

MASTER

DRILLING

INDUSTRY SOLUTIONS



MASTER DRILLING

INDUSTRY SOLUTIONS

2020

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Metal Drilling

Würth offers a full line of premium drill bits, reamers, end mills, taps and thread-repair solutions. From the hardest of steels to porous stone and concrete, we have a solution to meet your needs.

CHOOSE WÜRTH FOR ALL YOUR DRILLING NEEDS

APPLICATIONS



Stainless steel



Steel



Non-ferrous metals



Stone



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METAL DRILLING



Heavy Duty HSS Black & Bronze Oxide Drill Bits

STRAIGHT SHANK



+ Ideal for drilling truck frames and stainless steel, 135° split point eliminates "walking". Unique flute design enhances chip ejection.

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.	P. Qty	Bulk Art. No.	Bulk Qty
1/16"	0.0625	7/8"	1 7/8"	627.116	1	627.116-12	12
3/64"	0.0781	1"	2"	627.564		627.564-12	
3/32"	0.0938	1 1/4"	2 1/4"	627.332		627.332-12	
7/64"	0.1094	1 5/16"	2 3/8"	627.764		627.764-12	
1/8"	0.1250	1 7/16"	2 1/2"	627.18		627.18-12	
9/64"	0.1406	1 9/16"	2 5/8"	627.964		627.964-12	
5/32"	0.1562	1 11/16"	2 3/4"	627.532		627.532-12	
11/64"	0.1719	1 13/16"	2 7/8"	627.1164		-	

FEATURES

- 135° Split Point
- Premium Grade High Speed Steel Material
- Black and Bronze Oxide Coating/Finish
- Heavy-Duty Construction. Sizes 3/16" and larger have 3 flats on shank

TRI-SHANK



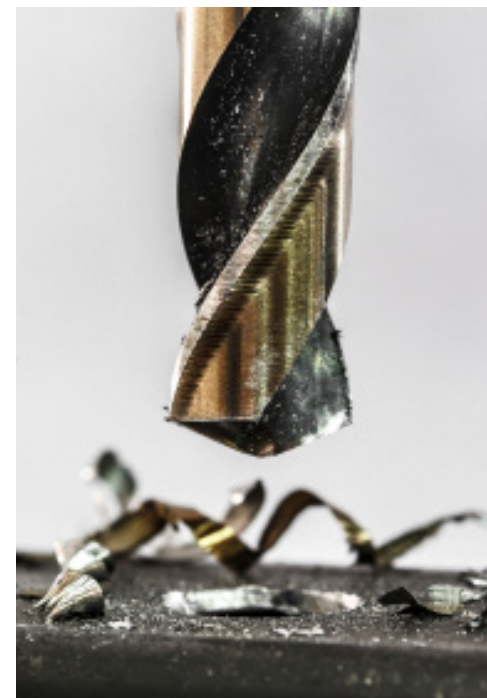
Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.	P. Qty	Bulk Art. No.	Bulk Qty
3/16"	0.1875"	1 7/8"	3"	627.316	1	627.316-12	12
13/64"	0.2031"	1 5/16"	3 1/8"	627.1364		627.1364-12	
7/32"	0.2188"	2"	3 1/4"	627.732		627.732-12	
15/64"	0.2344"	2 1/16"	3 3/8"	627.1564		627.1564-12	
1/4"	0.2500"	2"	3 1/2"	627.14		627.14-12	
17/64"	0.2656"	2 1/8"	3 5/8"	627.1764		627.1764-12	
9/32"	0.2812"	2 1/4"	3 3/4"	627.932		627.932-12	
19/64"	0.2969"	2 3/8"	3 7/8"	627.1964		627.1964-6	
5/16"	0.3125"	2 1/2"	4"	627.516	1	-	6
21/64"	0.3281"	2 9/16"	4 1/16"	627.2164		627.2164-6	
11/32"	0.3438"	2 5/8"	4 1/8"	627.1132		627.1132-6	
23/64"	0.3594"	2 11/16"	4 3/16"	627.2364		627.2364-6	
3/8"	0.3750"	2 13/16"	4 1/4"	627.38		627.38-6	
25/64"	0.3906"	2 3/4"	4 5/16"	627.2564		-	
13/32"	0.4062"	2 15/16"	4 3/8"	627.1332		627.1332-6	

Works Best on This Material	Heavy-Duty HSS Black Oxide
Aluminum/Aluminum Alloys; Bronze, Soft and Medium	
Iron, Cast Iron	✓
Steel, Low and Medium Carbon	✓
Steel, High Alloy	✓
Steel, Stainless	✓
Tough, Medium and High-Tensile Strength Alloys	✓
Wood and Plastic	

3/8" REDUCED SHANK



Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.	P. Qty	Bulk Art. No.	Bulk Qty
27/64"	0.4219"	2 7/8"	4 7/16"	627.2764	1	627.2764-6	6
7/16"	0.4375"	2 15/16"	4 1/2"	627.716		627.716-6	
29/64"	0.4531"	3"	4 5/8"	627.2964		627.2964-6	
15/32"	0.4688"	3 1/8"	4 3/4"	627.1532		627.1532-6	
31/64"	0.4844"	3 1/4"	4 7/8"	627.3164		627.3164-6	
1/2"	0.5000"	3 3/8"	5"	627.12		627.12-6	



Heavy Duty HSS Black & Bronze Oxide Drill Bits

1/2" REDUCED SHANK



FEATURES

- 118° Split Point, 1/2" Shank
- Premium Grade High Speed Steel Material
- Black and Bronze Oxide Coating

P. QTY 1

ASSORTMENT

Thunderbit Drill Index

Contains one of each : 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1"

Art. No. 627.90595 • 8 pcs.



Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
33/64"	0.5156"	3"	6"	627.3364
17/32"	0.5312"	3"	6"	627.1732
9/16"	0.5625"	3"	6"	627.916
37/64"	0.5781"	3"	6"	627.3764
19/32"	0.5938"	3"	6"	627.1932
39/64"	0.6094"	3"	6"	627.3964
5/8"	0.6250"	3"	6"	627.58
21/32"	0.6562"	3"	6"	627.2132
11/16"	0.6875"	3"	6"	627.1116
45/64"	0.7031"	3"	6"	627.4564*
23/32"	0.7188"	3"	6"	627.2332
3/4"	0.7500"	3"	6"	627.34
49/64"	0.7656"	3"	6"	627.4964
25/32"	0.7812"	3"	6"	627.2532
13/16"	0.8125"	3"	6"	627.1
27/32"	0.8438"	3"	6"	627.2732*
7/8"	0.8750"	3"	6"	627.78
29/32"	0.9062"	3"	6"	627.2932
15/16"	0.9375"	3"	6"	627.1516
1"	1.0000"	3"	6"	627.1
1 1/16"	1.0625"	3"	6"	627.11161
1 1/8"	1.1250"	3"	6"	627.118
1 3/16"	1.1875"	3"	6"	627.13161
1 1/4"	1.2500"	3"	6"	627.114
1 5/16"	1.3125"	3"	6"	627.15161
1 1/2"	1.5000"	3"	6"	627.112

* Available OnDemand

Assortments

HEAVY DUTY DRILL SET

15 assorted sizes, size range 1/16" - 1/2"

Art. No. 964.6272 • 30 pcs



HEAVY DUTY DRILL SET

20 assorted sizes, size range 1/16" - 3/8"

Art. No. 964.6274 • 40 pcs



+ Note: When working on metals (except Cast Iron) use Würth Cutting Oil, **Art. No. 893.050004**. This will provide clean cutting and long service life.



Recommended:

Cut + Cool
Cutting and Drilling Oil
Art. No. 893.050004
• 287 g



More info
on page
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WÜRTH BRINGS THE **THUNDER**



Würth Canada's
TOP SELLING
Drill Bits!

High Speed Steel Black
& Bronze Drill Bits

THUNDERBIT®

Prefix 627

Numbered Drill Bits



FEATURES

- 135° split point, High Speed Steel, black & bronze oxide
- Premium grade steel
- Heavy-duty construction
- Unique flute design for superior material removal
- Replacements for ThunderBit® Number Drill Index (1 – 60) **Art. No. 627.102**

P. QTY 1

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
1	0.2280	2 5/8"	3 7/8"	627.001
2	0.2210	2 5/8"	3 7/8"	627.002
3	0.2130	2 1/2"	3 3/4"	627.003
4	0.2090	2 1/2"	3 3/4"	627.004
5	0.2055	2 1/2"	3 3/4"	627.005*
6	0.2040	2 1/2"	3 3/4"	627.006*
7	0.2010	2 7/16"	3 5/8"	627.007
8	0.1990	2 7/16"	3 5/8"	627.008*
9	0.1960	2 7/16"	3 5/8"	627.009*
10	0.1935	2 7/16"	3 5/8"	627.010
11	0.1910	2 5/16"	3 1/2"	627.011
12	0.1890	2 5/16"	3 1/2"	627.012
13	0.1850	2 5/16"	3 1/2"	627.013*
14	0.1820	2 3/16"	3 3/8"	627.014
15	0.1800	2 3/16"	3 3/8"	627.015*
16	0.1770	2 3/16"	3 3/8"	627.016*
17	0.1730	2 3/16"	3 3/8"	627.017*
18	0.1695	2 1/8"	3 1/4"	627.018
19	0.1660	2 1/8"	3 1/4"	627.019*
20	0.1610	2 1/8"	3 1/4"	627.020*
21	0.1590	2 1/8"	3 1/4"	627.021
22	0.1570	2"	3 1/8"	627.022
23	0.1540	2"	3 1/8"	627.023*
24	0.1520	2"	3 1/8"	627.024*
25	0.1495	1 7/8"	3"	627.025
26	0.1470	1 7/8"	3"	627.026*

* Available OnDemand

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
27	0.1440	1 7/8"	3"	627.027*
28	0.1405	1 3/4"	2 7/8"	627.028*
29	0.1360	1 3/4"	2 7/8"	627.029
30	0.1285	1 5/8"	2 3/4"	627.030
31	0.1200	1 5/8"	2 3/4"	627.031*
32	0.1160	1 5/8"	2 3/4"	627.032
33	0.1130	1 1/2"	2 5/8"	627.033*
34	0.1110	1 1/2"	2 5/8"	627.034*
35	0.1100	1 1/2"	2 5/8"	627.035*
36	0.1065	1 7/16"	2 1/2"	627.036
37	0.1040	1 7/16"	2 1/2"	627.037
38	0.1015	1 7/16"	2 1/2"	627.038*
39	0.0995	1 3/8"	2 3/8"	627.039*
40	0.0980	1 3/8"	2 3/8"	627.040
41	0.0960	1 3/8"	2 3/8"	627.041*
42	0.0935	1 1/4"	2 1/4"	627.042*
43	0.0890	1 1/4"	2 1/4"	627.043
44	0.0860	1 1/8"	2 1/8"	627.044*
45	0.0820	1 1/8"	2 1/8"	627.045*

Thunderbit® Stubby Drills



+ 135° Split-Point, High Speed Steel, Black & Bronze Oxide

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
1/8"	0.1250"	7/8"	1 7/8"	627.418
3/16"	0.1875"	1 1/8"	2 3/16"	627.4316
1/4"	0.2500"	1 3/8"	2 1/2"	627.414
17/64"	0.2656"	1 7/16"	2 5/8"	627.41764*
5/16"	0.3125"	1 5/8"	2 13/16"	627.4516
3/8"	0.3750"	1 13/16"	3 1/8"	627.438

* Available OnDemand

FEATURES

- 135° split-point for quick penetration and reduced "walking"
- Premium-grade M-7 industrial steel for longer life and heat resistance
- Unique flute design for superior material removal
- Short length and heavy-duty construction provides additional strength
- Ideal for use in medium and high-tensile strength alloy materials

P. QTY 1

APPLICATION AREAS

Cast Iron; Low and Medium Carbon Steel; High Alloy Steel; Stainless Steel and PH; Tough, Medium, and High Tensile Strength Alloys; Wood



High Speed Steel Drill Bits

135° SPLIT POINT



+ HSS general purpose, straight shank. Jobber drills are the most popular drill used by engineers, tradesmen and handymen.

FEATURES

- High speed Steel Material
- Black Oxide Coating
- Heavy-Duty Construction

P. QTY |

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
5/64"	0.0781"	1"	2"	624.564
3/32"	0.0938"	1 1/4"	2 1/4"	624.332
7/64"	0.1094"	1 1/2"	2 5/8"	624.764
1/8"	0.1250"	1 5/8"	2 3/4"	624.18
9/64"	0.1406"	1 3/4"	2 7/8"	624.964
5/32"	0.1562"	2"	3 1/8"	624.532
11/64"	0.1719"	2 1/8"	3 1/4"	624.1164
3/16"	0.1875"	2 5/16"	3 1/2"	624.316
13/64"	0.2031"	2 7/16"	3 5/8"	624.1364
7/32"	0.2188"	2 1/2"	3 3/4"	624.732
15/64"	0.2344"	2 5/8"	3 7/8"	624.1564
1/4"	0.2500"	2 3/4"	4"	624.14
17/64"	0.2656"	2 7/8"	4 1/8"	624.1764
9/32"	0.2812"	2 15/16"	4 1/4"	624.932
19/64"	0.2969"	3 1/16"	4 3/8"	624.1964
5/16"	0.3125"	3 3/16"	4 1/2"	624.516
21/64"	0.3281"	3 5/16"	4 5/8"	624.2164
11/32"	0.3438"	3 7/16"	4 3/4"	624.1132
23/64"	0.3594"	3 1/2"	4 7/8"	624.2364
3/8"	0.3750"	3 5/8"	5"	624.38
25/64"	0.3906"	3 3/4"	5 1/8"	624.2564
13/32"	0.4062"	3 7/8"	5 1/4"	624.1332
27/64"	0.4219"	3 15/16"	5 3/8"	624.2764
7/16"	0.4375"	4 1/16"	5 1/2"	624.716
29/64"	0.4531"	4 3/16"	5 5/8"	624.2964
15/32"	0.4688"	4 5/16"	5 3/4"	624.1532
31/64"	0.4844"	4 3/8"	5 7/8"	624.3164
1/2"	0.5000"	4 1/2"	6"	624.12
1/16"	0.06250"	7/8"	1 7/8"	624.116

Works Best on This Material	Heavy-Duty Black Oxide
Aluminum/Aluminum Alloys; Bronze, Soft and Medium	
Iron, Cast	✓
Steel, Low and Medium Carbon	✓
Steel, High Alloy	✓
Steel, Stainless and PH	
Tough, Medium and High-Tensile Strength Alloys	✓
Wood and Plastic	

Metric HSS Drills



+ Cold-formed assembly drill for working in steel; tip angle 118°

+ **Note:** Ideal for construction sites and assembly applications

P. QTY 1

DRILL BIT ASSORTMENT - M1-10

Art. No. 634.4 • 19 pcs.



DRILL BIT ASSORTMENT - M1-13

Art. No. 634.6 • 25 pcs.



Size	Imperial Equivalent	Overall Length	Chip Flute Length	Art. No.
M1	1/32	34 mm	12 mm	625.10
M1.5	3/64	40 mm	18 mm	625.15
M2	5/64	49 mm	24 mm	625.20
M2.5	3/32	57 mm	30 mm	625.25
M3	7/64	61 mm	33 mm	625.30
M3.1	1/8	65 mm	36 mm	625.31 *
M3.2	1/8+	65 mm	36 mm	625.32
M3.5	9/64	70 mm	39 mm	625.35
M4	5/32	75 mm	43 mm	625.40
M4.2	11/64	75 mm	43 mm	625.42
M4.5	11/64+	80 mm	47 mm	625.45
M5	13/64	86 mm	52 mm	625.50
M5.5	7/32	93 mm	57 mm	625.55
M6	15/64	93 mm	57 mm	625.60
M6.3	1/4	101 mm	63 mm	625.63 *
M6.5	1/4	101 mm	63 mm	625.65
M7	17/64	109 mm	69 mm	625.70
M7.5	19/64	109 mm	69 mm	625.75
M8	5/16	117 mm	75 mm	625.80
M8.5	21/64	117 mm	75 mm	625.85
M9	11/32	125 mm	81 mm	625.90
M9.5	9/8	125 mm	81 mm	625.95
M10	25/64	133 mm	87 mm	625.100
M11	27/64	142 mm	94 mm	625.110
M12	15/32	151 mm	101 mm	625.120
M13.0	1/2	151 mm	101 mm	625.130

* Available OnDemand

Reversible Left Hand Drill Bits



+ Premium-grade industrial steel

APPLICATION

- If you use a left-hand bit to drill the hole in a broken screw or bolt so you can extract it, the odds are good that the very act of drilling will remove the broken screw without ever needing to use an extractor. Your drill must be running in reverse when you use left-hand bits.
- Left handed drills allow machining operations to continue when the spindle either cannot be reversed or where the design of the machine makes it more efficient to run left handed
- They may also be used as an aid in the removal of right-hand screws

P. QTY 1

ASSORTMENT

Left-hand Drill Bits

Art. No. 624.11100 • 29 pcs.



Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.
1/16"	0.0625"	7/8"	1 7/8"	624.11104*
5/64"	0.0781"	1"	2"	624.11105
3/32"	0.0938"	1 1/4"	2 1/4"	624.11106
7/64"	0.1094"	1 1/2"	2 3/8"	624.11107
1/8"	0.1250"	1 3/8"	2 3/4"	624.11108
9/64"	0.1406"	1 3/4"	2 7/8"	624.11109*
5/32"	0.1562"	2"	3 1/8"	624.11110
11/64"	0.1719"	2 1/8"	3 1/4"	624.11111*
3/16"	0.1875"	2 1/4"	3 1/2"	624.11112
7/32"	0.2188"	2 1/2"	3 3/4"	624.11114
15/64"	0.2344"	2 3/8"	3 7/8"	624.11115*
1/4"	0.2500"	2 3/4"	4"	624.11116
9/32"	0.2812"	2 15/16"	4 1/4"	624.11118
19/64"	0.2969"	3 1/16"	4 3/8"	624.11119*
5/16"	0.3125"	3 3/16"	4 1/2"	624.11120
21/64"	0.3281"	3 5/16"	4 5/8"	624.11121*
11/32"	0.3438"	3 7/16"	4 3/4"	624.11122*
3/8"	0.3750"	3 3/8"	5"	624.11124
13/32"	0.4062"	3 7/8"	5 1/4"	624.11126*
7/16"	0.4375"	4 1/16"	5 1/2"	624.11128*
15/32"	0.4688"	4 3/16"	5 3/4"	624.11130*
1/2"	0.5000"	4 1/2"	6"	624.11132*

* Available OnDemand



Combi Drills / Countersunk Bits



Drill Ø (D1)	Drill Length (L2)	Overall Length (L1)	Diameter Ø (D2)	Art. No.
3/64"	3/64"	1 1/4"	1/8"	649.1
5/64"	5/64"	1 7/8"	3/16"	649.2
7/64"	7/64"	2"	1/4"	649.3
1/8"	1/8"	2 1/8"	5/16"	649.4
3/16"	3/16"	2 3/4"	7/16"	649.5
7/32"	7/32"	3"	1/2"	649.6
1/4"	1/4"	3 1/4"	5/8"	649.7

FEATURES

- High speed steel
- Combined drill/countersunk
- Plain type
- 60° included countersunk angle

APPLICATION

Used for creating turning centers in bar stock so that the material can be turned or ground between centers in a lathe

P. QTY 1

Metric HSS Double-Ended Twist Drill Bit



Diameter		Art. No.
(mm)	(inches)	
3.2	1/8 +	636.32
5	3/16	636.50
6.4	1/4	636.64

Metric HSS double-Ended Twist Drill Bit

- Right-hand cutting
- Special purpose grinding facilitates penetration of the drill into the material
- No centre punch required
- Drill does not drift from the drilling location
- Ideal for machining light gauge materials
- For drilling rivet holes



Cobalt Drill Bits



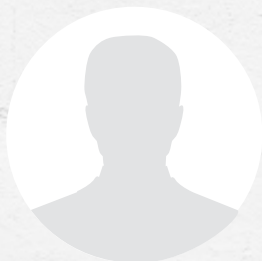
+ 135° Split-Point, Cobalt, High Speed Steel, Bronze Oxide

Size	Decimal Equivalent	Flute Length	Overall Length	Art. No.	P. Qty.
1/16"	0.0625"	7/8"	1 7/8"	626.116	1
5/64"	0.0781"	1"	2"	626.564	
3/32"	0.0938"	1 1/4"	2 1/4"	626.332	
7/64"	0.1094"	1 1/2"	2 3/4"	626.764	
1/8"	0.1250"	1 5/8"	2 3/4"	626.18	
9/64"	0.1406"	1 3/4"	2 7/8"	626.964	
5/32"	0.1562"	2"	3 1/8"	626.532	
11/64"	0.1719"	2 1/8"	3 1/4"	626.1164	
3/16"	0.1875"	2 5/16"	3 1/2"	626.316	
13/64"	0.2031"	2 7/16"	3 5/8"	626.1364	
7/32"	0.2188"	2 1/2"	3 3/4"	626.732	
15/64"	0.2344"	2 5/8"	3 7/8"	626.1564	
1/4"	0.2500"	2 3/4"	4"	626.14	
17/64"	0.2656"	2 7/8"	4 1/8"	626.1764	
9/32"	0.2812"	2 15/16"	4 1/4"	626.932	
5/16"	0.3125"	3 3/16"	4 1/2"	626.516	
21/64"	0.3281"	3 9/16"	4 5/8"	626.2164	
23/64"	0.3594"	3 1/2"	4 7/8"	626.2364	
3/8"	0.3750"	3 5/8"	5"	626.38	
27/64"	0.4219"	3 15/16"	5 3/8"	626.2764	
29/64"	0.4531"	4 3/16"	5 3/4"	626.2964	
31/64"	0.4844"	4 3/8"	5 7/8"	626.3164	

ASSORTMENT

Cobalt Drill Index 1/16 - 1/4

Art. No. 626.100 • 13 pcs.



ASK AN **EXPERT**

PRODUCT MANAGER – MATERIAL PROCESSING

Q:

WHEN IS A COBALT DRILL BIT NEEDED?

Cobalt drill bits contain anywhere from 5% to 8% cobalt with the remainder of the composition consisting of alloy steel.

EVEN IN SMALL RATIOS, COBALT CAN HAVE A LARGE IMPACT ON THE STRENGTH AND HEAT-RESISTANCE OF A DRILL BIT.

This makes cobalt drill bits ideal for drilling hard metals such as stainless steel and cast iron. The reason being is that the drill bit and the material being processed creates

friction and the excessive friction caused by a hard material can cause a drill bit to wear much sooner than it otherwise should.

Consider choosing a cobalt or carbide drill bit when working with hard materials, but also don't forget that whenever you are drilling you should consider using one of Würth's many **Cut + Cool** lubricants (893.05...) to prevent early burnout of your bits!

Ask your Würth rep for more information on our quality drilling products, or see our products online at shop.wurth.ca!

Twist Drill HSCO Bronze



Diameter (mm)	Length (mm)	Chip Flute Length (mm)	Drilling Depth (mm)	Art. No.
3	61	33	15	635.010300
3.5	70	39	17.5	635.010350
4	75	43	20	635.010400
4.5	80	47	22.5	635.010450
5	86	52	25	635.010500
5.5	93	57	27.5	635.010550
6	93	57	30	635.010600
6.5	101	63	32.5	635.010650
7	109	69	35	635.010700
7.5	109	69	37.5	635.010750
8	117	75	40	635.010800
8.5	117	75	42.5	635.010850
9	125	81	45	635.010900
9.5	125	81	47.5	635.010950
10	133	87	50	635.011000
10.5	133	87	52.5	635.011050
11	142	94	55	635.011100
11.5	142	94	57.5	635.011150
12	151	101	60	635.011200
12.5	151	101	62.5	635.011250

+ The affordable, robust drill bit for machining stainless steel and heat-resistant steels. Suitable for general, broad applications in steel up to 1000 N/mm² strength, as well as cast iron

FEATURES

- Self-centering, extremely robust, quiet drilling and a high degree of break resistance
- Cylindrical shank
- 118 degree angle tip

APPLICATIONS

- Ideal for construction sites and assembly applications
- Stainless steel, steel, cast iron

Solid Carbide TiALN Twist Drill



Diameter (mm)	Length (mm)	Chip Flute Length (mm)	Shaft Diameter (mm)	Art. No.
2	49	24	2	544.3000351
4	75	43	4	544.3000371
6	93	57	6	544.3000391
8	117	75	8	544.3000411
10	133	87	10	544.3000431
12	151	101	12	544.3000437

+ Particularly suitable for drilling high-strength steels, chromium-nickel steels, chilled cast iron, grey cast iron, cast steel, manganese high carbon steel, bronze, aluminum with high silicon content and other difficult-to-machine materials.

FEATURES

- Solid carbide with TiALN coating
- Cylindrical shank
- 118 degree angle tip
- DIN 338

APPLICATIONS

- High-strength steels, chromium-nickel steels, chilled cast iron, grey cast iron, cast steel, manganese high carbon steel, bronze, aluminum with high silicon content and other difficult-to-machine materials

**A Carbide Bit is
worth the investment**

Solid Carbide TiAlN Twist Drill
544.3000...

MAYKESTAG 6157

FOR DRILLING
THE HARDEST
OF MATERIALS

Armoured
vehicle made of
ballistic steel!

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to see our brochure!**

02

DRILL INDEXES & ASSORTMENTS

ThunderBit® Drill Index

Art. No. 627.100 • 29 pcs.

CONTENTS

29 drill bits, 1/16" to 1/2" by 64th,
protective indexed metal case

+ **Note:** All dia. larger
than 3/8" come with a
reduced shank



ThunderBit® Letter Drill - Index (A - Z)

Art. No. 627.101 • 26 pcs.

CONTENTS

26 piece set, black & bronze oxide,
high speed steel



ThunderBit® Number Drill - Index (1 - 60)

Art. No. 627.102 • 60 pcs.

CONTENTS

60 piece set, bronze oxide,
high speed steel



Drill Indexes & Assortments

ThunderBit® Drill Index Mechanic's Size

Art. No. 627.1100 • 21 pcs.

CONTENTS

21 piece set, sizes $\frac{1}{16}$ " – $\frac{3}{8}$ "



HSS Heavy Duty ThunderBit® Drill Index

Art. No. 627.90595 • 8 pcs.

CONTENTS

Heavy duty $\frac{1}{2}$ " reduced-flatted shank Silver & Demming drill set, black & bronze oxide.

8 pieces - One of Each: $\frac{9}{16}$, $\frac{5}{8}$, $1\frac{1}{16}$, $\frac{3}{4}$, $1\frac{3}{16}$, $\frac{7}{8}$, $1\frac{5}{16}$, 1", moulded plastic case

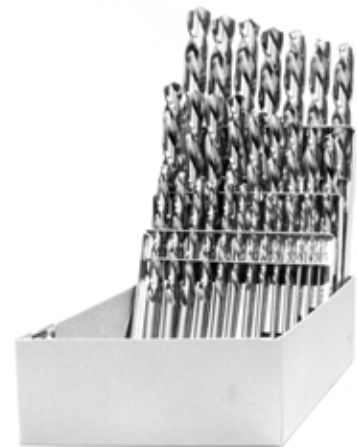


Left-Hand Drill Assortment

Art. No. 624.11100 • 29 pcs.

CONTENTS

29 piece set, sizes $\frac{1}{16}$ " – $\frac{1}{2}$ " by 64^{ths}

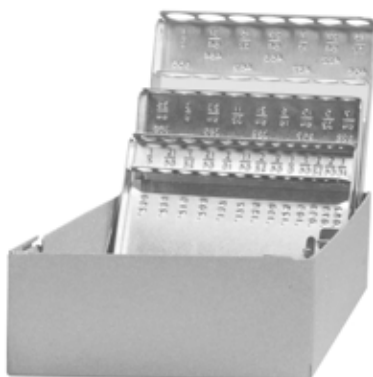


Empty Drill Index

Art. No. 627.10

CONTENTS

29 Compartments, $\frac{1}{16}$ " – $\frac{1}{2}$ "



Metric High Speed Steel Drill Bit Indexes - DIN 338

Art. No. 634.4 • 19 pcs.

CONTENTS

19 twist drills from 1.0 x 10.0mm/0.5 mm intervals



Metric High Speed Steel Drill Bit Indexes - DIN 338

Art. No. 634.6 • 25pcs.

CONTENTS

25 twist drills from 1.0 x 13.0mm/0.5 mm intervals



03

STEP DRILLS & REAMERS

Twist Drill HSS DIN 338 Smart Step

Art. No. 624.930001 - 19 pcs.

+ High-performance drill with unique **SMART STEP** technology.

FEATURES

- Stepped drill bit tip geometry (from dia. 2.5 mm)
- Precise circular holes without centre-punching
- Extremely convenient drilling
- Saves pre-drilling, precise spot drilling without running off centre
- Angled drilling possible
- Simple core drilling or enlarging an existing drill hole
- Perfect for drilling out rivets
- Ideal for window construction
- Significantly quicker than conventional twist drills bits
- Tri-shank (dia. 4mm) for optimum power transmission

APPLICATIONS

- For high-precision, circular through holes for handguided use in steel up to 1000 N/mm², aluminium, plastic, non-ferrous metals, hardwood and softwood.
- Perfect for rivet holes; drilling sheet metal or thin-walled profile materials (e.g. aluminium/window profiles)
- Ideal for high-precision, comfortable and fast work in solid material (e.g. in steel up to a strength of 1000 N/mm² aluminium and plastics)



CONTENTS FOR ART. NO. 624.930001

Designation	Art. No.
Twist drill HSS DIN 338 SMART STEP 1 mm	624.930100
Twist drill HSS DIN 338 SMART STEP 1.5 mm	624.930150
Twist drill HSS DIN 338 SMART STEP 2.0 mm	624.930200
Twist drill HSS DIN 338 SMART STEP 2.5 mm	624.930250
Twist drill HSS DIN 338 SMART STEP 3.0 mm	624.930300
Twist drill HSS DIN 338 SMART STEP 3.5 mm	624.930350
Twist drill HSS DIN 338 SMART STEP 4.0 mm	624.930400
Twist drill HSS DIN 338 SMART STEP 4.5 mm	624.930450
Twist drill HSS DIN 338 SMART STEP 5.0 mm	624.930500
Twist drill HSS DIN 338 SMART STEP 5.5 mm	624.930550
Twist drill HSS DIN 338 SMART STEP 6.0 mm	624.930600
Twist drill HSS DIN 338 SMART STEP 6.5 mm	624.930650
Twist drill HSS DIN 338 SMART STEP 7.0 mm	624.930700
Twist drill HSS DIN 338 SMART STEP 7.5 mm	624.930750
Twist drill HSS DIN 338 SMART STEP 8.0 mm	624.930800
Twist drill HSS DIN 338 SMART STEP 8.5 mm	624.930850
Twist drill HSS DIN 338 SMART STEP 9.0 mm	624.930900
Twist drill HSS DIN 338 SMART STEP 9.5 mm	624.930950
Twist drill HSS DIN 338 SMART STEP 10.0 mm	624.931000

HSS-E Step Drill



+ Note: Increase life span by using Würth Cut + Cool Cutting and Drilling Oil (**Art. No. 893.050004**)



FEATURES

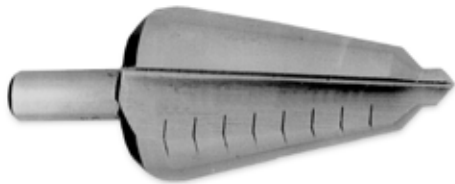
- CBN (cubical boron nitride)
- Suitable for material thickness up to 4 mm
- Centering, drilling and deburring in one step
- Less pressure needed due to specially ground angle
- Sharp cutting edges produce exact hole sizes
- Extended service life due to radial and axial relief grinding

P. QTY 1

RECOMMENDED CUTTING SPEED (RPM)

Non-Ferrous Metals	Steel Unhardened St 14-St 37	High Grade Stainless	Duro-Plastics	Thermo-Plastics	Drill Diameter (mm)	Art. No.
2400 - 800	1350 - 460	1200 - 460	1200 - 400	1200 - 550	4 - 12	694.022412
2400 - 320	1350 - 185	1200 - 160	1200 - 160	1600 - 220	4 - 30	694.022430

HSS Reamer



Size	Drill Diameter (mm)	Total Length (mm)	Shank Dia. (mm)	Art. No.
1	3 - 14	53	6	694.02414
2	5 - 20	61	8	694.02420

FEATURES

- CBN (cubical boron nitride)
- Universally suitable; stepless drilling and widening of holes with a diameter range of 3 - 20 mm
- Suitable for drilling thin sheet metal
- No counter sinking or pre-drilling required
- Burr-free drilling without deforming the sheet metal

- Excellent heat conductivity for improved tool life due to radial and axial relief grinding

P. QTY 1

Spiral Flute Car Reamer



+ Hole Buster™ super premium 50-AG flatted tri-shank design.

Diam.	Point Diameter	Min. Starting	Overall Length	Shank Diameter	Art. No.
3/8"	0.250"	5/16"	4 3/8"	3/8"	694.06390
1/2"	0.281"	3/8"	5 7/8"	1/2"	694.06400
5/16"	0.343"	7/16"	5 7/8"	1/2"	694.06410
5/8"	0.343"	7/16"	6 3/8"	1/2"	694.06420
3/4"	0.406"	1/2"	6 7/8"	1/2"	694.06440
1"	0.594"	7/8"	6 7/8"	1/2"	694.06480

DESIGNED FOR reaming of structural steel plate commonly found in truck frames, rail cars, bridges and pressure vessels.

FEATURES

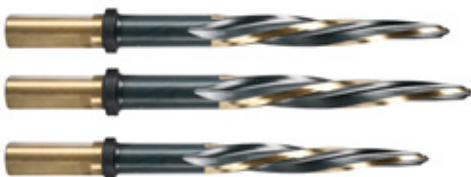
- Special HI-TUNGSTEN tool steel
- All tools are constructed with left-hand spiral and right-hand cut. Left spiral eliminates the tendency of the reamer to hog into holes; this feature makes a stop collar unnecessary

P. QTY 1

+ Note: Use only to enlarge previously formed or drilled holes

Spiral Reamer Set

Art. No. 694.05000



FEATURES

- 1/2", 3-flatted shank prevents slippage in three-jaw chuck
- High speed steel, black & bronze oxide
- Ideal for maintenance and repair

P. QTY 1

Size	Decimal Equivalent	Flute Length	Overall Length
1/2"	0.5000	3 13/16"	5 13/16"
5/8"	0.6250	4 1/2"	6 9/16"
3/4"	0.7500	4 13/16"	7"

04

END MILLS



End Mill HSS-C08
Prefix 544



End Mill HSS-C08 TiAlN
Prefix 544



HSS End Mill
Prefix 654

End Mill HSS-C08 TiAlN



Diam. (mm)	Length (mm)	Chip Flute Length (mm)	Shaft Diameter (mm)	Art. No.
2	51	7	6	544.3600641
4	55	11	6	544.3600645
5	57	13	6	544.3600647
6	57	13	6	544.3600649
8	69	19	10	544.3600653
10	72	22	10	544.3600657
12	83	26	12	544.3600659
14	83	26	12	544.3600661
18	92	32	16	544.3600664
20	104	38	20	544.3600665

- + Suitable for a wide range of applications including both low-strength and difficult-to-machine materials.**

FEATURES

- Quality high speed steel with 8% cobalt and TiAlN coating
- 90 degree angle tip
- DIN 844K, centre-cutting
- Superior performance
- Long service life

APPLICATIONS

- Construction and tool steels
- Also suitable for non-ferrous metals, cobalt and nickel alloys, titanium and titanium alloys

End Mill HSS-C08



Diam. (mm)	Length (mm)	Chip Flute Length (mm)	Shaft Diameter (mm)	Art. No.
4	55	11	6	544.3600605
5	57	13	6	544.3600607
6	57	13	6	544.3600609
8	69	19	10	544.3600613
10	72	22	10	544.3600617
12	83	26	12	544.3600619
14	83	26	12	544.3600621
18	92	32	16	544.3600624
20	104	38	20	544.3600625

- + Suitable for a wide range of applications including both low-strength and difficult-to-machine materials.**

FEATURES

- Quality high speed steel with 8% cobalt
- 90 degree angle tip
- DIN 844K, centre-cutting

APPLICATIONS

- Construction and tool steels
- Also suitable for non-ferrous metals, cobalt and nickel alloys, titanium and titanium alloys

HSS End Mills



Size	Shank Dia.	Flute Length	Overall Length	No. of flutes	Art. No.
1/4"	3/8"	3/8"	2 7/16"	4	654.14
1/8"		3/4"	2 1/2"		654.516
3/8"		3/4"	2 1/2"		654.38
7/16"		1"	2 11/16"		654.716
1/2"	1/2"	1 1/4"	3 1/4"		654.12

- + Single End, Multi Flute, Non-Center Cutting**

FEATURES

- Shank type: parallel shank with flat
- 4 spiral flutes
- Cutting length: regular, sizes 1/8" – 3/4"

APPLICATIONS

For profile milling and producing open slots or pockets where a plunge feed-in is not required.

P. QTY 1



**YOUR FAVOURITE
PRODUCT IS JUST A
CLICK AWAY!**



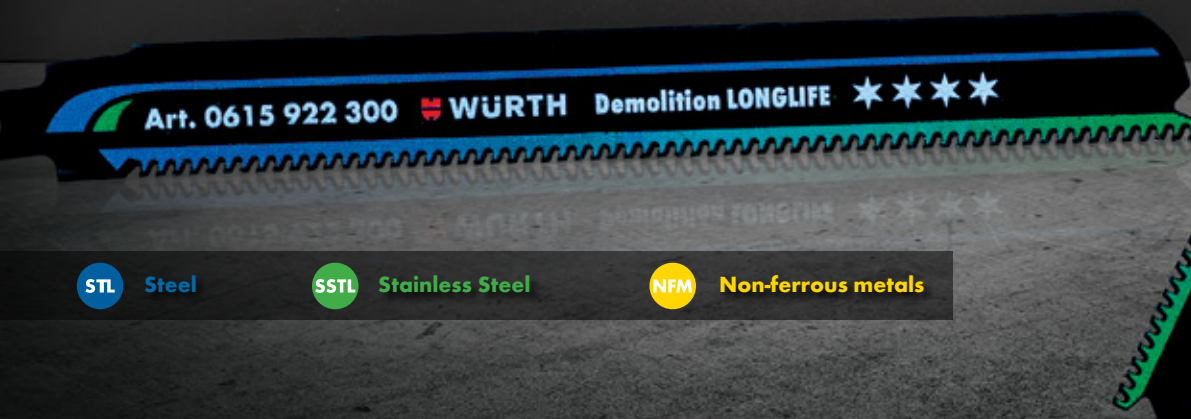
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Sabre Saw Blades **METAL DEMOLITION**

615.922300 • L 228 m

For sawing metal sheets,
non-ferrous metal, steel
and aluminium



STL Steel

SSTL Stainless Steel

NFM Non-ferrous metals

05 SPOT WELD DRILLING

Spot Weld Drill Bits



Ø (mm)	Total Length (mm)	Flute length (mm)	Max. Speed	Art. No.
6	66	27	up to 1,200 rpm	710.0066
8	79	36	up to 950 rpm	710.0088
10	88	44	up to 730 rpm	710.01010

HSCO Spot Weld Drill Bit

TiN - Titanium Nitride coated

- Tool life extended two to three times
- High cutting speed



Drilling Ø (mm)	A (mm)	B (mm)	C (mm)	Max. RPM	Art. No.	P. Qty.
8	44.7	17	7.5	950	710.808	1

SUITABLE FOR C-CLAMP DRILLS

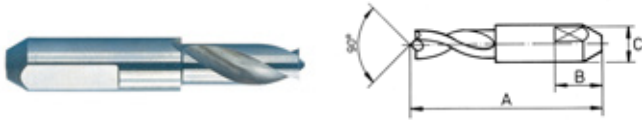
- No need for centre punching
- High cutting speed



CHECK OUT OUR
**MASTER
GRINDING
BROCHURE**



Spot Weld Drill Bits



Drilling Ø (mm)	A (mm)	B (mm)	C (mm)	Art. No.	P. Qty.
6	44	16	7.5	710.60	1
8				710.80	
9				710.90	

HSCO Spot Weld Drill Bit

- Suitable for C-clamp drills
- No need for centre-punching



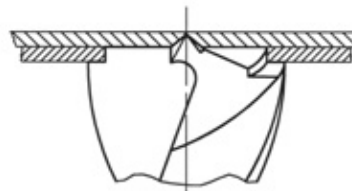
Ø (mm)	Total Length (mm)	Flute length (mm)	Max. Speed	Art. No.
6	66	27	up to 920 rpm	710.6
8	79	36	up to 700 rpm	710.8
10	86	41	up to 700 rpm	710.10

HSS Spot Weld Drill Bit

- Fixed centering point eliminates need for a centre punch



+ For the quick and precise drilling of spot welds in car bodywork repairs. The PLUS centering tip guarantees a long service life.



Drilling Ø (mm)	Stop Ø (mm)	Total length (mm)	Recommended RPM	Art. No.	P. Qty.
7.5	10	88	600 - 670	710.0010	1

HSCO Spot Weld Drill Bit with Step

The step at the tip of the bit acts as a stop and indicates to the user the exact drilling depth.

- This prevents unintentional drilling through into the second sheet of metal.

If the user notices that the step is touching the metal only on one side, then the drill is tilting.

- The tilt can then be easily corrected.

Improved PLUS centering tip for modern high-strength car body sheets.

- The centering tip has a long service life.



Two Piece Spring Spot Weld Bit



Art. No. 698.1

FEATURES

- Right-hand cutting
- Special ground edge facilitates entry of the twist drill into the material
- No centre punch required
- Drill does not drift from the drilling location
- Spring loaded/Anti-skate tip
- Specially suitable for working on thin-gauge material

AREAS OF APPLICATION

- Bodywork & sheet metal processing workshops
- Apparatus construction

ADDITIONAL TOOLS

Replacement end **Art. No. 698.01**



3-Edged Solid Carbide Spot Weld Cutter



- + **For precision milling/drilling out of spot welds on vehicle bodies with high-strength steel plates in vehicles of all types, A-pillars, B-pillars, door sills, etc.**

Excellent centering of the drill bit on the spot weld.

- Broad yet stable geometry.

Very long service life.

Drill bit tip features innovative Magma coating.

- Innovative layered coating of TiN and TiAN increases durability and performance.

APPLICATIONS

- With its shorter length, **Art. No. 710.810800** is suitable for use with C-Clamp drills.
- With its triangular shaft, **Art. No. 710.811800** is only suitable for use in 3-jaw chucks drills.

INSTRUCTIONS

- The solid carbide material is very brittle due to its extremely high hardness level and is susceptible to breakage if handled improperly.
- Insert drill bit precisely and at a right angle. First position the drill bit in the centre and then drill using consistent contact pressure.
- We recommend not exceeding a constant speed of 1800 rpm while drilling.

Art. No.	710.810800	710.811800
P. Qty.	1	
Diameter - C	8 mm	8 mm
Length - A	45 mm	80 mm
Shank Length - B	35 mm	20 mm
Shank Diameter	7.5 mm	8 mm
Shank Type	Cylindrical with single flat	Triangular
Material	Carbide	Carbide

- + **Note:** The following must absolutely be avoided: interrupted cuts, abrupt bit contact, lateral impacts, and dropping the bit.

06

MASONRY DRILLING

SDS Plus Quadro Hammer Drill Bits



+ Rotary hammer drill bit with four carbide cutting edges. Allows for rapid and precise drilling with a longer service life against concrete and rebar ANSI B212.15-1994.

FEATURES

- Solid carbide head
- 4 carbide cutting teeth
- Up to 150% higher lifetime in reinforcement than conventional hammer drill bits
- Excellent resistance to high temperatures
- Rapid drilling progress and longer lifetime due to new flute design

APPLICATIONS

- Drilled holes for mechanical anchors in reinforced and unreinforced concrete
- Drilled holes for subsequent reinforcement connection
- Drilling of breakthrough holes for tubes and cables

SUITABLE FOR

- Concrete, reinforced concrete, natural stone, brick, masonry

Head Type	Diameter (in)	Length (in)	Working Length (in)	Art. No.
Solid Carbide Head	3/16"	6 1/2"	4	648.316612
	3/16"	10 1/2"	8	648.316105
	1/4"	6 1/2"	4	648.014612
	1/4"	10 1/4"	8	648.014102
	5/16"	6 1/2"	4	648.516612
Single-piece Carbide Head	5/16"	12 1/2"	10	648.516125
	3/8"	6 1/4"	4	648.038614
	3/8"	12 1/4"	10	648.038122
	7/16"	12 1/4"	10	648.716122
	1/2"	6 1/4"	4	648.012614
Three-piece Carbide Head	1/2"	12 1/4"	10	648.012122
	5/8"	8 1/4"	6	648.058814
	5/8"	12 1/4"	10	648.058122
	3/4"	12	10	648.034012
	7/8"	12	10	648.078012

4 Plus Rotary Hammer Drill Bit



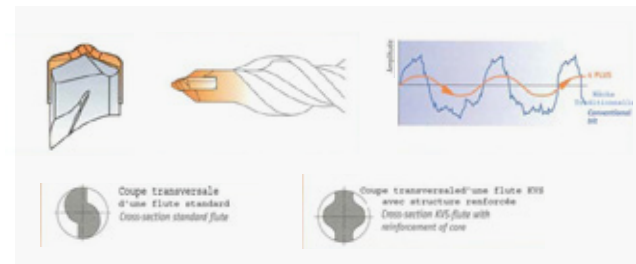
+ For use in concrete, masonry and natural stone

Dia. (in)	Working Length (in)	Total Length (in)	Art. No.
5/32	2	4 1/4	648.5322
5/32	4	6 1/4	648.5324
3/16	2	4 1/4	648.3162*
3/16	6	6 1/4	648.3164
1/4	2	4 1/4	648.142*
1/4	4	6 1/4	648.144
1/4	6	8 1/4	648.146*
1/4	12	14	648.1412*
5/16	4	6 1/4	648.5164
3/8	4	6 1/4	648.384
1/2	8	10 1/4	648.128
5/8	6	8	648.586
5/8	10	12	648.5810

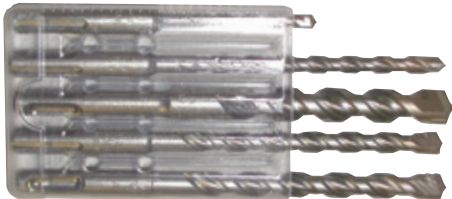
* Available OnDemand

COMPATIBLE WITH SDS

- The new fast and durable carbide tip provides aggressive, easy centering and fast drilling from the very start. Steel reinforcement no longer presents a problem.
- The dynamic, chisel-shaped drill bit head penetrates rapidly into the material and simultaneously feeds the drilling dust into the multi-fluted spiral.
- The patented spacious, multi-fluted KVS-Spiral quickly removes drilling dust from the hole, saving both time and money.
- The unique reinforced flute geometry (KVS-flute) reduces vibration and transfers more impact energy from the hammer to the drilling head, thus remarkably increasing drilling speed and life expectancy. Drilling is less strenuous for the operator and for the rotary hammer.
- Modern thermal treatment and a special surface finish reduce the wear of the bit and improve its resistance against bending forces.



4 Plus Drill Set



Art. No. 648.5

Compatible with SDS

CONTAINS 1 EACH OF

3/8" x 4", 1/4" x 6", 5/16" x 6", 3/8" x 6", 1/2" x 6"

Masonry Drill Bits



+ 118° point, carbide-tip, masonry, regular helix, black oxide

Size	Shank Dia.	Overall Length	Art. No.	P. Qty.
1/8"	1/8"	3"	647.18	2
5/32"	5/32"	3 1/2"	647.532	
3/16"	3/16"	4"	647.316	
1/4"	1/4"	4"	647.14.4	
1/4"	1/4"	6"	647.14.6	
5/16"	1/4"	4"	647.516.4	
5/16"	1/4"	6"	647.516.6*	
3/8"	1/4"	4"	647.38.4	
3/8"	1/4"	6"	647.38.6	
1/2"	3/8"	6"	647.12.6	

* Available OnDemand

FEATURES

- Wide flutes improve dust removal
- For best performance, use slow speed and apply enough feed pressure to keep the drill cutting
- Recommended for use in brick, concrete and sandstone

07

COUNTERSINK SETS

Deburring &
countersinking
all in one go



Conical Countersink Set

Art. No. 694.02101

+ HSS-E, 90° with diagonal hole

FEATURES

- CBN (cubical boron nitride), deep ground
- For deburring 90° countersinks
- Suitable for almost all materials
- The even-running cone-envelope relief grinding results in a light, paring cut

Countersink range in mm	Head Dia. in mm	Total length in mm	Shank dia in mm
2 - 5	10	45	6
5 - 10	14	48	8
10 - 15	21	65	10
15 - 20	28	85	12

- Even, chatter-free, burr-free & high surface quality via chip removal in the shank direction via angled drilling
- Speed table included

CONTENTS

- Contains one of each of the countersink ranges 2 - 5, 5 - 10, 10 - 15, 15 - 20mm

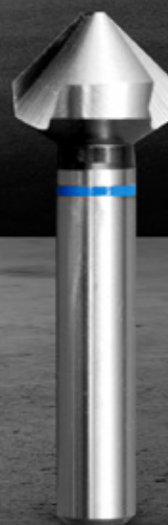
More info
on page
43 - 47

+ **Note:** Increase in service life & cutting power when used with Eco Cutting and Drilling Oil (**Art. No. 893.050012**)



Standard speed values for Conical Countersinks with diagonal hole

Material	Non - ferrous metal	Steel sheets soft, e.g. St 4 - St 37	Plastics, Duroplast, Thermoplast	Cast iron up to 250 N/mm²	Aluminum alloys
Cutting speed m/min.	20	15	15 - 20	10	25
dia. in mm	n = rpm	n = rpm	n = rpm	n = rpm	n = rpm
2 - 5	900 - 1200	600 - 900	900 - 1200	500 - 700	1200 - 1600
5 - 10	500 - 700	300 - 500	500 - 700	300 - 400	700 - 900
10 - 15	300 - 500	250 - 300	300 - 500	200 - 300	500 - 700
15 - 20	200 - 300	150 - 250	200 - 300	100 - 200	300 - 500



Metric Countersink Set

Art. No. 694.01701

FEATURES

- Contains one of each of \varnothing 6.3, 8.3, 10.4, 12.4, 16.5, 20.5 mm
- HSS, for standard, commercial steels
- DIN 335, type C (round shaft)
- CBN (cubical boron nitride), deep ground
- Deburring and countersinking in one go

+ 90°, with triple cutting edges

Standard speed values for countersinkers

Medium	For general construction steel 900 N/mm ² St 32- St 70 cast iron, non-ferrous metals
Cutting speed m/min.	10 - 15
\varnothing mm	n = r.p.m.
6.3	500 - 800
8.3	400 - 600
10.4	300 - 500
12.4	250 - 400
16.5	200 - 300
20.5	150 - 250

- Special grinding of the tool allows for chatter-free handling, smooth surface structure, excellent burr removal and extended tool life

CONTENTS

- One countersink bit each of \varnothing 6.3, 8.3, 10.4, 12.4, 16.5, 20.5 mm

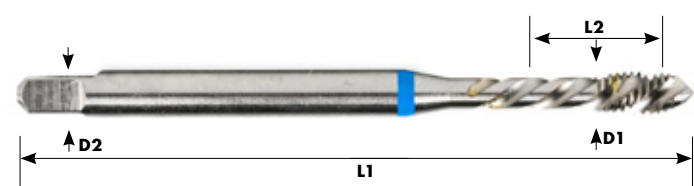
Countersink \varnothing (mm)	For Counter Sunk Screws	Total Length (mm)	Shank \varnothing (mm)
6.3	M 3	45	5
8.3	M 4	50	6
10.4	M 5	50	6
12.4	M 6	56	8
16.5	M 8	60	10
20.5	M 10	63	10

08

TAPS & DIES



Tapping Machine Taps HSS-E



Ø = D1	Pitch	D2	L1	L2	Square Size (mm)	Art No.	P. Qty.
M4	0.7	4.5	63	8	3.4	653.04	1
M5	0.8	6.0	70	10	4.9	653.05	
M6	1.0	6.0	80	12	4.9	653.06	
M8	1.25	8.0	90	15	6.2	653.08	

Plug hole

Technical Data	
Surface	Bright
Groove	40° right grooved
Relief Grinding	Flanks relief ground
Shaft	Up to M10 reinforced shaft, from M12 overrun shaft
Centering	Up to M5 solid tip, M6 - M10 turned tip, from M12 interior centering
Thread Depth	Approx. 3 x d1
Chamfer	Short, 2 - 3 turns

TAPPING MACHINE TAPS HSS-E

- For pocket and through holes
- For fabrication of metric ISO thread
- DIN 13 according to tolerance range 6H
- Outstanding features of Zebra tapping machine taps:

HIGHEST QUALITY

- Cobalt alloyed basic materials
- Constant material receiving inspections
- Highest precision in production

SPECIAL GEOMETRY

- Low wear
- Better chip removal
- More accurate thread

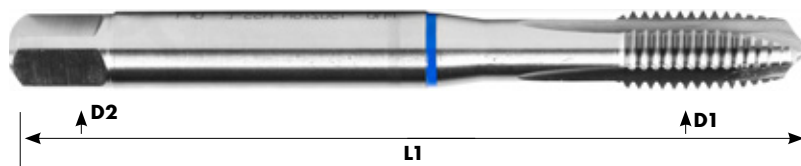
APPLICATION AREAS

Unalloyed steels and tempering steels up to approx. **1000 N/mm** strength, machining steels, brass, long-chipping, steel castings, aluminum above 10% Si, zinc alloy, synthetics, copper, gunmetal.

Material Groups	Material Designations Examples	Cutting speed V = m/min	Speed at Ø					Blue Ring	
			3	5	8	12	18	653...	653.0
Unalloyed steels up to 800 N/mm ²	C10, C35, CK10, CK35, 9S20, 9SMn28, 9SMnPb36, St33-, ST60-2	10 - 15	1062 - 1592	637 - 955	398 - 597	295 - 398	199 - 299	++	++
Unalloyed steels up to 1000 N/mm ² tempering steels	C45, C60, CK45, CK60, 16MnCr5, 45S20, 60S20, 41Cr4, 36Mn5, 42CrMo4, C60W3/C135W2	4 - 10	425 - 1062	255 - 637	159 - 398	106 - 295	71 - 177	++	++
Alloyed tool steels, rust and acid resistant steels	14NiCr18, 54NiCrMoS6, X10Cr13, X100CrMoV51	4 - 8	425 - 849	255 - 509	159 - 318	106 - 212	71 - 142	+	+
Steel casting, annealed cast iron, nodular graphite iron	GS-38, GS-45, GS-70, GTW35, GTW60, GTS35, GTS70, GGG38, GGG45, GGG70	6 - 12	637 - 1274	382 - 764	239 - 478	159 - 318	106 - 212	++	++
Copper	F-Cu, SF-Cu	15 - 20	1592 - 2123	955 - 1274	597 - 796	398 - 531	299 - 354	+	+
Electrolytic copper	KE-Cu, E-Cu	8 - 15	849 - 1592	509 - 955	318 - 597	212 - 398	142 - 299		+
Brass, long-chipping	CuZn37 (Ms63), CuZn10, CuZn30	15 - 20	1592 - 2123	955 - 1274	597 - 796	398 - 531	299 - 354	++	+
Bronze, soft, gunmetal tin bronze	G-CuSn10Zn, CuSn8 (SnBz8), G-CuSn5ZnPb(Rg5), (Rg10)	5 - 12	531 - 1274	318 - 764	199 - 478	133 - 318	88 - 212	++	+
Bronze, hard	CuAl8(AlBz8), CuAl10(AlBz10Ni), Eterna bronze, beryllium bronze	5 - 10	531 - 1062	318 - 637	199 - 398	133 - 265	88 - 177	+	
Al alloy < 10%	G-AlSi6Cu4, G-AlSi10Mg, Si G-AlSi5Cu1	18 - 20	1911 - 2123	1146 - 1274	717 - 796	478 - 531	318 - 354	+	
Al alloy < 10%	G-AlSi12, GD-AlSi12, Si AlSi12CuNi	14 - 16	1486 - 1699	892 - 1019	557 - 637	372 - 425	248 - 283	++	++
Zinc alloy	GD-ZnAl4, GD-ZnAl4Cu1, GK-ZnAl4Cu3, GK-ZnAl6Cu1	20 - 25	2123 - 2654	1274 - 592	796 - 955	531 - 663	354 - 442	+	

++ Good suitability + Limited suitability

Tapping Machine Taps HSS-E



Ø = D1	Pitch	D2	L1	L2	Square size (mm)	Art No.	P. Qty.
M5	0.8	6.0	70	14	4.9	653.5	1
M6	1.0	6.0	80	16	4.9	653.6	
M8	1.25	8.0	90	18	6.2	653.8	
M10	1.5	10.0	100	20	8.0	653.10	

Through hole

Technical Data

Surface	Bright
Groove	Straight grooved
Relief Grinding	Flanks relief ground
Shaft	Up to M10 reinforced shaft, from M12 overrun shaft
Centering	Up to M5 solid tip, M6 - M10 turned tip, from M12 interior centering
Thread Depth	M2.5 approx. 2.5 x d; M3-M10 approx. 3 x d1; from M12 approx. 3 x d1
Chamfer	4 - 5 turns, curling tap

Standard High Speed Steel Hand Tap

+ Straight Flute hand Taps



TIP:
Straight Flute taps
can be used for
Through Holes
or Blind Holes

High Speed Steel Material
Bronze Oxide Coating/Finish
Chamfer: Taper = 7 - 10 threads long
Plug = 3 - 5 threads long
Bottoming: 1 - 2 threads long

P. QTY 1

COARSE THREAD (UNC)

Type	Size	No. of Flutes	Drill size	Art. No.
Bottoming	1/4-20"	4	7	640.711420
	5/16-18"		F	640.715618
	3/8-16"		5/16	640.713816
	7/16-14"		U	640.717614*
	1/2-13"		27/64	640.711213
Plug	6-32"	4	36	640.81632
	8-32"		29	640.81832
	10-24"		25	640.811024
	1/4-20"		7	640.811420
	5/16-18"		F	640.815618
	3/8-16"		5/16	640.813816
	7/16-14"		U	640.817614
	1/2-13"		27/64	640.811213
	3/8-11"		17/32	640.815811
	3/4-10"		21/32	640.813410
Taper	1/4-20"	4	7	640.911420
	5/16-18"		U	640.915618
	3/8-16"		5/16	640.913816
	7/16-14"		U	640.917614
	1/2-13"		29/64	640.911213

FINE THREAD (UNF)

Type	Size	No. of Flutes	Drill size	Art. No.
Bottoming	1/4-28"	4	3	640.721428*
	5/16-24"		I	640.725624*
	3/8-24"		Q	640.723824*
	7/16-20"		25/64	640.727620*
	1/2-20"		29/64	640.72220*
Plug	10-32"	4	21	640.811032
	1/4-28"		3	640.821428
	5/16-24"		I	640.825624*
	3/8-24"		Q	640.823824*
	7/16-20"		25/64	640.827620*
Taper	5/8-18"	4	37/64	640.825818
	3/4-16"		11/16	640.823416
	1/4-28"		3	640.921428*
	5/16-24"		I	640.925624
	3/8-24"		Q	640.923824*
	7/16-20"	4	25/64	640.927620
	1/2-20"		29/64	640.92220

* Available OnDemand

VERSATILITY, STRENGTH, PRECISION

DIAMOND CUTTING DISCS Prefix 552



Ask your Würth Sales Rep for more information

European-Style Metric Hand Taps



+ These hand taps are designed for a gradual multi-step tapping process. This tapping process is easier, results in less crooked threads, and a more precise finish.

DIN 352 HSS

Taps for metric ISO threads (metric "coarse") according to DIN 13



ASSORTMENT Hand Tap Set

Art. No. 639.01 • 21 pcs.

CONTENTS

1 set of First, Second and Finishing metric coarse taps for each of M3, M4, M5, M6, M8, M10, M12.

FIRST

- This tap is for preliminary cutting of threads. It creates a partial cut, and must be followed by the finishing tap to complete the thread cutting.

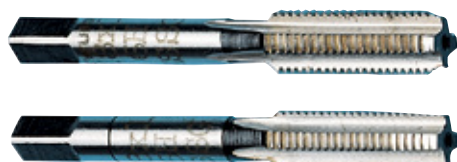
FINISHING

- This tap is for final thread cutting and is a required step when using the first tap. It results in a fully finished thread.
- Specially designed for high speed, close tolerance tapping applications.
- Can be used with a variety of ferrous and non-ferrous materials, in through or blind holes.

APPLICATIONS

- Ideal for brass or cast iron fittings.
- Suitable for engine or brakes; specifically for making threads for bolts.

Thread Ø (mm)	Pitch (mm)	Length (mm)	Thread length (mm)	Shank Ø (mm)	Square Shank (mm)	First Art. No.	Finishing Art. No.	P. Qty.
M6	1	50	16	6	4.9	640.1..6	640.3..6	1
M8	1.25	56	22	6	4.9	640.1..8	640.3..8	
M10	1.5	70	24	7	5.5	640.1..10	640.3..10	
M12	1.75	75	29	9	7	640.1..12	640.3..12	
M14	2	80	30	11	9	640.1..14	640.3..14	
M16	2	80	32	12	9	640.1..16	640.3..16	



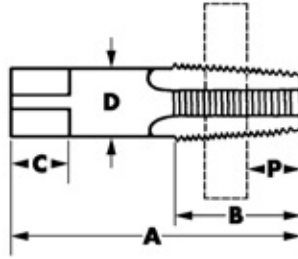
DIN 2181 HSS

For metric ISO fine threads according to DIN 13

Thread Ø (mm)	Pitch (mm)	Length (mm)	Thread length (mm)	Shank Ø (mm)	Square Shank (mm)	First Art. No.	Finishing Art. No.	P. Qty.
M8	1	56	22	6	4.9	642.18.1	642.38.1	1
M10	1	63	20	7	5.5	642.110.1	642.310.1	
M10	1.25	70	24	7	5.5	642.110.125	642.310.125	
M12	1	70	22	9	7	642.112.1*	642.312.1*	
M12	1.25	70	22	9	7	642.112.125	642.312.125	
M12	1.5	70	22	9	7	642.112.15*	642.312.15	
M14	1.25	70	22	11	9	642.114.125	642.314.125	
M14	1.5	70	22	11	9	642.114.15	642.314.15	
M16	1.5	70	22	12	9	642.116.15*	642.316.15	

* Available OnDemand

NPT Taper Pipe Taps



+ NPT taper pipe taps made of high speed steel for tapping pipe fittings of couplings.

FEATURES

- High Speed Steel
- Bronze Oxide surface treatment for easier tapping, higher speeds and greater abrasion resistance
- Precision ground cutting surfaces for precise thread production

TECHNICAL DATA

- Material: High Speed Steel
- Coating/Finish: Bronze Oxide

Thread Dia./ Pitch	Thread	# of Flutes	Overall Length (A)	Flute Length (B)	Square Length (C)	Shank Diam. (D)	Projection (P)	Art. No.	P. Qty.
1/8"-27	NPT	4	2 1/8"	3/4"	3/8"	0.4375"	0.312"	640.71250	1
1/4"-18			2 7/16"	1 1/16"	7/16"	0.5625"	0.459"	640.71251	
3/8"-18			2 9/16"	1 1/16"	1/2"	0.7000"	0.454"	640.71252	
1/2"-14			3 1/8"	1 3/8"	5/8"	0.6875"	0.579"	640.71253	
3/4"-14		5	3 1/4"	1 3/8"	1 1/16"	0.9063"	0.565"	640.71254	

T-Handle Tap Wrench



FEATURES

- Sliding T-Handle is ideal for turning in confined areas
- Strong and rugged for easy handling and accurate tapping

Capacity	Art. No.
#0 - 1/4"	640.99901*
#12 - 5/16"	640.99950*

* Available OnDemand



ASSORTMENT

Tap & Die Set

Art. No. 652.69999 • 64 pcs.

+ 64 Piece Set in molded Case, 28 Taps and 28 Dies

CONTAINS

26 Plug style taps and 26 adjustable round dies (1", 1 1/2", 2" OD)

NATIONAL COARSE

1/2-20, 3/8-16, 1/2-13, 5/8-11, 7/8-9, 5/16-18, 7/16-14, 9/16-12, 3/4-10, 1-8, 4-40, 6-32, 8-32, 10-24, 12-24

NATIONAL FINE

1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, 10-32

NATIONAL SPECIAL: 1-14

INCLUDES

1/8-27 NPT, 1/4-18 NPT Pipe Taps and Pipe Dies, T-Handle Tap Wrench (#0-1/4), 2 adjustable Tap Wrenches (1/16-1/2" and 1/4-1 1/8"), 3 Round Dies Stocks (1" O.D., 1 1/2" O.D., 2" O.D.), Screw pitch gauge and screwdriver.

TAP & DIE ASSORTMENTS

64 Piece Set in molded Case,
28 Taps and 28 Dies



32 Piece Set in molded Case,
21 Taps and 11 Dies



TAP & DIE SET

Art. No. 652.69999 • 64 pcs.

CONTAINS

26 Plug style taps and 26 adjustable round dies (1", 1 1/2", 2" OD)

NATIONAL COARSE

1/2-20, 3/8-16, 1/2-13, 5/8-11, 7/8-9, 5/16-18, 7/16-14, 9/16-12, 3/4-10, 1-8, 4-40, 6-32, 8-32, 10-24, 12-24

NATIONAL FINE

1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, 10-32

NATIONAL SPECIAL

1-14

INCLUDES

1/8-27 NPT, 1/4-18 NPT Pipe Taps and Pipe Dies, T-Handle Tap Wrench (#0-1/4), 2 adjustable Tap Wrenches (1/16-1/2" and 1/4-1 1/8"), 3 Round Dies Stocks (1" O.D., 1-1/2" O.D., 2" O.D.), Screw pitch gauge and screwdriver.

PREMIUM TAP & DIE SET

Art. No. 5964.065200 • 32 pcs.

TAPS

1 set each of M 3 - 4 - 5 - 6 - 8 - 10 - 12

DIES

1 set each of M 3 - 4 - 5 - 6 - 8 - 10 - 12

STOCKS

1 each of 20 x 5 - 20 x 7 - 25 x 9 - 30 x 11 - 38 x 14

TAP HOLDERS

Adjustable nos. 1 + 2

INCLUDES

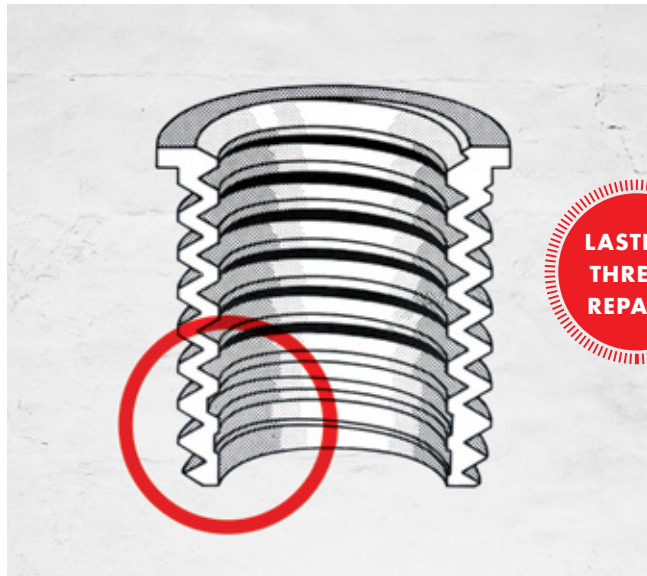
Starter tap, bottoming tap and finishing tap for each size

09

THREAD REPAIR



TIME-SERT®



LASTING
THREAD
REPAIRS

+ FOR PERFECT THREAD REINFORCEMENT & RENEWAL
AS USED ON SERIES PRODUCTION & REPAIR



CONVINCING ADVANTAGES

- TIME-SERT® is based on steel instead of wire inserts. It guarantees easy installation and allows for permanent full load use.
- TIME-SERT® is thin walled due to synchronized internal and external threads. Its thin cross-section allows for installation in areas of limited space and clearance material.
- TIME-SERT® is self locking due to forming of the component threads when inserted. The bushing will not pull torque out even when inserted or removed often.
- TIME-SERT® is media tight, i.e. by mating internal and external threads the thread is sealed against water, oil, other liquids and compressed gas.
- TIME-SERT® has a collar which allows for exact positioning in the material.

APPLICATION AREAS

Engine: Spark plug thread/stud thread

Aggregates: Fastenings of servo pump/alternator/air conditioning

Transmission: Transmission cover and mountings

Differentials: Studs, Axles: Fastenings, Mountings, Chassis, Body

- 1 TIME-SERT® insert.
- 2 Thin wall with synchronized internal and external thread.
- 3 Insertion tool position prior to insertion action.
- 4 Base material with cut thread and milled seat.
- 5 Threads of the lower section are not fully formed.
- 6 The insertion tool will form these unfinished threads and presses the TIME-SERT® insert firmly into the base material without the fear of pull out or torque out.

RECOMMENDED BY LEADING CAR MANUFACTURERS



TIME-SERT® Universal Kits & Inserts

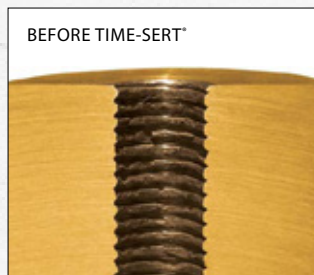
STANDARD

Replacement Parts

Tool Size	Thread Pitch	Drill	Counter Bore	Tap	Driver
1/4	20	699.2010 *	699.4010 *	699.6010 *	-
5/16	18	699.2020 *	699.4020	699.6020	699.8020
3/8	16	699.2030 *	699.4030	699.6030	-
7/16	14	-	699.4040 *	699.6040 *	699.8040 *
1/2	13	-	-	699.6050 *	699.8050

Technical Data: Imperial UNIC and UNF

INSERT		DRILL		COUNTER BORE		TAP
Thread	Thread Pitch	Drill	Diameter	Min. Dia.	Min. Depth.	Major Dia.
#6	32	#26	0.147	0.218	0.070	0.182
#8	32	#17	0.173	0.241	0.065	0.208
#10	24	13/64	0.203	0.288	0.075	0.247
	32			0.274		0.234
1/4	20	17/64	0.265	0.352		0.319
	28			0.216		0.300
5/16	18	21/64	0.328	0.430	0.085	0.388
	24			0.323	0.080	0.368
3/8	16	X	0.323	0.495	0.085	0.460
	24	W	0.386	0.473	0.080	0.432
7/16	14	29/64	0.453	0.571	0.110	0.534
	20			0.547	0.085	0.506
1/2	13	33/64	0.515	0.648	0.110	0.604
	20			0.610	0.085	0.569
9/16	12	37/64	0.578	0.711	0.130	0.675
	18			0.668	0.110	0.638
5/8	11	41/64	0.640	0.787	0.135	0.748
	18			0.740	0.110	0.701
3/4	10	25/32	0.765	0.953	0.135	0.885



Standard Inserts

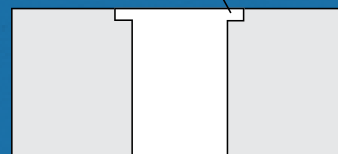
(Shaded areas indicate inserts supplied with the kit)

Size	Threads per Inch	Insert Length		Insert	Kit
		Inches	mm	Art. No.	Art. No.
#8	32	.250	6.3	-	-
#10	24	.370	9.4	699.1605 *	-
1/4	20	.380	9.4	699.1607	699.1506
		.500	12.7	699.1608	
5/16	18	.380	9.4	699.1609 *	-
		.450	11.4	699.1611	
	24	.620	15.7	699.1612	699.1508
		.520	11.4	699.1613 *	
3/8	16	.620	15.7	699.1614 *	699.1509
		.520	13.2	699.1615	
	24	.620	15.7	699.1616	699.1510
		.750	19.0	699.1617	
7/16	14	.520	13.2	699.1618	699.1511
		.600	15.2	699.1620	
	20	.870	22.0	699.1621	699.1512
		.600	15.2	699.1622 *	
1/2	13	.650	16.5	699.1623	699.1513
		1.000	25.4	699.1624	
	20	.650	16.5	699.1626	699.1514
		.650	16.5	699.1627	
5/8	11	.850	21.6	699.1627	699.1516
	18	.850	21.6	-	699.1518

* Available OnDemand

GENERAL REPAIR

Counterbore to accept head of insert



For production applications we recommend step drills for hole preparation and reversing tapping head for installation of inserts

METRIC

Replacement Parts

Tool Size	Thread Pitch	Drill	Counter Bore	Tap	Driver
6	1.0		699.5010*		699.9010*
8	1.25	699.3020*	699.5020*	699.7020	699.9020
10	1.5	699.3030*	699.5030*	699.7030	699.9030
12	1.75	-	699.5040*	-	-
14	1.5	699.3050*	-	699.7050	-

* Available OnDemand



Technical Data: Metric

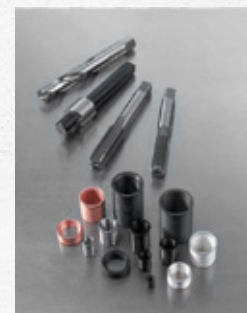
INSERT		DRILL		COUNTER BORE		TAP
Thread (mm)	Thread Pitch	Drill	Diameter	Min. Dia.	Min. Depth	Major Dia.
4	0.7	#19	0.166	0.226	0.075	0.194
5		#8	0.199	0.279		0.238
6	1.0	Drill	0.246	0.319		0.290
8	1.25	L	0.323	0.351	0.080	0.330
		P		0.419		0.369
		P		0.419		0.381
10	1.00	13/32	0.406	0.440	0.085	0.422
				0.466		0.349
				0.500		0.463
12	1.25	29/64	0.453	0.542		0.474
				0.552		0.503
				0.560		0.516
14	1.50	31/64	0.484	0.595	0.110	0.540
				0.605		0.552
				0.668		0.567
16	1.50	21/32	0.656	0.743	0.130	0.634
18	1.50	23/32	0.718	0.787	0.115	0.713
				0.837	0.125	0.741
						0.794

Metric Inserts

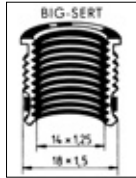
(Shaded areas indicate inserts supplied with the kit)

Size (mm)	Thread Pitch	Insert Length		Insert	Kit
		Inches	mm	Art. No.	Art. No.
4	0.7	.240	6.0	699.1098	699.1003
5	0.8	.300	7.6	699.1100	699.1002
		.400	10.0	699.1102	
6	1.0	.370	9.4	699.1104	699.1004
		.470	12.0	699.1106	
7		.550	14.0	699.1109*	-
		.460	11.7	699.1110	699.1006
8	1.25	.460	11.7	699.1112	699.1008
		.640	16.2	699.1114	
9		.510	13.0	699.1115	699.1019
		.710	18.0	699.11151*	
10	1.0	.360	9.0	699.1111	699.1009
		.600	15.0	699.1113	
	1.25	.550	14.0	699.1116	699.1010
		.650	16.2	699.1118	
		.800	20.0	699.1120	
	1.5	.550	14.0	699.1122	699.1012
		.800	20.0	699.1124	
		.960	24.5	699.1126	
11	1.5	.630	16.0	699.1127*	
		.870	22.0	699.1128	699.1013
		1.18	30.0	699.11285	
12	1.25	.600	15.0	699.1129	699.1015
	1.5	.360	9.0	699.1130	
		.650	16.2	699.1131	699.1014
		.950	24.0	699.1132	
	1.75	.640	16.2	699.1134	699.1016
		.950	24.0	699.1136	
14	1.5	.260	6.6	699.1137	
		.370	9.4	699.1138	
		.500	12.7	699.1139	699.1018
		.700	17.8	699.11392	
		1.100	28.0	699.11393	
				699.11396	699.10185
16	1.5	.500	12.7	699.11396	699.10185
	2	.945	24	699.1401	-
18	1.5	.720	18.3	-	699.10187

* Available OnDemand



BIG-SERT® – Spark Plug Thread Repair



+ To be used if repair with TIME-SERT® is no longer possible. Threads which have been previously repaired or cut too big can be renewed with the BIG-SERT® insert.

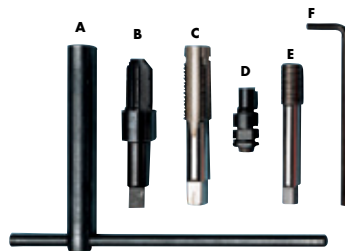
The BIG-SERT® insert comprises a 4-fold torque lock out. The BIG-SERT® external thread is M18 x 1.5, the internal thread M 14 x 1.25. Maximum diameter for repair should be 16.3 mm or .640" respectively.

The lower portion of the threads comprise grooves for 4 metal pins. When inserting the insert these pins are pressed outwards into the base material. The locking effect of these pins guarantees 100 % safety against torque-out of the insert.

BIG-SERT®

Spark Plug Repair Kit, M14 x 1.25

Art. No. 699.1700



KIT TOOLS

- A** Wrench with T-Bar
- B** Reamer
- C** Tap
- D** Locating Tap
- E** Insertion Tool
- F** Socket Head Wrench

+ Note: BIG-SERT® Spark Plug Repair Kit (**Art. No. 699.1700**) does not include inserts and must be ordered separately.

TIME-SERT® – Spark Plug Kits & Inserts



CONTENTS

- 1 Step Tool
- 1 Wrench
- 1 Seat Cutter
- 1 Insert Driver



Washer Seat Insert



Taper Seat Insert

+ Note: Inserts must be ordered separately

Size	Thread Pitch	Washer Seat Inserts			Taper Seat Insert			Kit Art. No.
		Insert Length	Insert	Insert	Insert Length	Insert	Insert	
		mm	Inches	Art. No.	mm	Inches	Art. No.	
10	1.0	9.0	0.360	699.1180*	-	-	-	699.1144
12		9.0		699.1182*	-	-	-	
		15.0	0.600	699.1184*	-	-	-	
		7.0	0.270	699.1186*	-	-	-	
		8.0	0.320	699.1188*	-	-	-	
14	1.25	9.4	0.370	699.1190	-	-	-	
		11.0	0.430	699.1192	-	-	-	
		15.0		699.1194	15.7	0.620	699.1199	
		16.8	0.600	699.1196	-	-	-	

* Available OnDemand

Spark Plug

Insert		Drill		Counterbore		Tap
Insert (mm)	Thread Pitch	Drill	Diameter	Min Dia.	Min. Depth.	Major Dia.
10	1.0	Y	0.0404	0.461	0.067	0.445
12		3/64	0.484	0.484	0.073	0.540
14	1.25	9/16	0.562	0.562	0.073	0.619

Master Sets

Art. No. 964.9617 • 70 pcs.



THREADS SIZES

M5 / M6 / M8 / M10 / M12

- Metric coarse thread
- Inserts and tools for 5 sizes with 2 different lengths of inserts

Thread Ø x pitch x length, mm

M5 x 0.8 x 7.6	M8 x 1.25 x 16.2
M5 x 0.8 x 10.0	M10 x 1.5 x 14.0
M6 x 1.0 x 9.4	M10 x 1.5 x 20.0
M6 x 1.0 x 12.0	M12 x 1.75 x 16.2
M8 x 1.25 x 11.7	M12 x 1.75 x 24.0

Art. No. 699.0100 • 100 pcs.



THREAD SIZES

1/4-20, 5/16-18, 3/8-16, 7/16-14, 1/2-13

- Inch coarse thread
- Each kit includes 5 complete tool kits with 20 inserts per kit (10 long and 10 short) for a total of 100 inserts

OEM TIME-SERT® Thread Repair Kits

Art. No. 699.5553



FORD Triton Spark Plug Kit

INSERT SIZE: M14 x 1.25 x 16.8 mm

REPLACEMENT INSERTS

Art. No. 699.1800

CONTAINS

1 wrench, 1 reamer, 1 tap, 1 driver, 1 setting tool, 1 hex key 3/16, 1 hex key 1/8, 1 sealer, 5 Triton inserts.

- 1.9/3.8/4.6/5.4/6.8 litre 2 valve or 4 valve heads

+ Note: Not recommended for holes larger than 0.660" or 16.8 mm

Art. No. 699.2200



TOYOTA Head Bolt Repair Kit

INSERT SIZE: M11 x 1.50 x 30mm

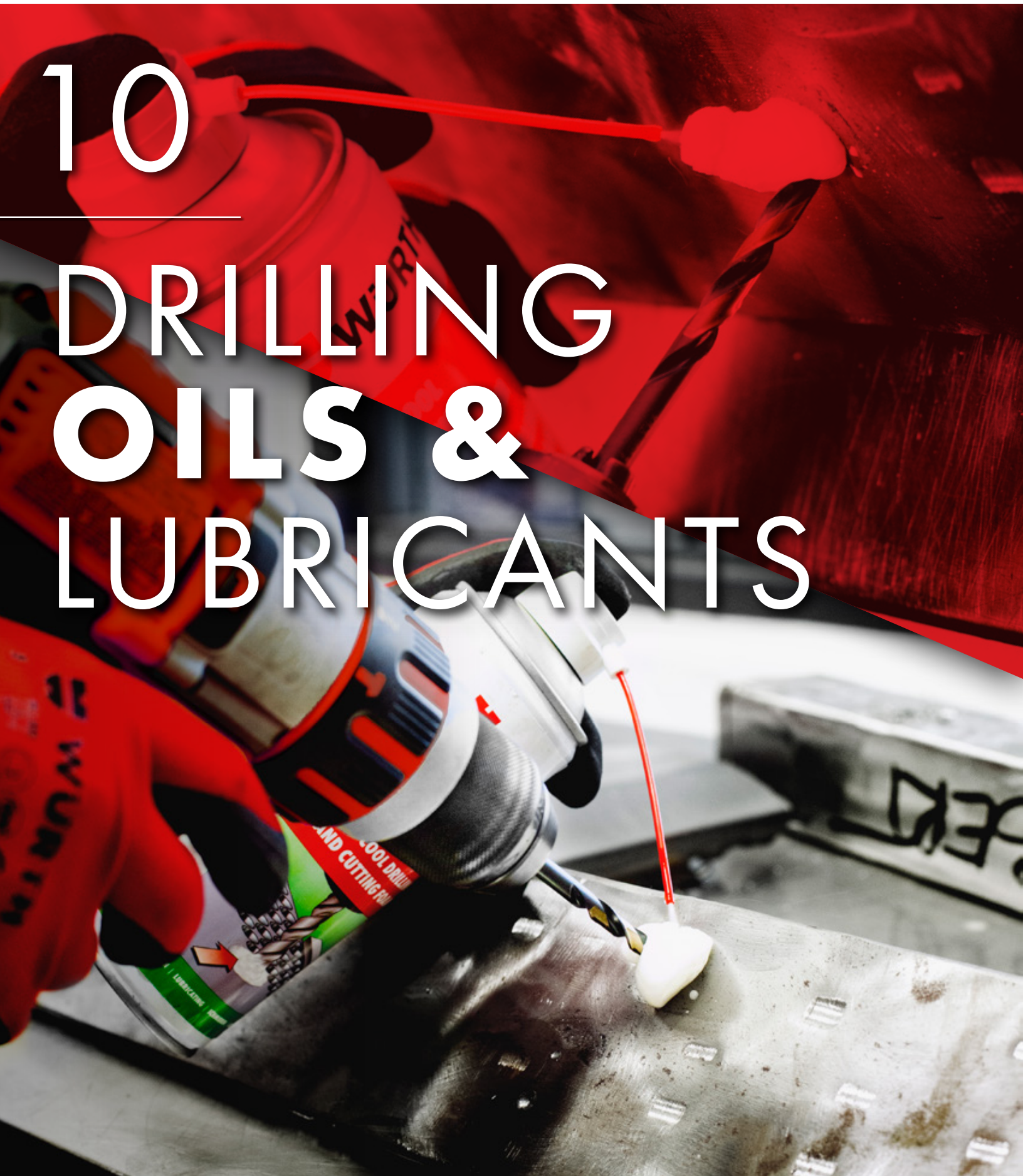
REPLACEMENT INSERTS

Art. No. 699.11285

- Universal head bolt repair for Toyota
- Coredrill - 7 1/2" OAL
- Tap - 6" OAL
- Driver - 6" OAL

10

DRILLING OILS & LUBRICANTS



CUT + COOL Cooling Lubricant Concentrate

Art. No. 893.050030 5 L

+ **Partly synthetic all-purpose lubricant with an outstanding cooling effect and excellent chip removal.**

FEATURES

- Low-foaming tendency makes it ideal to be used with soft-water
- Excellent corrosion protection for tools and workpieces
- Excellent lubricating capacities allowing for increased operating speeds and less friction

AREAS OF APPLICATION

- Light-to-medium weight steel, cast iron, aluminum alloys and non-ferrous metal chips
- All lathes, grinders, and machining center equipment

Usage	Dilution Ratio
Grinding of steels and non-ferrous metals	4 - 6%
Machining of steels and non-ferrous metals	6 - 10%
Refractometer factor:	2.3

+ **Note:** Boron-free, amine-free, chlorine-free, and formaldehyde-free



CUT + COOL Eco Cutting and Drilling Oil

Art. No. 893.050012 5 L

+ **A biodegradable, ecologically-sound cutting oil with uncompromising performance.**

FEATURES

- Odour-free
- Free of chlorine, sulphur, phosphor, silicone, resin and mineral oil
- Free of Paint-Wetting Impairment Substances (PWIS)
- Non-conductive

BENEFITS

- Easy to use
- No cleaning of metals prior to assembly or further treatment required (e.g. welding) with low use concentrations
- Can be used on delicate surfaces, such as marble, plastic, and electrical components
- Minimal smoking

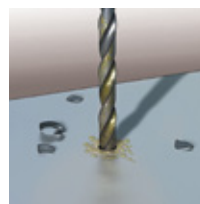
AREAS OF APPLICATION

For local use and with loss lubrication systems. Optimum use with flat pressing between workpiece and tool, as well as for all difficult machining work.

ORDINARY OIL



CUTTING OIL ECO



Due to adherence of oil particles on machining tool, an optimum, long-term lubricating action is achieved.



CUT + COOL Cutting and Drilling Oil

1
Art. No. 893.050004 • 287 g

- + Multi-functional cutting oil used in a variety of applications for light, medium, or heavy machine work.**

FEATURES

- Aerosol container
- Universal use
- Free of silicone, chlorine, resin and acid
- Free of Paint Wetting Impairment Substances (PWIS)
- Spray cools on contact
- Protects tools
- Good creeping properties
- Excellent corrosion protection
- Dissolves sticky residues & deposits

- Good material compatibility

BENEFITS

- Creeps into tight spaces
- Prevents welding of small material particles to cutting edge
- Provides lasting protection against further formation of rust and corrosion
- No re-treatment or preservation necessary
- Gumming up of chips is prevented

AREAS OF APPLICATION

For drilling, thread tapping, thread forming, turning, counter-sinking, reaming and sawing. Optimal for stainless steel, but also high-alloy & construction steel, non-ferrous and precious metals. Can be used as a preservative agent for semi-finished and finished parts, machine parts, and as gun oil.

CUT + COOL Cutting and Drilling Oil Perfect

2
Art. No. 893.050008 • 334 g

- + High-performance cutting oil for heavy-duty machining and high cutting speeds.**

FEATURES

- Aerosol container
- Free of chlorine, sulphur, phosphor, silicone and resin
- Free of Paint Wetting Impairment Substances (PWIS)
- Dual use as a lubricant and paste for heavy-duty machining
- Great corrosion protection
- Extremely resistant to high pressure

BENEFITS

- Horizontal and overhead applications can be executed with ease
- Provides excellent results and safety for all materials and applications
- Can be welded without cleaning when smaller quantities are used
- Extends the life of tools
- Easy machining of hard steels with maximum strength

AREAS OF APPLICATION

Optimum use for all machining of all materials such as steel, high-alloy steel, aluminum, non-ferrous metals, titanium, hard metals, cast iron, etc.

CUT + COOL Cutting and Drilling Foam

3
Art. No. 893.050007 • 386 g

- + Highly activated high-performance cutting foam for all machining applications.**

FEATURES

- Suitable for overhead working. Results in a well-adhering oil foam on the work piece
- No de-greasing work with cleaners necessary. Can be washed off with clean water
- Very good cooling effect, strongly adhesive. Low consumption; can be used as a minimal-quantity lubricant
- High performance thanks to high cutting speed and minimal tool wear
- Sulfur, mineral oil, heavy metal, and resin free
- Does not contain volatile chlorinated hydrocarbons
- Free of substances which interfere with wetting of paint

AREAS OF USE

- For all ferrous and non-ferrous metals
- Steel: alloy and non-alloy
- All casting types: cast steel, malleable cast iron, die casting etc.
- Copper and its alloys: cast brass, red brass etc.
- All chrome-nickel alloys
- Aluminum and aluminum alloys

APPLICATIONS

Well-suited toward all machining applications, such as: thread cutting, thread drilling, centering, stripping, reaming, drilling and milling.



TECHNICAL INFORMATION

PRODUCT	Cutting and Drilling Oil	Cutting and Drilling Oil Perfect	Eco Cutting and Drilling Oil	Cooling Lubricant Concentrate
ART. NO.	893.050004	893.050008	893.050012	893.050030
CONTAINER	Aerosol, 400 mL	Aerosol, 400 mL	Canister, 5 L	Canister, 5 L
TYPE	Multi-functional oil for many applications	High-pressure resistant high-performance cutting oil for excellent results with all materials	Biodegradable, harmless cutting oil	Universal cooling lubricant with high corrosion protection
PROPERTIES	<p>For universal use</p> <p>Extremely good creep capacity</p> <p>Already cools while spraying on</p> <p>Dissolves sticky residues and deposits</p> <p>Good material compatibility</p> <p>Gumming up of chips is prevented</p>	<p>Can be used as minimal quantity lubricant</p> <p>High separating effect between friction partners workpiece and tool</p> <p>Outstanding results for all machining work</p> <p>Very good high pressure resistance</p> <p>Weldable without prior cleaning (with low use concentrations)</p> <p>Top dimensional accuracy and quality</p>	<p>Can be used in areas in which food is processed or stored</p> <p>Suitable for loss lubrication</p> <p>No reaction on contact with sensitive materials</p> <p>Very good high-pressure resistance</p> <p>Outstanding corrosion protection</p> <p>Further processing (e.g. welding) possible without washing off (with low use concentrations)</p> <p>100% biodegradable</p> <p>Odour-free</p>	<p>Multi-functionally suitable for all machining equipment</p> <p>Suitable for a broad range of materials</p> <p>Free from mandatory warning symbols</p> <p>High corrosion protection</p> <p>Extremely hypoallergenic</p> <p>Low-foaming</p> <p>No gumming up of measuring sensors, etc.</p>
BASE	Mineral Oil	Mineral oil with synth. ester	Synth. ester	Mineral oil
COLOUR	Brown-yellow	Yellow	Light yellow	Brown (concent.); Semi-transparent emulsion
FLASH POINT (OIL)	~ 190 °C (374 °F)	~ 170 °C (338 °F)	~ 275 °C (527 °F)	-
VISCOSITY, MM²/SEC	12	25	35	66
DENSITY AT 20 °C, G/CM³	0.889	0.835	0.77	0.989
WATER HAZARD CLASS	1	1	1	1
PH VALUE	-	-	-	8.9 (emulsion)
REFRACTIVE INDEX	-	-	-	-
LOADABILITY, WEAR PROTECTION, SERVICE LIFE*	-	-	-	26 mm ² (steel ¹)
	-	-	-	25 mm ² (steel ²)
	-	-	-	20 mm ² (aluminum ³)
BRUGGER TEST, N/MM² (DIN 51347)	22	113	22	-
SHELF LIFE, MONTHS	12 (+5 to +40 °C) (+41 to 104 °F)	12 (-10 to +50 °C) (+14 to +122 °F)	12 (-10 to +60 °C) (+14 to +140 °F)	12 (+5 to +40 °C) (+41 to +104 °F)

APPLICATION TABLE

	Cutting and Drilling Oil	Cutting and Drilling Oil Perfect	Cutting and Drilling Oil	Cooling Lubricant Concentrate
MATERIALS	893.050004	893.050008	893.050012	893.050030
STEEL, ALLOYED STEEL	• •	• • •	• • •	• •
HIGH-ALLOY STEEL	• •	• • •	• • •	• •
CAST IRON, GREY CAST IRON	• •	• • •	• •	• •
CARBIDE	• •	• • •	• •	•
NON-FERROUS METAL (COPPER, BRASS, ETC.)	• •	• • •	• • •	•
TITANIUM	•	• • •	• •	•
MAGNESIUM	•	• • •	• •	•
ALUMINUM, ALUMINUM ALLOYS	•	• • •	• •	• •
MACHINING PROCESSES				
TURNING, AUTOMATIC LATHE	• •	• • •	•	• •
DRILLING, COUNTERSINKING, REAMING	• •	• • •	• • •	• •
DEEP DRILLING	•	• • •	• •	•
SAWING	• •	• • •	• •	• •
THREAD TAPPING	• •	• • •	• • •	• •
THREAD FORMING, ROLLING	• •	• • •	• • •	•
MILLING	•	• • •	• •	• •
GRINDING	•	• • •	•	• •
FORMING, ROLLING, BENDING	•	• • •	• • •	•
PUNCHING, FINE PUNCHING	•	• •	• •	•
BROACHING, TOOTH CUTTING	•	• • •	• •	•
CHARACTERISTICS				
BASIS	Mineral oil	Mineral oil with synth. ester	Synth. ester	Mineral oil
VISCOSITY (MM²/S)	12	25	35	175
MINIMAL QUANTITY LUBRICATION		✓	✓	
FREE FROM MANDATORY WARNING SYMBOLS			✓	✓
SUITABLE FOR OVERHEAD APPLICATIONS				
BIODEGRADABLE/APPR. FOR USE IN FOOD PROS. & STORAGE			✓	
VERY HIGH LUBRICATING PERFORMANCE		✓	✓	
VERY LONG TOOL LIFE		✓	✓	✓
MINIMAL SMOKING		✓	✓	✓
EXTREMELY LOW CONSUMPTION			✓	
GOOD CREEP PROPERTIES	✓			
LOW-FOAMING				✓
VERY HIGH MICROBIAL STABILITY				✓
WATER HAZARD CLASS	1	1	1	2

TAP & DRILL CHART – CONVERSION TABLES

METRIC AND IMPERIAL

UNC Unified National Coarse

Size (inch)	Thread per inch	Recommended drill size
1	64	53
2	56	50
3	48	47
4	40	$\frac{3}{32}$
5	40	38
6	32	36
8	32	29
10	24	25
12	24	16
$\frac{1}{4}$	20	$\frac{13}{64}$
$\frac{5}{16}$	18	$\frac{17}{64}$
$\frac{3}{8}$	16	$\frac{5}{16}$
$\frac{7}{16}$	14	$\frac{3}{8}$
$\frac{1}{2}$	13	$\frac{27}{64}$
$\frac{9}{16}$	12	$\frac{31}{64}$
$\frac{5}{8}$	11	$\frac{35}{64}$
$\frac{3}{4}$	10	$\frac{21}{32}$
$\frac{7}{8}$	9	$\frac{49}{64}$
1	8	$\frac{7}{8}$
$1 \frac{1}{8}$	7	$\frac{63}{64}$
$1 \frac{1}{4}$	7	$1 \frac{7}{64}$
$1 \frac{3}{8}$	6	$1 \frac{7}{32}$
$1 \frac{1}{2}$	6	$1 \frac{11}{32}$
$1 \frac{3}{4}$	5	$1 \frac{9}{16}$
2	$4 \frac{1}{2}$	$1 \frac{25}{32}$

UNC Unified National Coarse

Size (inch)	Thread per inch	Recommended drill size
0	80	$\frac{3}{64}$
1	72	53
2	64	50
3	56	45
4	48	42
5	44	37
6	40	33
8	36	$\frac{9}{64}$
10	32	21
12	26	14
$\frac{1}{4}$	28	$\frac{7}{32}$
$\frac{5}{16}$	24	$\frac{17}{64}$
$\frac{3}{8}$	24	Q
$\frac{7}{16}$	20	$\frac{25}{64}$
$\frac{1}{2}$	20	$\frac{20}{64}$
$\frac{9}{16}$	18	$\frac{33}{64}$
$\frac{5}{8}$	18	$\frac{37}{64}$
$\frac{3}{4}$	16	$\frac{11}{16}$
$\frac{7}{8}$	14	$\frac{13}{16}$
1	12	$\frac{59}{64}$
1	14*	$\frac{15}{16}$
$1 \frac{1}{8}$	12	$1 \frac{3}{64}$
$1 \frac{1}{4}$	12	$1 \frac{11}{64}$
$1 \frac{3}{8}$	12	$1 \frac{19}{64}$
$1 \frac{1}{2}$	12	$1 \frac{27}{64}$

Metric ISO Coarse

Size (mm)	Thread pitch	Recommended drill size
1.6	0.35	$\frac{3}{64}$
1.7	0.35	55
1.8	0	54
2	0.40	$\frac{1}{10}$
2.5	0.45	40
3	0.5	40
3.5	0.60	33
4	0.70	30
4.5	0.75	27
5	0.80	$\frac{11}{64}$
6	1.0	$\frac{13}{64}$
7	1.0	6.0
8	1.25	H
9	1.25	$\frac{5}{16}$
10	1.5	$\frac{11}{32}$
11	1.5	$\frac{3}{8}$
12	1.75	$\frac{13}{32}$
14	2.0	$\frac{31}{64}$
16	2.0	$\frac{9}{16}$
18	2.5	$\frac{39}{64}$
20	2.5	$\frac{45}{64}$
22	2.5	$\frac{25}{32}$
24	3.0	$\frac{53}{64}$
27	3.0	$\frac{61}{64}$
30	3.5	$1 \frac{3}{64}$
33	3.5	$1 \frac{11}{64}$
36	4.0	$1 \frac{1}{4}$
39	4.0	$1 \frac{3}{8}$

Metric Iso Coarse

Size (mm)	Thread pitch	Recommended drill size
4	0.35	$\frac{3}{64}$
5	0.35	55
6	0	54
7	0.40	$\frac{1}{10}$
8	0.45	40
10	0.5	40
10	0.60	33
12	0.70	30
12	0.75	27
12	0.80	$\frac{11}{64}$
14	1.0	$\frac{13}{64}$
16	1.0	6.0
18	1.25	H
18	1.25	$\frac{5}{16}$
20	1.5	$\frac{11}{32}$
20	1.5	$\frac{3}{8}$
22	1.75	$\frac{13}{32}$
22	2.0	$\frac{31}{64}$
24	2.0	$\frac{9}{16}$
24	2.5	$\frac{39}{64}$

CONVERSION TABLE

INCH TO MILLIMETRE EQUIVALENTS

To convert to millimetres, multiply inches by 25.4

INCHES		mm
Fract.	Decimals	
	0.00004	0.001
	0.00039	0.01
	0.00079	0.02
	0.001	0.025
	0.00118	0.03
	0.00157	0.04
	0.00197	0.05
	0.002	0.051
	0.00236	0.06
	0.00276	0.07
	0.003	0.0762
	0.00315	0.08
	0.00354	0.09
	0.00394	0.1
	0.004	0.1016
	0.005	0.1270
	0.006	0.1524
	0.007	0.1778
	0.00787	0.2
	0.008	0.2032
	0.009	0.2286
	0.00984	0.25
	0.01	0.254
	0.01181	0.3
1/64	0.01563	0.3969
	0.01575	0.4
	0.01969	0.5
	0.02	0.508
	0.02362	0.6
	0.025	0.635
	0.02756	0.7
	0.0295	0.75
	0.03	0.762
1/32	0.03125	0.7938
	0.0315	0.8
	0.03543	0.9
	0.03937	1.0
	0.04	1.016
3/64	0.04687	1.191
	0.04724	1.2
	0.05	1.27
	0.05512	1.4
	0.05906	1.5
	0.06	1.524
1/16	0.06250	1.5875
	0.06299	1.6
	0.06693	1.7
	0.07	1.778
	0.07087	1.8
	0.075	1.905
5/64	0.07813	1.9844
	0.07874	2
	0.08	2.032
	0.08661	2.2
	0.09	2.286
	0.09055	2.3
3/32	0.09375	2.3812
	0.09843	2.5
	0.1	2.54
	0.10236	2.6
7/64	0.10937	2.7781
	0.11811	3
1/8	0.1250	3.175

INCHES		mm
Fract.	Decimals	
	0.13780	3.5
9/64	0.14063	3.5719
	0.150	3.810
5/32	0.15625	3.9688
	0.15748	4
11/64	0.17188	4.3656
	0.1750	4.445
	0.17717	4.5
3/16	0.18750	4.7625
	0.19685	5
	0.20	5.08
13/64	0.2013	5.1594
	0.21654	5.5
7/32	0.21875	5.5562
	0.2250	5.715
15/64	0.23438	5.9531
	0.23622	6
1/4	0.250	6.35
	0.25591	6.5
17/64	0.26563	6.7469
	0.275	6.985
	0.27559	7
9/32	0.28125	7.1438
	0.29528	7.5
19/64	0.29688	7.5406
	0.30	7.62
5/16	0.3125	7.9375
	0.31496	8
21/64	0.32813	8.3344
	0.33465	8.5
11/32	0.34375	8.7312
	0.350	8.89
	0.35433	9
23/64	0.35938	9.1281
	0.37402	9.5
3/8	0.375	9.525
25/64	0.39063	9.9219
	0.39370	10
	0.400	10.16
13/32	0.40625	10.3188
	0.41359	10.5
27/64	0.42188	10.7156
	0.43307	11
7/16	0.43750	11.1125
	0.450	11.430
	0.45276	11.5
29/64	0.45313	11.5094
15/32	0.46875	11.9062
	0.47244	12
31/64	0.48438	12.3031
	0.49213	12.5
1/2	0.50	12.7
	0.51181	13
33/64	0.51563	13.0969
17/32	0.53125	13.4938
	0.53150	13.5
35/64	0.54688	13.8906
	0.550	13.970
	0.55118	14
9/16	0.56250	14.2875
	0.5708	14.5
	0.57813	14.6844
	0.59055	15

To convert to inches, divide millimetres by 25.4

INCHES		mm
Fract.	Decimals	
19/32	0.59375	15.0812
	0.600	15.24
39/64	0.60938	15.4781
	0.61024	15.5
5/8	0.6250	15.875
	0.62992	16
41/64	0.64063	16.2719
	0.64961	16.5
	0.650	16.51
21/32	0.65625	16.6688
	0.66929	17
43/64	0.67188	17.0656
11/16	0.68750	17.4625
	0.68898	17.5
	0.700	17.78
45/64	0.70313	17.8594
	0.70866	18
23/32	0.71875	18.2562
	0.72835	18.5
47/64	0.73438	18.6531
	0.74803	19
3/4	0.750	19.050
49/64	0.76563	19.4469
	0.76772	19.5
25/32	0.78125	19.8438
	0.78740	20
51/64	0.79688	20.2406
	0.800	20.320
	0.80709	20.5
13/16	0.81250	20.6375
	0.82677	21
53/64	0.82813	21.0344
27/32	0.84375	21.4312
	0.84646	21.5
	0.850	21.590
55/64	0.85938	21.8281
	0.86614	22
7/8	0.875	22.225
	0.88583	22.5
57/64	0.89063	22.6219
	0.900	22.860
	0.90551	23
29/32	0.90625	23.0188
59/64	0.92188	23.4156
	0.92520	23.5
15/16	0.93750	23.8125
	0.94488	24
	0.950	24.130
61/64	0.95313	24.2094
	0.96457	24.5
31/32	0.96875	24.6062
	0.98425	25
63/64	0.98438	25.0031
1	1.00000	25.4
	1.06299	27
	1.10240	28
	1.18110	30
1 1/4	1.250	31.75
	1.29921	33
	1.3780	35
	1.41732	36
1 1/2	1.500	38.1
	1.53543	39

INCHES		mm
Fract.	Decimals	
	1.57480	40
	1.65354	42
1 3/4	1.750	44.45
	1.7170	45
	1.88976	48
	1.96850	50
2	2.000	50.8
	2.04724	52
	2.16540	55
	2.20472	56
	2.250	57.15
	2.36220	60
2 1/2	2.500	63.5
	2.51968	64
2 3/4	2.750	69.85
	2.83464	72
	2.95280	75
3	3.000	76.2
	3.14960	80
3 1/2	3.500	88.9
	3.54330	90
	3.9370	100
4	4.000	101.6
	4.33070	110
4 1/2	4.500	114.3
	4.72440	120
5	5.000	127
	5.51180	140
	5.90550	150
6	6.000	152.4
	6.29920	160
	7.08660	180
	7.8740	200
8	8.000	203.2
	8.66140	220
	9.44880	240
	9.84250	250
10	10.000	254
	10.23620	260
	11.02360	280
	11.8110	300
1 Foot	12.000	304.8
	12.59840	320
	13.38580	340
	13.77950	350
	14.17320	360
	14.96060	380
	15.7480	400
16	16.000	406.4
	17.71650	450
	19.6850	500
20	20.000	508
	23.6220	60
2 Feet	24.000	609.6
3 Feet	36.000	914.4
	39.370	1 meter
4 Feet	48.000	1,219
5 Feet	60.000	1,524
6 Feet	72.000	1,828
	78.740	2 meters
8 Feet	96.000	2,438
	118.100	3 meters
	196.850	5 meters

CONVERSIONS EQUIVALENTS

FRACTION/DECIMAL/METRIC/EQUIVALENTS

FRACTION	DECIMAL	METRIC
1/64	0.0156	0.40
1/32	0.0312	0.79
3/64	0.0468	1.19
1/16	0.0625	1.59
5/64	0.0781	1.98
3/32	0.0937	2.38
7/64	0.1093	2.78
1/8	0.1250	3.18
9/64	0.1406	3.57
5/32	0.1562	3.97
11/64	0.1718	4.36
3/16	0.1875	4.76
13/64	0.2031	5.16
7/32	0.2187	5.55
15/64	0.2343	5.95
1/4	0.2500	6.35
9/32	0.2656	6.75
19/64	0.2812	7.14
5/16	0.2968	7.54
21/64	0.3125	7.94
11/32	0.3281	8.33
23/64	0.3437	8.73
3/8	0.3593	9.13
25/64	0.3750	9.53
13/32	0.3906	9.92
27/64	0.4062	10.32
7/16	0.4218	10.71
29/64	0.4375	11.11
15/32	0.4531	11.51
31/64	0.4687	11.90
1/2	0.4843	12.30
33/64	0.5156	13.10

FRACTION/DECIMAL/METRIC/EQUIVALENTS

FRACTION	DECIMAL	METRIC
17/32	0.5312	13.49
35/64	0.5468	13.89
9/16	0.5625	14.29
37/64	0.5781	14.68
19/32	0.5937	15.08
39/64	0.6093	15.48
5/8	0.6250	15.88
41/64	0.6406	16.27
21/32	0.6562	16.67
43/64	0.6718	17.06
11/16	0.6875	17.46
45/64	0.7031	17.86
23/32	0.7187	18.25
47/64	0.7343	18.65
3/4	0.7500	19.05
49/64	0.7656	19.45
25/32	0.7812	19.84
51/64	0.7968	20.24
13/16	0.8125	20.64
53/64	0.8281	21.03
27/32	0.8437	21.43
55/64	0.8593	21.83
7/8	0.8750	22.23
57/64	0.8906	22.62
29/32	0.9062	23.02
5/64	0.9218	23.41
15/16	0.9375	23.81
61/64	0.9531	24.21
31/32	0.9687	24.60
63/64	0.9843	25.00
1	1.0000	25.40

INCH to METRIC

1 inch = 25.400 millimetres
 1 foot = 0.3048 metres
 1 mile = 1.609 kilometers

SQ INCH to METRIC

1 sq. inch = 6.4516 sq. centimetres
 1 sq. foot = .0929 sq. metres

CU. INCH to METRIC

1 cu. inch = 16.387 cu. centimetres

IMPERIAL to METRIC

1 fluid ounce = 28.413 millilitres
 1 gallon = 4.546 litres

IMPERIAL to METRIC

1 ounce = 28.35 grams
 1 pound = .4536 kilograms

POUNDS/INCHES to METRIC

1 pound per square inch = .0703 kilogram per square centimetre
 1 pound per square inch = .0703 atmosphere (metric)

FAHRENHEIT to CELSIUS

(°F minus 32°) x .556 = °Celsius

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

