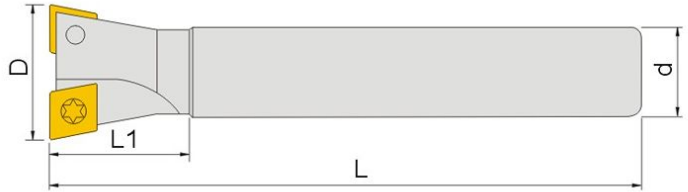
Unit:mm

| Order No.  | Model        | D    | d  | L1 | L   | T | Inserts     | Wrench | Screw |
|------------|--------------|------|----|----|-----|---|-------------|--------|-------|
| 68230-1210 | SRB 1210R-2T | 11.8 | 10 | 20 | 100 | 2 | SPMG 050204 | TS2003 | TK06  |
| 68230-1312 | SRB 1312R-2T | 12.8 | 12 | 20 | 100 |   |             |        |       |
| 68230-1412 | SRB 1412R-2T | 13.8 | 12 | 25 | 100 |   |             |        |       |
| 68230-1512 | SRB 1512R-2T | 14.8 | 12 | 25 | 100 |   |             |        |       |
| 68230-1612 | SRB 1612R-2T | 15.8 | 12 | 30 | 100 |   | SPMG 060204 | TS2205 | TK06  |
| 68230-1816 | SRB 1816R-2T | 17.7 | 16 | 30 | 130 |   |             |        |       |
| 68230-2016 | SRB 2016R-2T | 19.7 | 16 | 30 | 130 |   |             |        |       |
| 68230-2216 | SRB 2216R-2T | 21.7 | 16 | 30 | 130 |   |             |        |       |
| 68230-2420 | SRB 2420R-2T | 23.7 | 20 | 30 | 150 |   | SPMG 090408 | TS3504 | TK15  |
| 68230-2520 | SRB 2520R-2T | 24.7 | 20 | 30 | 150 |   |             |        |       |
| 68230-2620 | SRB 2620R-2T | 25.7 | 20 | 30 | 150 |   |             |        |       |
| 68230-2720 | SRB 2720R-2T | 26.7 | 20 | 30 | 150 |   |             |        |       |
| 68230-2820 | SRB 2820R-2T | 27.7 | 20 | 30 | 150 |   | SPMG 110408 | TS4006 | TK15  |
| 68230-3025 | SRB 3025R-2T | 29.7 | 25 | 40 | 200 |   |             |        |       |
| 68230-3225 | SRB 3225R-2T | 31.7 | 25 | 40 | 200 |   |             |        |       |
| 68230-3525 | SRB 3525R-2T | 34.7 | 25 | 40 | 200 |   |             |        |       |
| 68230-3625 | SRB 3625R-2T | 35.7 | 25 | 40 | 200 |   |             |        |       |
| 68230-4025 | SRB 4025R-2T | 39.7 | 25 | 40 | 200 |   |             |        |       |
| 68230-4232 | SRB 4232R-2T | 41.7 | 32 | 45 | 200 |   |             |        |       |
| 68230-4532 | SRB 4532R-2T | 44.7 | 32 | 45 | 200 |   |             |        |       |
| 68230-4832 | SRB 4832R-2T | 47.7 | 32 | 45 | 200 |   |             |        |       |
| 68230-5032 | SRB 5032R-2T | 49.7 | 32 | 45 | 200 |   |             |        |       |

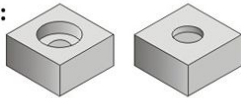


CUTTING TOOL

# 68240 FRB Rough Boring Cutter



Cutting Example:



Unit:mm

| Order No.  | Model        | D    | d  | L1 | L   | Inserts     | Wrench | Screw |
|------------|--------------|------|----|----|-----|-------------|--------|-------|
| 68240-1412 | FRB 1412R-1T | 13.8 | 12 | 25 | 100 | CCMT 060204 | TS2515 | TK08  |
| 68240-1612 | FRB 1612R-2T | 15.8 | 12 | 30 | 100 |             |        |       |
| 68240-1816 | FRB 1816R-2T | 17.7 | 16 | 30 | 120 |             |        |       |
| 68240-1916 | FRB 1916R-2T | 18.7 | 16 | 30 | 120 |             |        |       |
| 68240-2016 | FRB 2016R-2T | 19.7 | 16 | 30 | 120 |             |        |       |
| 68240-2216 | FRB 2216R-2T | 21.7 | 16 | 30 | 120 |             |        |       |
| 68240-2420 | FRB 2420R-2T | 23.7 | 20 | 30 | 130 |             |        |       |
| 68240-2520 | FRB 2520R-2T | 24.7 | 20 | 30 | 130 |             |        |       |
| 68240-2620 | FRB 2620R-2T | 25.7 | 20 | 30 | 130 | CCMT 09T304 | TS4004 | TK15  |
| 68240-2720 | FRB 2720R-2T | 26.7 | 20 | 30 | 130 |             |        |       |
| 68240-2820 | FRB 2820R-2T | 27.7 | 20 | 30 | 130 |             |        |       |
| 68240-3025 | FRB 3025R-2T | 29.7 | 25 | 40 | 160 |             |        |       |
| 68240-3225 | FRB 3225R-2T | 31.7 | 25 | 40 | 160 |             |        |       |
| 68240-3525 | FRB 3525R-2T | 34.7 | 25 | 40 | 160 |             |        |       |
| 68240-3625 | FRB 3625R-2T | 35.7 | 25 | 40 | 160 |             |        |       |
| 68240-4025 | FRB 4025R-2T | 39.7 | 25 | 40 | 160 |             |        |       |
| 68240-4232 | FRB 4232R-2T | 41.7 | 32 | 45 | 200 |             |        |       |
| 68240-4532 | FRB 4532R-2T | 44.7 | 32 | 45 | 200 |             |        |       |
| 68240-4832 | FRB 4832R-2T | 47.7 | 32 | 45 | 200 |             |        |       |
| 68240-5032 | FRB 5032R-2T | 49.7 | 32 | 45 | 200 |             |        |       |
| 68240-5232 | FRB 5232R-2T | 51.7 | 32 | 45 | 200 |             |        |       |
| 68240-5532 | FRB 5532R-2T | 54.7 | 32 | 45 | 200 |             |        |       |



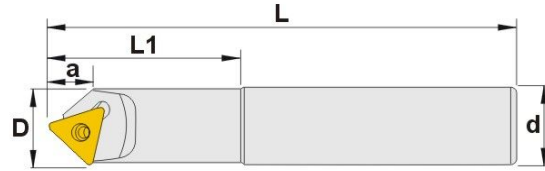
CUTTING TOOL

# Cutting Tool

**68250**

**HSP**

**Chamfering End Mill**



**45°**

Unit:mm

## HSP 45° Chamfering End Mill

| Order No. | Model          | D  | L   | L1 | d  | a    | Chamfering range | Inserts  | Wrench | Screw           |
|-----------|----------------|----|-----|----|----|------|------------------|----------|--------|-----------------|
| 68250-01  | HSP45-1212-105 | 12 | 105 | 26 | 12 | 8    | ∅0~∅6            | TC□□1003 | T8     | M2.5-6.0-3.5-60 |
| 68250-02  | HSP45-2012-100 | 20 | 100 | 22 | 12 | 11.3 | ∅0~∅20           | TC□□16T3 | T15    | M4.0-10-5.0-43  |
| 68250-03  | HSP45-2020-120 | 20 | 120 | 50 | 20 | 11.3 | ∅0~∅20           |          |        |                 |

**60°**

Unit:mm

## HSP 60° Chamfering End Mill

| Order No. | Model           | D    | L   | L1 | d  | a     | Inserts  | Wrench | Screw           |
|-----------|-----------------|------|-----|----|----|-------|----------|--------|-----------------|
| 68260-01  | HSP60-1212-105L | 13.8 | 105 | 26 | 12 | 8.5   | TC□□1003 | T8     | M2.5-6.0-3.5-60 |
| 68260-02  | HSP60-1616-110L | 19.2 | 110 | 30 | 16 | 11.16 | TC□□13T3 | T15    | M3.5-8.0-5.0-43 |
| 68260-03  | HSP60-2020-130L | 22.5 | 130 | 50 | 20 | 11.83 | TC□□16T3 |        | M4.0-10-5.0-43  |

**30°**

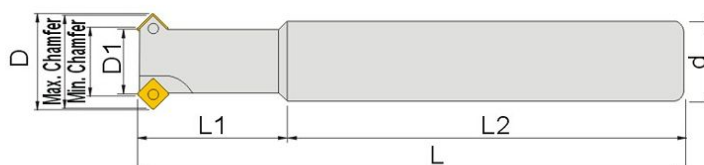
Unit:mm

## HSP 30° Chamfering End Mill

| Order No. | Model           | D    | L   | L1 | d  | a     | Inserts  | Wrench | Screw           |
|-----------|-----------------|------|-----|----|----|-------|----------|--------|-----------------|
| 68270-01  | HSP30-1212-105L | 13.8 | 105 | 26 | 12 | 8.5   | TC□□1003 | T8     | M2.5-6.0-3.5-60 |
| 68270-02  | HSP30-1616-110L | 19.2 | 110 | 30 | 16 | 11.16 | TC□□13T3 | T15    | M3.5-8.0-5.0-43 |
| 68270-03  | HSP30-2020-130L | 22.5 | 130 | 50 | 20 | 11.83 | TC□□16T3 |        | M4.0-10-5.0-43  |

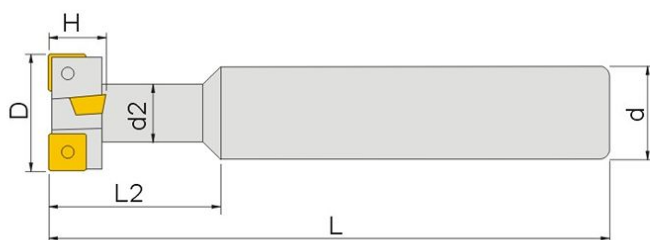


CUTTING TOOL

**68280**
**HSC45°**
**45° Inner/Outer Chamferring End Mills**


45°  
Unit:mm

| Order No. | Model           | D    | Max. Chamfer | Min. Chamfer | Min.Dia. | d  | L   | L1 | L2  | Inserts    | Wrench | Screw           |
|-----------|-----------------|------|--------------|--------------|----------|----|-----|----|-----|------------|--------|-----------------|
| 68280-01  | HSC-1510-C12-2T | 15.7 | 15           | 10           | 8.9      | 12 | 120 | 20 | 100 | SPMG050204 | T6     | M2.0-5.0-2.7-60 |
| 68280-02  | HSC-1914-C16-3T | 19.7 | 19           | 14           | 12.9     | 16 | 150 | 30 | 120 |            |        |                 |
| 68280-03  | HSC-2318-C20-4T | 23.7 | 23           | 18           | 16.9     | 20 | 150 | 35 | 115 |            |        |                 |
| 68280-04  | HSC-2921-C20-3T | 29.9 | 29           | 21           | 19.3     | 20 | 150 | 40 | 110 | SPMG07T308 | T8     | M2.5-6.0-3.5-60 |
| 68280-05  | HSC-3628-C25-3T | 36.9 | 36           | 28           | 26.3     | 25 | 150 | 40 | 110 |            |        |                 |
| 68280-06  | HSC-4335-C25-4T | 43.9 | 43           | 35           | 33.3     | 25 | 150 | 40 | 110 |            |        |                 |
| 68280-07  | HSC-5042-C25-4T | 50.9 | 50           | 42           | 40.3     | 25 | 150 | 40 | 110 |            |        |                 |

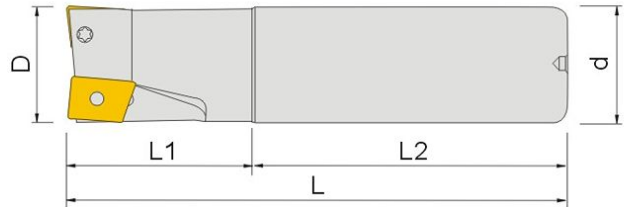
**68290**
**HST**
**T-Slot End Mill**


CUTTING TOOL

Unit:mm

| Order No. | Model            | D  | H  | d2  | L   | L2 | d  | Inserts    | Wrench | Screw           |
|-----------|------------------|----|----|-----|-----|----|----|------------|--------|-----------------|
| 68290-01  | HST-1908-100L-4T | 19 | 8  | 9.5 | 100 | 25 | 16 | SPMG050204 | T6     | M2.0-5.0-2.7-60 |
| 68290-02  | HST-2109-100L-4T | 21 | 9  | 11  | 100 | 27 | 16 | SPMG060204 | T8     | M2.2-5.5-3.4-60 |
| 68290-03  | HST-2511-100L-4T | 25 | 11 | 12  | 100 | 31 | 20 | SPMG07T308 | T8     | M2.5-6.0-3.5-60 |
| 68290-04  | HST-3214-120L-4T | 32 | 14 | 17  | 120 | 40 | 25 | SPMG090408 | T10    | M3.5-8.0-5.3-60 |
| 68290-05  | HST-4018-125L-4T | 40 | 18 | 21  | 125 | 50 | 25 | SPMG110408 | T15    | M4.0-10-5.7-60  |
| 68290-06  | HST-5022-130L-4T | 50 | 22 | 27  | 130 | 61 | 32 | SPMG140512 | T20    | M5.0-11-7.0-60  |

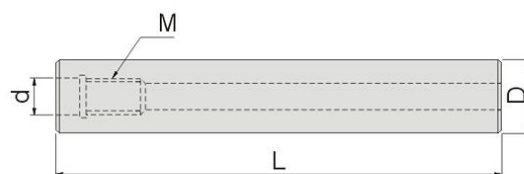
## Cutting Tool

**68300**
**TTA**
**90° Square Shoulder End Mills**


Unit:mm

| Order No. | Model           | D  | d  | L   | L1 | L2  | Flutes | Inserts                       | Wrench | Screw         |
|-----------|-----------------|----|----|-----|----|-----|--------|-------------------------------|--------|---------------|
| 68300-01  | TTA-1010S2-100L | 10 | 10 | 100 | 18 | 82  | 2      | AXMT060204<br>&<br>AXMT060208 | T6     | M1.8-3-2.4-60 |
| 68300-02  | TTA-1010S2-120L | 10 | 10 | 120 | 18 | 102 | 2      |                               |        |               |
| 68300-03  | TTA-1110S2-80L  | 11 | 10 | 80  | 18 | 62  | 2      |                               |        |               |
| 68300-04  | TTA-1110S2-120L | 11 | 10 | 120 | 18 | 102 | 2      |                               |        |               |
| 68300-05  | TTA-1212S2-80L  | 12 | 12 | 80  | 18 | 62  | 2      |                               |        |               |
| 68300-06  | TTA-1212S2-120L | 12 | 12 | 120 | 18 | 102 | 2      |                               |        |               |
| 68300-07  | TTA-1212S3-80L  | 12 | 12 | 80  | 18 | 62  | 3      |                               |        |               |
| 68300-08  | TTA-1212S3-120L | 12 | 12 | 120 | 18 | 102 | 3      |                               |        |               |
| 68300-09  | TTA-1312S3-100L | 13 | 12 | 100 | 18 | 82  | 3      |                               |        |               |
| 68300-10  | TTA-1312S3-120L | 13 | 12 | 120 | 18 | 102 | 3      |                               |        |               |
| 68300-11  | TTA-1412S3-100L | 14 | 12 | 100 | 18 | 82  | 3      |                               |        |               |
| 68300-12  | TTA-1412S3-120L | 14 | 12 | 120 | 18 | 102 | 3      |                               |        |               |
| 68300-13  | TTA-1516S3-100L | 15 | 16 | 100 | 20 | 80  | 3      |                               |        |               |
| 68300-14  | TTA-1516S3-150L | 15 | 16 | 150 | 20 | 130 | 3      |                               |        |               |
| 68300-15  | TTA-1616S3-100L | 16 | 16 | 100 | 20 | 80  | 3      |                               |        |               |
| 68300-16  | TTA-1616S3-150L | 16 | 16 | 150 | 20 | 130 | 3      |                               |        |               |
| 68300-17  | TTA-1716S3-100L | 17 | 16 | 100 | 20 | 80  | 3      |                               |        |               |
| 68300-18  | TTA-1716S3-150L | 17 | 16 | 150 | 20 | 130 | 3      |                               |        |               |
| 68300-19  | TTA-1816S4-100L | 18 | 16 | 100 | 20 | 80  | 4      |                               |        |               |
| 68300-20  | TTA-1816S4-150L | 18 | 16 | 150 | 20 | 130 | 4      |                               |        |               |
| 68300-21  | TTA-2020S4-120L | 20 | 20 | 120 | 25 | 95  | 4      |                               |        |               |
| 68300-22  | TTA-2020S4-150L | 20 | 20 | 150 | 25 | 125 | 4      |                               |        |               |
| 68300-23  | TTA-2120S4-120L | 21 | 20 | 120 | 25 | 95  | 4      |                               |        |               |
| 68300-24  | TTA-2120S4-150L | 21 | 20 | 150 | 25 | 125 | 4      |                               |        |               |
| 68300-25  | TTA-2220S4-120L | 22 | 20 | 120 | 25 | 95  | 4      |                               |        |               |
| 68300-26  | TTA-2220S4-150L | 22 | 20 | 150 | 25 | 125 | 4      |                               |        |               |
| 68300-27  | TTA-2525S5-150L | 25 | 25 | 150 | 25 | 125 | 5      |                               |        |               |

- 1.Recommended to use side lock shank.
- 2.Only use straight shank to hold the drill.
- 3.TTA End Mill has to be hold at least 1/3 of its own length.
- 4.If extension is needed, recommended use TTA-SB (68320)

**68310**
**HW**
**Tungsten Carbide Connection Rod**


Unit:mm

| Order No. | Model        | D  | d    | L   | M   |
|-----------|--------------|----|------|-----|-----|
| 68310-01  | HW10-075-M5  | 10 | 5.5  | 75  | M5  |
| 68310-02  | HW10-100-M5  | 10 | 5.5  | 100 | M5  |
| 68310-03  | HW10-150-M5  | 10 | 5.5  | 150 | M5  |
| 68310-04  | HW12-100-M6  | 12 | 6.5  | 100 | M6  |
| 68310-05  | HW12-150-M6  | 12 | 6.5  | 150 | M6  |
| 68310-06  | HW12-200-M6  | 12 | 6.5  | 200 | M6  |
| 68310-07  | HW16-100-M8  | 16 | 8.5  | 100 | M8  |
| 68310-08  | HW16-150-M8  | 16 | 8.5  | 150 | M8  |
| 68310-09  | HW16-200-M8  | 16 | 8.5  | 200 | M8  |
| 68310-10  | HW20-100-M10 | 20 | 10.5 | 100 | M10 |
| 68310-11  | HW20-150-M10 | 20 | 10.5 | 150 | M10 |
| 68310-12  | HW20-200-M10 | 20 | 10.5 | 200 | M10 |
| 68310-13  | HW20-300-M10 | 20 | 10.5 | 300 | M10 |
| 68310-14  | HW25-100-M12 | 25 | 12.5 | 100 | M12 |
| 68310-15  | HW25-150-M12 | 25 | 12.5 | 150 | M12 |
| 68310-16  | HW25-200-M12 | 25 | 12.5 | 200 | M12 |
| 68310-17  | HW25-300-M12 | 25 | 12.5 | 300 | M12 |
| 68310-18  | HW32-150-M16 | 32 | 17   | 150 | M16 |
| 68310-19  | HW32-200-M16 | 32 | 17   | 200 | M16 |
| 68310-20  | HW32-300-M16 | 32 | 17   | 300 | M16 |
| 68310-21  | HW32-400-M16 | 32 | 17   | 400 | M16 |

1.Can be used with thread type End Mills.

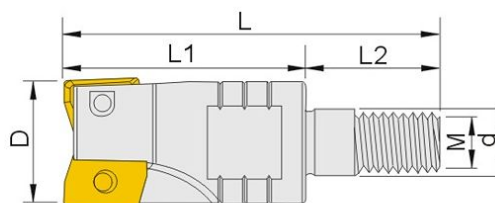


# Cutting Tool

**68320**

TTA-SB

Thread type 90° Square Shoulder End Mills



90° Unit:mm

| Order No. | Model          | D  | L    | L1   | L2 | d    | M   | Flutes | Inserts                       | Wrench | Screw         |
|-----------|----------------|----|------|------|----|------|-----|--------|-------------------------------|--------|---------------|
| 68320-01  | TTA-SB1102-M5  | 11 | 31   | 20   | 11 | 5.5  | M5  | 2      | AXMT060204<br>&<br>AXMT060208 | T6     | M1.8-3-2.4-60 |
| 68320-02  | TTA-SB1303-M6  | 13 | 34.5 | 20.5 | 14 | 6.5  | M6  | 3      |                               |        |               |
| 68320-03  | TTA-SB1703-M8  | 17 | 42.5 | 25.5 | 17 | 8.5  | M8  | 3      |                               |        |               |
| 68320-04  | TTA-SB2104-M10 | 21 | 48   | 30   | 18 | 10.5 | M10 | 4      |                               |        |               |

Material:SKD61

## TTA Cutting Statics-1

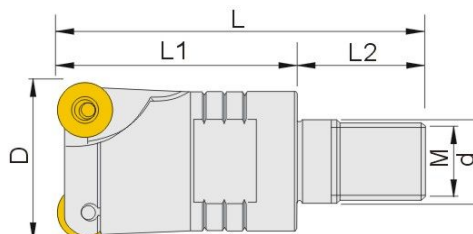
Unit:mm

|   | Workpieces                  | Hardness | Flute Depth | R.P.M   | Recommend     | Flute Feed |
|---|-----------------------------|----------|-------------|---------|---------------|------------|
| P | Low carbon steel            | 85-175   | 1.00~3.00   | 250~350 | TT9030,TT8080 | 0.04~0.10  |
|   | High carbon steel           | 175-225  | 1.00~3.00   | 150~250 | TT9030,TT8080 | 0.04~0.10  |
|   | alloy steel                 | 275-325  | 1.00~3.00   | 120~220 | TT9030,TT8080 | 0.04~0.10  |
|   | Tool steel                  | 200-250  | 1.00~3.00   | 90~130  | TT8080,TT9030 | 0.03~0.09  |
| M | Stainless steel(martensite) | -        | 1.00~3.00   | 120~220 | TT8080,TT8020 | 0.03~0.09  |
|   | Stainless steel(austenitic) | -        | 1.00~3.00   | 150~250 | TT8080,TT8020 | 0.03~0.09  |
| S | High hardness alloy         | -        | 1.00~2.00   | 25~40   | TT8080,TT8020 | 0.02~0.07  |
|   | Titanium alloy              | -        | 1.00~2.00   | 40~50   | TT9030,TT8080 | 0.02~0.07  |
| K | Cast iron                   | 190-220  | 1.00~4.00   | 250~350 | TT9030        | 0.05~0.10  |
|   | Nodular cast iron           | 140-200  | 1.00~4.00   | 140~280 | TT9030        | 0.05~0.08  |
| N | Aluminum                    | -        | 1.00~4.00   | 350~500 | K10           | 0.05~0.15  |

## TTA Cutting Statics-2

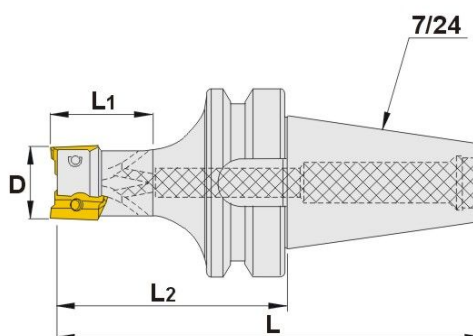
Unit:mm

| End Mill Spec. | Lateral Feed |            |             | Helix Cutting   |                 |            |
|----------------|--------------|------------|-------------|-----------------|-----------------|------------|
|                | Max. Angle   | Max. Depth | Min. Length | Min. Helix Dia. | Max. Helix Dia. | Max. Pitch |
| TTA10          | 5°           | 5          | 57          | 13              |                 | 0.7        |
|                |              |            |             |                 | 20              | 2.3        |
| TTA12          | 6°           | 5          | 48          | 17              |                 | 1.4        |
|                |              |            |             |                 | 24              | 3.4        |
| TTA16          | 4°           | 5          | 72          | 25              |                 | 1.7        |
|                |              |            |             |                 | 32              | 3          |
| TTA25          | 3°           | 5          | 95          | 33              |                 | 1.8        |
|                |              |            |             |                 | 40              | 2.8        |

**68330**
**HTR**
**Thread type End Mill**

 R  
Unit:mm

| Order No. | Model           | D  | L  | L1 | L2 | d    | M   | Flutes | Inserts  | Wrench | Screw            |
|-----------|-----------------|----|----|----|----|------|-----|--------|----------|--------|------------------|
| 68330-01  | HTR-2.5R-12-M6  | 12 | 39 | 17 | 22 | 6.5  | M6  | 2      | RD□□0501 | T6     | M2.0-3.8-2.68-43 |
| 68330-02  | HTR-3.5R-16-M8  | 16 | 41 | 18 | 23 | 8.5  | M8  | 2      |          |        |                  |
| 68330-03  | HTR-3.5R-20-M10 | 20 | 49 | 19 | 30 | 10.5 | M10 | 2      |          |        |                  |
| 68330-04  | HTR-3.5R-25-M12 | 25 | 58 | 23 | 35 | 12.5 | M12 | 3      |          |        |                  |

Material:SKD61

**68340**
**HWEX**
**Corner Rounding End Mills**


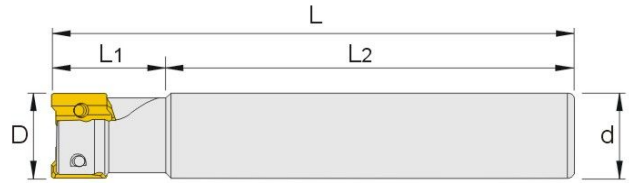
Unit:mm

| Order No. | Model                  | D  | L1 | L2 | L   | Flutes | Inserts    | Wrench | Screw           |
|-----------|------------------------|----|----|----|-----|--------|------------|--------|-----------------|
| 68340-01  | BT40-HWEX16A12-2T-C-90 | 16 | 40 | 90 | 155 | 2      | AXMT123504 | T8     | M3.0-6.0-3.8-60 |
| 68340-02  | BT40-HWEX20A12-3T-C-90 | 20 |    |    |     | 3      |            |        |                 |
| 68340-03  | BT40-HWEX25A12-4T-C-90 | 25 |    |    |     | 4      |            |        |                 |
| 68340-04  | BT40-HWEX25A17-2T-C-90 | 25 |    |    |     | 2      | AXMT170508 | T15    | M4.0-9.0-5.6-60 |
| 68340-05  | BT40-HWEX32A17-3T-C-90 | 32 |    |    |     | 3      |            |        |                 |



CUTTING TOOL

## Cutting Tool

**68350**
**HWEX**
**90° Square Shoulder End Mills**


### HWEX 90° Square Shoulder End Mills - AXMT1235 Series

90° Unit:mm

| Order No. | Model               | D  | L   | L1 | L2 | d  | Flutes | Inserts  | Wrench | Screw           |
|-----------|---------------------|----|-----|----|----|----|--------|----------|--------|-----------------|
| 68350-01  | HWEX12-1616-100L-2T | 16 | 100 | 25 | 75 | 16 | 2      | AX□T1235 | T8     | M3.0-6.0-3.8-60 |
| 68350-02  | HWEX12-1716-100L-2T | 17 | 100 | 25 | 75 | 16 | 2      |          |        |                 |
| 68350-03  | HWEX12-1816-100L-2T | 18 | 100 | 25 | 75 | 16 | 2      |          |        |                 |
| 68350-04  | HWEX12-2020-110L-3T | 20 | 110 | 30 | 80 | 20 | 3      |          |        |                 |
| 68350-05  | HWEX12-2220-110L-3T | 22 | 110 | 30 | 80 | 20 | 3      |          |        |                 |
| 68350-06  | HWEX12-2525-120L-4T | 25 | 120 | 35 | 85 | 25 | 4      |          |        |                 |

### HWEX 90° Square Shoulder End Mills - AXMT1705 Series

Unit:mm

| Order No. | Model               | D  | L   | L1 | L2  | d  | Flutes | Inserts  | Wrench | Screw           |
|-----------|---------------------|----|-----|----|-----|----|--------|----------|--------|-----------------|
| 68360-01  | HWEX17-2525-120L-2T | 25 | 120 | 35 | 85  | 25 | 2      | AX□T1705 | T15    | M4.0-9.0-5.6-60 |
| 68360-02  | HWEX17-2625-120L-2T | 26 | 120 | 35 | 85  | 25 | 2      |          |        |                 |
| 68360-03  | HWEX17-3025-130L-3T | 30 | 130 | 40 | 90  | 25 | 3      |          |        |                 |
| 68360-04  | HWEX17-3232-130L-3T | 32 | 130 | 40 | 90  | 32 | 3      |          |        |                 |
| 68360-05  | HWEX17-3532-130L-3T | 35 | 130 | 40 | 90  | 32 | 3      |          |        |                 |
| 68360-06  | HWEX17-4032-170L-4T | 40 | 170 | 50 | 120 | 32 | 4      |          |        |                 |



CUTTING TOOL

**68370**
**BAP**
**90° Square Shoulder End Mills**

**BAP 90° Square Shoulder End Mills - 1135 Series**

90° Unit:mm

| Order No. | Model            | D  | d  | L   | L1 | L2  | Flutes | Inserts  | Wrench | Screw           |
|-----------|------------------|----|----|-----|----|-----|--------|----------|--------|-----------------|
| 68370-01  | BAP-1212-100L-1T | 12 | 12 | 100 | 25 | 75  | 1      | AP□□1135 | T8     | M2.5-6.0-3.5-60 |
| 68370-02  | BAP-1516-150L-2T | 15 | 16 | 150 | 25 | 125 | 2      |          |        |                 |
| 68370-03  | BAP-1616-120L-2T | 16 | 16 | 120 | 25 | 95  | 2      |          |        |                 |
| 68370-04  | BAP-1616-160L-2T | 16 | 16 | 160 | 25 | 135 | 2      |          |        |                 |
| 68370-05  | BAP-1920-150L-2T | 19 | 20 | 150 | 30 | 120 | 2      |          |        |                 |
| 68370-06  | BAP-2020-120L-2T | 20 | 20 | 120 | 35 | 85  | 2      |          |        |                 |
| 68370-07  | BAP-2020-150L-3T | 20 | 20 | 150 | 35 | 85  | 3      |          |        |                 |
| 68370-08  | BAP-2020-150L-2T | 20 | 20 | 150 | 35 | 115 | 2      |          |        |                 |
| 68370-09  | BAP-2020-200L-2T | 20 | 20 | 200 | 35 | 165 | 2      |          |        |                 |
| 68370-10  | BAP-2525-150L-3T | 25 | 25 | 150 | 35 | 115 | 3      |          |        |                 |
| 68370-11  | BAP-2525-150L-3T | 25 | 25 | 150 | 35 | 115 | 3      |          |        |                 |

**BAP 90° Square Shoulder End Mills - 1604 Series**

90° Unit:mm

| Order No. | Model            | D  | d  | L   | L1 | L2  | Flutes | Inserts  | Wrench | Screw        |
|-----------|------------------|----|----|-----|----|-----|--------|----------|--------|--------------|
| 68380-01  | BAP-2525-150L-2T | 25 | 25 | 150 | 35 | 115 | 2      | AP□□1604 | T15    | M4-10-5.7-60 |
| 68380-02  | BAP-2525-200L-3T | 25 | 25 | 200 | 35 | 125 | 3      |          |        |              |
| 68380-03  | BAP-2525-300L-3T | 25 | 25 | 300 | 35 | 95  | 3      |          |        |              |
| 68380-04  | BAP-3232-120L-3T | 32 | 32 | 120 | 45 | 135 | 3      |          |        |              |
| 68380-05  | BAP-3232-150L-3T | 32 | 32 | 150 | 45 | 120 | 3      |          |        |              |
| 68380-06  | BAP-3232-200L-3T | 32 | 32 | 200 | 45 | 85  | 3      |          |        |              |
| 68380-07  | BAP-3232-250L-3T | 32 | 32 | 250 | 45 | 85  | 3      |          |        |              |
| 68380-08  | BAP-3232-300L-3T | 32 | 32 | 300 | 45 | 115 | 3      |          |        |              |
| 68380-09  | BAP-3532-200L-3T | 35 | 32 | 200 | 45 | 165 | 3      |          |        |              |
| 68380-10  | BAP-3532-250L-3T | 35 | 32 | 250 | 45 | 115 | 3      |          |        |              |
| 68380-11  | BAP-3532-300L-3T | 35 | 32 | 300 | 45 | 115 | 3      |          |        |              |

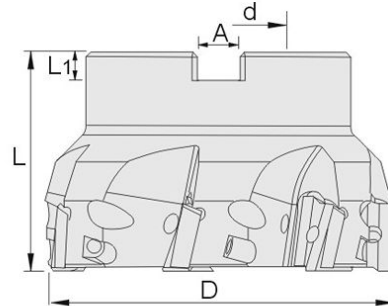


# Cutting Tool

**68390**

**HWEXF**

**90° Square Shoulder Facing End Mills**



90° Unit:mm

| Order No. | Model                 | D   | d     | L1  | L  | A    | Flutes | Inserts  | Wrench | Screw           |
|-----------|-----------------------|-----|-------|-----|----|------|--------|----------|--------|-----------------|
| 68390-01  | HWEXF-50-FMB22-5T     | 50  | 22    | 6.3 | 40 | 10.4 | 5      | AX□T1705 | T15    | M4.0-9.0-5.6-60 |
| 68390-02  | HWEXF-63-FMA25.4-6T   | 63  | 25.4  | 6.3 | 50 | 9.5  | 6      |          |        |                 |
| 68390-03  | HWEXF-80-FMA25.4-7T   | 80  | 25.4  | 6.3 | 50 | 9.5  | 7      |          |        |                 |
| 68390-04  | HWEXF-100-FMA31.75-8T | 100 | 31.75 | 7.5 | 63 | 12.7 | 8      |          |        |                 |
| 68390-05  | HWEXF-125-FMA38.1-9T  | 125 | 38.1  | 9.5 | 63 | 15.9 | 9      |          |        |                 |

## HWEX Cutting Statics 1

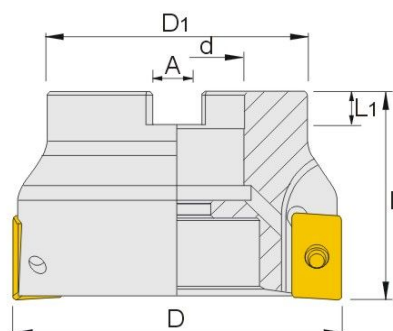
Insert  $\varnothing 20$ , AXMT1235, Depth 3mm, Width 12.5mm  $\varnothing 30$ , AXMT1705, Depth 5mm, Width 16mm

| Workpieces |                                              | Hardness<br>(HB) | Material<br>fz(mm/z) | ACP100 |      |      | ACP200 |      |      | ACP300 |      |      | ACP100 |      |      | ACP200 |      |      | ACP300 |      |      |
|------------|----------------------------------------------|------------------|----------------------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|
|            |                                              |                  |                      | 0.08   | 0.15 | 0.20 | 0.08   | 0.15 | 0.20 | 0.08   | 0.15 | 0.20 | 0.12   | 0.25 | 0.35 | 0.12   | 0.25 | 0.35 | 0.12   | 0.25 | 0.35 |
| P          | Low carbon steel                             | 125              | Vc<br>(m/min)        | 380    | 350  | 330  | 350    | 330  | 315  | 330    | 330  | 295  | 400    | 370  | 350  | 370    | 350  | 330  | 350    | 330  | 310  |
|            | Medium carbon steel                          | 190              |                      | 285    | 255  | 235  | 255    | 235  | 220  | 235    | 235  | 200  | 300    | 270  | 250  | 270    | 250  | 230  | 250    | 230  | 210  |
|            | Medium carbon steel                          | 250              |                      | 235    | 210  | 190  | 210    | 190  | 170  | 190    | 190  | 150  | 250    | 220  | 200  | 220    | 200  | 180  | 200    | 180  | 160  |
|            | Carbon steel                                 | 270              |                      | 190    | 165  | 143  | 171    | 152  | 133  | 152    | 152  | 115  | 200    | 170  | 150  | 180    | 160  | 140  | 160    | 140  | 120  |
|            | Carbon steel                                 | 300              |                      | 145    | 115  | 95   | 115    | 95   | 75   | 95     | 95   | 55   | 150    | 120  | 100  | 120    | 100  | 80   | 100    | 80   | 60   |
|            | Low alloy steel                              | 180              |                      | 265    | 235  | 220  | 235    | 220  | 200  | 220    | 220  | 180  | 280    | 250  | 230  | 250    | 230  | 210  | 230    | 210  | 190  |
|            | Low alloy steel                              | 275              |                      | 170    | 145  | 125  | 150    | 130  | 115  | 130    | 130  | 95   | 180    | 150  | 130  | 160    | 140  | 120  | 140    | 120  | 100  |
|            | Low alloy steel                              | 300              |                      | 150    | 125  | 105  | 135    | 115  | 95   | 115    | 115  | 75   | 160    | 130  | 110  | 140    | 120  | 100  | 120    | 100  | 80   |
|            | Low alloy steel                              | 350              |                      | 125    | 95   | 75   | 105    | 85   | 65   | 85     | 85   | 45   | 130    | 100  | 80   | 110    | 90   | 70   | 90     | 70   | 50   |
|            | High alloy steel                             | 200              |                      | 235    | 210  | 190  | 210    | 190  | 170  | 190    | 190  | 150  | 250    | 220  | 200  | 220    | 200  | 180  | 200    | 180  | 160  |
| M          | High alloy steel                             | 325              |                      | 125    | 95   | 75   | 95     | 75   | 55   | 75     | 75   | 35   | 130    | 100  | 80   | 100    | 80   | 60   | 80     | 60   | 40   |
|            | Stainless steel SUS403(martensite)           | 200              |                      | 200    | 170  | 150  | 170    | 150  | 130  | 150    | 150  | 115  | 210    | 180  | 160  | 180    | 160  | 140  | 160    | 140  | 120  |
|            | Stainless steel SUS403(martensite hardening) | 240              |                      | 170    | 140  | 125  | 140    | 125  | 105  | 125    | 125  | 85   | 180    | 150  | 130  | 150    | 130  | 110  | 130    | 110  | 90   |
|            | Stainless steel SUS304, SUS316(austenitic)   | 180              |                      | 220    | 190  | 170  | 190    | 190  | 150  | 170    | 170  | 130  | 230    | 200  | 180  | 200    | 180  | 160  | 180    | 160  | 140  |

| ISO | Workpieces                                        | Hardness<br>(HB) | Material<br>fz(mm/z) | ACK200 |      |      | ACK300 |      |      | DL1000 |      |      | ACK200 |      |      | ACK300 |      |      | DL1000 |      |      |
|-----|---------------------------------------------------|------------------|----------------------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|--------|------|------|
|     |                                                   |                  |                      | 0.08   | 0.15 | 0.20 | 0.08   | 0.15 | 0.20 | 0.05   | 0.15 | 0.20 | 0.12   | 0.25 | 0.35 | 0.12   | 0.25 | 0.35 | 0.05   | 0.15 | 0.20 |
| S   | Cast iron                                         |                  | Vc<br>(m/min)        | 285    | 255  | 235  | 255    | 235  | 220  |        |      |      | 300    | 270  | 250  | 270    | 250  | 230  |        |      |      |
|     | Nodular cast iron                                 |                  |                      | 190    | 160  | 140  | 160    | 140  | 125  |        |      |      | 200    | 170  | 150  | 170    | 150  | 130  |        |      |      |
| K   | Difficult cutting material                        | 200              |                      | 45     | 25   |      | 45     | 25   |      |        |      |      | 50     | 30   |      | 50     | 30   |      |        |      |      |
|     | Heat resistant alloy, super alloy, titanium alloy | 280              |                      | 45     | 25   |      | 45     | 25   |      |        |      |      | 50     | 30   |      | 50     | 30   |      |        |      |      |
| N   | Aluminum alloy Si < 13%                           |                  |                      |        |      |      |        |      |      | 1000   | 750  | 500  |        |      |      |        |      |      | 1000   | 750  | 500  |
|     | Aluminum alloy Si > 13%                           |                  |                      |        |      |      |        |      |      | 250    | 200  | 170  |        |      |      |        |      |      | 250    | 200  | 170  |
|     | Copper alloy                                      |                  |                      |        |      |      |        |      |      | 350    | 330  | 300  |        |      |      |        |      |      | 350    | 330  | 300  |



CUTTING TOOL

**68400**
**HFM90°**
**90° Square Shoulder Facing End Mills**


90° Unit:mm

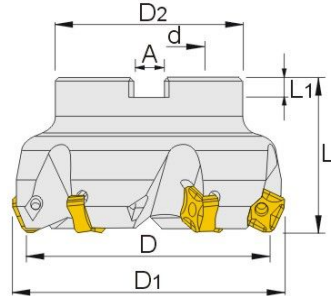
| Order No. | Model              | D   | D1 | d     | L  | L1  | A    | Flutes | Inserts  | Wrench | Screw        |
|-----------|--------------------|-----|----|-------|----|-----|------|--------|----------|--------|--------------|
| 68400-01  | HFM90-50-25.4-5T   | 50  | 48 | 25.4  | 40 | 6.3 | 10.4 | 5      | AP□□1604 | T15    | M4-10-5.7-60 |
| 68400-02  | HFM90-63-25.4-5T   | 63  | 48 | 25.4  | 40 | 6.3 | 10.4 | 5      |          |        |              |
| 68400-03  | HFM90-80-31.75-6T  | 80  | 60 | 31.75 | 50 | 7   | 12.4 | 6      |          |        |              |
| 68400-04  | HFM90-100-31.75-7T | 100 | 78 | 31.75 | 50 | 8   | 14.4 | 7      |          |        |              |
| 68400-05  | HFM90-125-38.1-8T  | 125 | 89 | 38.1  | 63 | 9   | 16.4 | 8      |          |        |              |
| 68400-06  | HFM90-50-22-5T     | 50  | 48 | 22    | 40 | 6.3 | 10.4 | 5      |          |        |              |
| 68400-07  | HFM90-63-22-5T     | 63  | 48 | 22    | 40 | 6.3 | 10.4 | 5      |          |        |              |
| 68400-08  | HFM90-80-27-6T     | 80  | 60 | 27    | 50 | 7   | 12.4 | 6      |          |        |              |
| 68400-09  | HFM90-100-32-7T    | 100 | 78 | 32    | 50 | 8   | 14.4 | 7      |          |        |              |
| 68400-10  | HFM90-125-40-8T    | 125 | 89 | 40    | 63 | 9   | 16.4 | 8      |          |        |              |

Coolant through design to reduce cutting wear.



## Cutting Tool

### 68410 HDNX25° Face Milling Cutter



25° Unit:mm

| Order No. | Model             | D   | D1  | D2  | d     | L  | L1 | A    | Flutes | Inserts  | Wrench | Screw        |
|-----------|-------------------|-----|-----|-----|-------|----|----|------|--------|----------|--------|--------------|
| 68410-01  | HDNX-080-25.4-6T  | 80  | 88  | 60  | 25.4  | 50 | 6  | 9.5  | 6      | SNMT1205 | T15    | M4-12-5.7-60 |
| 68410-02  | HDNX-100-31.75-7T | 100 | 108 | 70  | 31.75 | 50 | 8  | 12.7 | 7      |          |        |              |
| 68410-03  | HDNX-125-38.1-8T  | 125 | 133 | 80  | 38.1  | 63 | 10 | 15.9 | 8      |          |        |              |
| 68410-04  | HDNX-160-50.8-10T | 160 | 166 | 100 | 50.8  | 63 | 11 | 19   | 10     |          |        |              |

#### Features:

1. Max. depth can be 8mm, increase efficiency.
2. Double side of insert can be used, for better effective.
3. Depending on processing needs, inserts and tools can be many options.
4. Better effect on casting iron, longer life-cycle.



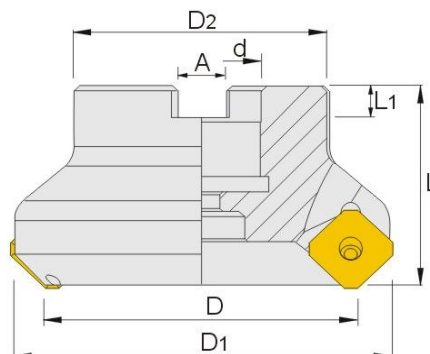
CUTTING TOOL

#### HDNX Cutting Statics.

Unit:mm

| ISO | Workpieces        | Hardness(HB) | Vc(m/min)   | Fz(mm/t)       | Recommend Material |
|-----|-------------------|--------------|-------------|----------------|--------------------|
| P   | Carbon steel      | 180~280      | 150-175-200 | 0.10-0.15-0.20 | ACP200             |
|     | Alloy steel       | 180~280      | 150-175-200 | 0.10-0.15-0.20 | ACP200             |
| K   | Cast iron         | 250          | 150-225-300 | 0.10-0.20-0.30 | ACK200,ACK300      |
|     | Nodular cast iron | 250          | 150-200-250 | 0.10-0.18-0.25 | ACK200,ACK300      |

# 68420 ASX45° 45° Face Milling Cutter



45° Unit:mm

| Order No. | Model              | D   | D1  | D2 | d     | L  | L1  | A    | Flutes | Inserts           | Wrench | Screw          |
|-----------|--------------------|-----|-----|----|-------|----|-----|------|--------|-------------------|--------|----------------|
| 68420-01  | ASX45-50-25.4-4T   | 50  | 63  | 48 | 25.4  | 40 | 6.3 | 10.4 | 4      | SE□□13T3□□<br>(日) | T15    | M3.5-10-5.5-60 |
| 68420-02  | ASX45-63-25.4-5T   | 63  | 76  | 50 | 25.4  | 40 | 6.3 | 10.4 | 5      |                   |        |                |
| 68420-03  | ASX45-80-31.75-6T  | 80  | 93  | 62 | 31.75 | 50 | 7   | 12.4 | 6      |                   |        |                |
| 68420-04  | ASX45-100-31.75-7T | 100 | 113 | 62 | 31.75 | 50 | 8   | 14.4 | 7      |                   |        |                |
| 68420-05  | ASX45-125-38.1-8T  | 125 | 138 | 89 | 38.1  | 63 | 9   | 16.4 | 8      |                   |        |                |
| 68420-06  | ASX45-50-22-4T     | 50  | 63  | 48 | 22    | 40 | 6.3 | 10.4 | 4      |                   |        |                |
| 68420-07  | ASX45-63-22-5T     | 63  | 76  | 48 | 22    | 40 | 6.3 | 10.4 | 5      |                   |        |                |
| 68420-08  | ASX45-80-27-6T     | 80  | 93  | 62 | 27    | 50 | 7   | 12.4 | 6      |                   |        |                |
| 68420-09  | ASX45-100-32-7T    | 100 | 113 | 78 | 32    | 50 | 8   | 14.4 | 7      |                   |        |                |
| 68420-10  | ASX45-125-40-8T    | 125 | 138 | 89 | 40    | 63 | 9   | 16.4 | 8      |                   |        |                |

## Features:

1. Irregular distance design, better lifecycle and efficiency.
2. Precision work after heat treatment, better hardness and accuracy.
3. Coolant through design to reduce cutting tools wear.

