तीक्ष्ण

Shining your Future

SHINING TOOLS LIMITED

An ISO 9001:2015 Certified Company

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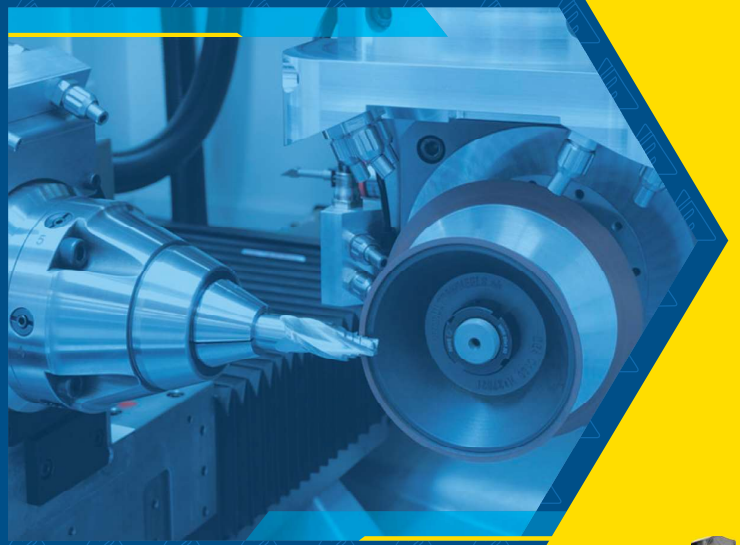

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Solid Carbide Cutting Tools Technology

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THE COMPANY

Company Profile

Shining Tools Ltd. is an established name in the business of Design & Manufacturing of Solid Carbide cutting tool solutions for Endmill, Drill, Reamer etc. and its Re-conditioning Services. We are pioneer in development of Customized tools for special purpose application using Modern CAD/CAM software packages and technical team of trained professional. Promoted in the year 1998 by visionary entrepreneurs with extensive experience in the field of tool engineering The company and its brand name tixna® are synonyms of uncompromising quality. tixna® has the privilege of being a self-certified supplier to leading automobile, engineering, aerospace & defense companies. The Company has a completely integrated unit with state-of-the art manufacturing facilities for every critical operation. We have been more than just a cutting tool provider. We develop and supply the technologies, processes and support our customers to maximize their productivity and profitability by fulfilling our commitment on or before time.

Welcome to the Future

Business Ethics is a key part of our core values

Since our inception, we have always been the trusted business partner in providing quality tooling solutions to achieve higher productivity.

Pioneer in development of Standard & Customized tools for special purpose application using Modern CAD/CAM software packages

One stop solution for Regrinding and recoating with original geometries and coatings.

Quality is monitored using non-contact optical CNC measuring machine to avoid human error.

Long tradition of meeting the highest demands of customers by fulfilling our commitment on time.

Aerospace

Medical

Power & Energy

Automotive

Mould & Die

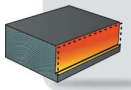
Casting & Foundry

General Engineering

MILLING APPLICATION

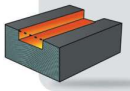
Your milling application and your material to help find the proper tool for your application.

Profiling or Finishing :



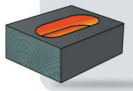
Use 4/5 Flutes

Slotting :



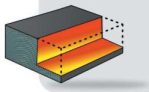
Use 3 Flute to resist chatter.
Use 2 Flute or roughing mill for maximum chip removal.

Plunge / Slot :



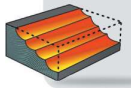
Use 3 Flutes to resist chatter.
Use 2 Flutes for maximum chip removal.

Profiling / Roughing Cut :



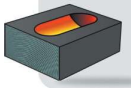
Use roughing mill for rapid material removal.

Contour Finishing :



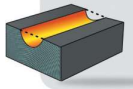
Use 3/4 Flutes Ball End

Plunge / Slot Contouring :



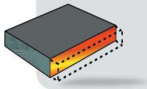
Use 2 Flutes Ball End for maximum chip removal.
use 3 flute Ball End for improved surface finish.

Contour Slotting :



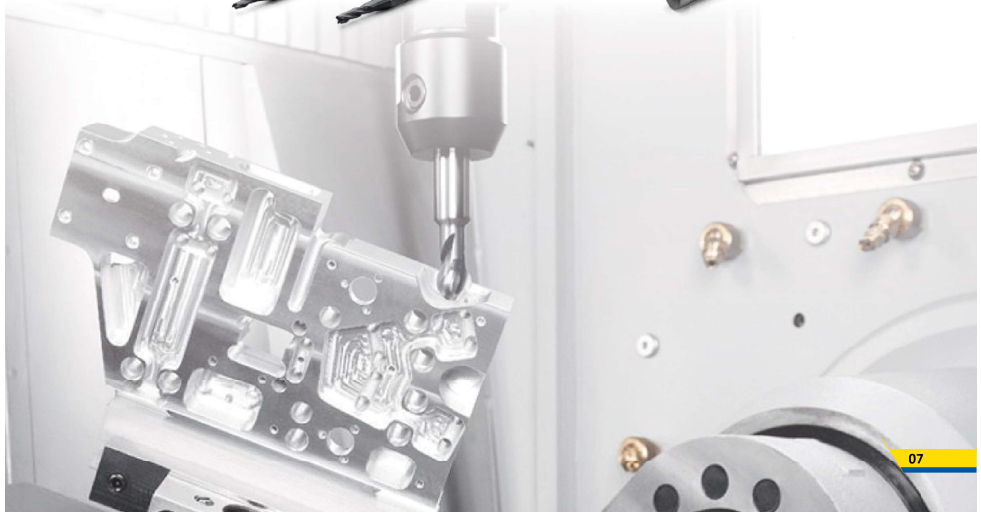
Use 3 Flutes Ball End to resist chatter.
Use 2 Flutes Ball End for maximum chip removal.

Profiling / Thine Material :

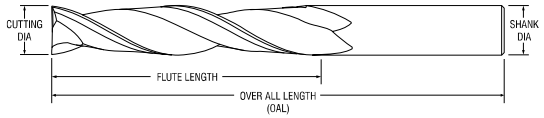


Use 2/4 straight flutes.

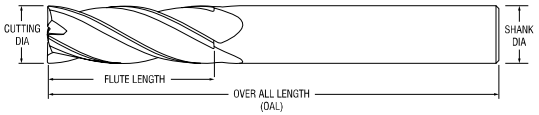
ENDMILL



2 FLUTE ENDMILL



4 FLUTE ENDMILL



2 FLUTE ENDMILL (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR2 030 R	3	3	10	39
ESR2 040 R	4	4	14	51
ESR2 050 R	5	5	16	51
ESR2 060 R	6	6	19	63
ESR2 080 R	8	8	22	63
ESR2 100 R	10	10	25	70
ESR2 120 R	12	12	25	75
ESR2 140 R	14	14	30	80
ESR2 160 R	16	16	32	80
ESR2 180 R	18	18	35	101
ESR2 200 R	20	20	38	101

4 FLUTE ENDMILL (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR4 030 R	3	3	10	39
ESR4 040 R	4	4	14	51
ESR4 050 R	5	5	16	51
ESR4 060 R	6	6	19	63
ESR4 080 R	8	8	22	63
ESR4 100 R	10	10	25	70
ESR4 120 R	12	12	25	75
ESR4 140 R	14	14	30	80
ESR4 160 R	16	16	32	80
ESR4 180 R	18	18	35	101
ESR4 200 R	20	20	38	101

2 FLUTE ENDMILL (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESL2 030 L	3	3	19	57
ESL2 040 L	4	4	19	57
ESL2 050 L	5	5	25	63
ESL2 060 L	6	6	28	76
ESL2 080 L	8	8	29	76
ESL2 100 L	10	10	32	76
ESL2 120 L	12	12	51	101
ESL2 140 L	14	14	55	125
ESL2 160 L	16	16	55	125
ESL2 180 L	18	18	55	125
ESL2 200 L	20	20	55	125

4 FLUTE ENDMILL (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESL4 030 L	3	3	19	57
ESL4 040 L	4	4	19	57
ESL4 050 L	5	5	25	63
ESL4 060 L	6	6	28	76
ESL4 080 L	8	8	29	76
ESL4 100 L	10	10	32	76
ESL4 120 L	12	12	51	101
ESL4 140 L	14	14	55	125
ESL4 160 L	16	16	55	125
ESL4 180 L	18	18	55	125
ESL4 200 L	20	20	55	125

2 FLUTE ENDMILL (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESX2 030 XL	3	3	25	75
ESX2 040 XL	4	4	25	75
ESX2 050 XL	5	5	28	75
ESX2 060 XL	6	6	38	101
ESX2 080 XL	8	8	40	101
ESX2 100 XL	10	10	45	101
ESX2 120 XL	12	12	60	150
ESX2 140 XL	14	14	75	150
ESX2 160 XL	16	16	75	150
ESX2 180 XL	18	18	75	150
ESX2 200 XL	20	20	75	150

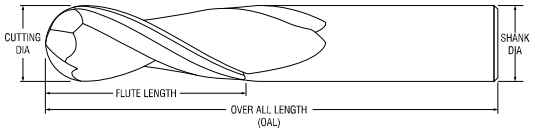
4 FLUTE ENDMILL (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESX4 030 XL	3	3	25	75
ESX4 040 XL	4	4	25	75
ESX4 050 XL	5	5	28	75
ESX4 060 XL	6	6	38	101
ESX4 080 XL	8	8	40	101
ESX4 100 XL	10	10	45	101
ESX4 120 XL	12	12	60	150
ESX4 140 XL	14	14	75	150
ESX4 160 XL	16	16	75	150
ESX4 180 XL	18	18	75	150
ESX4 200 XL	20	20	75	150

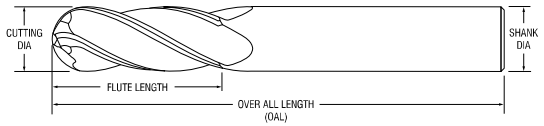
***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

BALLNOSE

2 FLUTE BALLNOSE



4 FLUTE BALLNOSE



2 FLUTE BALLNOSE (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBR2 030 R	3	3	10	39
EBR2 040 R	4	4	14	51
EBR2 050 R	5	5	16	51
EBR2 060 R	6	6	19	63
EBR2 080 R	8	8	22	63
EBR2 100 R	10	10	25	70
EBR2 120 R	12	12	25	76
EBR2 140 R	14	14	30	80
EBR2 160 R	16	16	32	80
EBR2 180 R	18	18	35	101
EBR2 200 R	20	20	38	101

4 FLUTE BALLNOSE (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBR4 030 R	3	3	10	39
EBR4 040 R	4	4	14	51
EBR4 050 R	5	5	16	51
EBR4 060 R	6	6	19	63
EBR4 080 R	8	8	22	63
EBR4 100 R	10	10	25	70
EBR4 120 R	12	12	25	76
EBR4 140 R	14	14	30	80
EBR4 160 R	16	16	32	80
EBR4 180 R	18	18	35	101
EBR4 200 R	20	20	38	101

2 FLUTE BALLNOSE (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBL2 030 L	3	3	19	57
EBL2 040 L	4	4	19	57
EBL2 050 L	5	5	25	63
EBL2 060 L	6	6	28	76
EBL2 080 L	8	8	29	76
EBL2 100 L	10	10	32	76
EBL2 120 L	12	12	51	101
EBL2 140 L	14	14	55	125
EBL2 160 L	16	16	55	125
EBL2 180 L	18	18	55	125
EBL2 200 L	20	20	55	125

4 FLUTE BALLNOSE (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBL4 030 L	3	3	19	57
EBL4 040 L	4	4	19	57
EBL4 050 L	5	5	25	63
EBL4 060 L	6	6	28	76
EBL4 080 L	8	8	29	76
EBL4 100 L	10	10	32	76
EBL4 120 L	12	12	51	101
EBL4 140 L	14	14	55	125
EBL4 160 L	16	16	55	125
EBL4 180 L	18	18	55	125
EBL4 200 L	20	20	55	125

2 FLUTE BALLNOSE (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBX2 030 XL	3	3	25	75
EBX2 040 XL	4	4	25	75
EBX2 050 XL	5	5	28	75
EBX2 060 XL	6	6	38	101
EBX2 080 XL	8	8	40	101
EBX2 100 XL	10	10	45	101
EBX2 120 XL	12	12	60	150
EBX2 140 XL	14	14	75	150
EBX2 160 XL	16	16	75	150
EBX2 180 XL	18	18	75	150
EBX2 200 XL	20	20	75	150

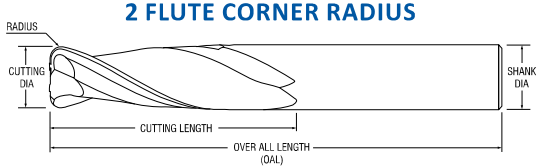
4 FLUTE BALLNOSE (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBX4 030 XL	3	3	25	75
EBX4 040 XL	4	4	25	75
EBX4 050 XL	5	5	28	75
EBX4 060 XL	6	6	38	101
EBX4 080 XL	8	8	40	101
EBX4 100 XL	10	10	45	101
EBX4 120 XL	12	12	60	150
EBX4 140 XL	14	14	75	150
EBX4 160 XL	16	16	75	150
EBX4 180 XL	18	18	75	150
EBX4 200 XL	20	20	75	150

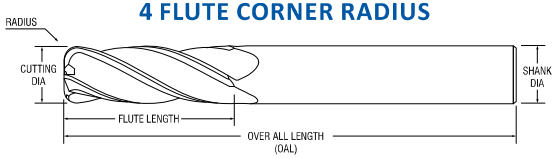
***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

CORNER RADIUS ENDMILL

2 FLUTE CORNER RADIUS



4 FLUTE CORNER RADIUS



2 FLUTE CORNER RADIUS

ITEM CODE	MILL DIA	SHANK DIA	RADIUS	FLUTE	OAL
ECR2 030 R0.5	3	3	0.5	10	39
ECR2 030 R1	3	3	1	10	39
ECR2 040 R0.5	4	4	0.5	14	51
ECR2 040 R1	4	4	1	14	51
ECR2 050 R0.5	5	5	0.5	16	51
ECR2 050 R1	5	5	1	16	51
ECR2 060 R0.5	6	6	0.5	19	63
ECR2 060 R1	6	6	1	19	63
ECR2 060 R1.5	6	6	1.5	19	63
ECR2 080 R0.5	8	8	0.5	22	63
ECR2 080 R1	8	8	1	22	63
ECR2 080 R2	8	8	2	22	63
ECR2 100 R0.5	10	10	0.5	25	70
ECR2 100 R1	10	10	1	25	70
ECR2 100 R2	10	10	2	25	70
ECR2 100 R2.5	10	10	2.5	25	70
ECR2 120 R0.5	12	12	0.5	25	75
ECR2 120 R1	12	12	1	25	75
ECR2 120 R2	12	12	2	25	75
ECR2 120 R3	12	12	3	25	75
ECR2 160 R1	16	16	1	32	80
ECR2 160 R2	16	16	2	32	80
ECR2 160 R3	16	16	3	32	80
ECR2 160 R4	16	16	4	32	80
ECR2 200 R1	20	20	1	38	101
ECR2 200 R2	20	20	2	38	101
ECR2 200 R3	20	20	3	38	101
ECR2 200 R4	20	20	4	38	101

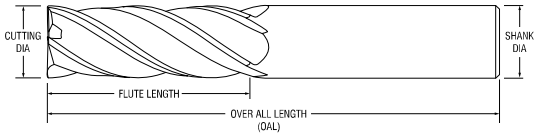
4 FLUTE CORNER RADIUS

ITEM CODE	MILL DIA	SHANK DIA	RADIUS	FLUTE	OAL
ECR4 030 R0.5	3	3	0.5	10	39
ECR4 030 R1	3	3	1	10	39
ECR4 040 R0.5	4	4	0.5	14	51
ECR4 040 R1	4	4	1	14	51
ECR4 050 R0.5	5	5	0.5	16	51
ECR4 050 R1	5	5	1	16	51
ECR4 060 R0.5	6	6	0.5	19	63
ECR4 060 R1	6	6	1	19	63
ECR4 060 R1.5	6	6	1.5	19	63
ECR4 080 R0.5	8	8	0.5	22	63
ECR4 080 R1	8	8	1	22	63
ECR4 080 R2	8	8	2	22	63
ECR4 100 R0.5	10	10	0.5	25	70
ECR4 100 R1	10	10	1	25	70
ECR4 100 R2	10	10	2	25	70
ECR4 100 R2.5	10	10	2.5	25	70
ECR4 120 R0.5	12	12	0.5	25	75
ECR4 120 R1	12	12	1	25	75
ECR4 120 R2	12	12	2	25	75
ECR4 120 R3	12	12	3	25	75
ECR4 160 R1	16	16	1	32	80
ECR4 160 R2	16	16	2	32	80
ECR4 160 R3	16	16	3	32	80
ECR4 160 R4	16	16	4	32	80
ECR4 200 R1	20	20	1	38	101
ECR4 200 R2	20	20	2	38	101
ECR4 200 R3	20	20	3	38	101
ECR4 200 R4	20	20	4	38	101

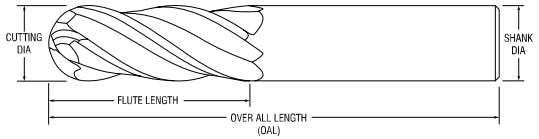
***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

UTP

UTP ENDMILL



UTP BALLNOSE



UTP ENDMILL

4 FLUTE UTP SQUARE ENDMILL (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR4 030 UTP	3	3	10	39
ESR4 040 UTP	4	4	14	51
ESR4 050 UTP	5	5	16	51
ESR4 060 UTP	6	6	19	63
ESR4 080 UTP	8	8	22	63
ESR4 100 UTP	10	10	25	70
ESR4 120 UTP	12	12	25	75
ESR4 140 UTP	14	14	30	80
ESR4 160 UTP	16	16	32	80
ESR4 180 UTP	18	18	35	101
ESR4 200 UTP	20	20	38	101

4 FLUTE UTP SQUARE ENDMILL (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESL4 030 UTP	3	3	19	57
ESL4 040 UTP	4	4	19	57
ESL4 050 UTP	5	5	25	63
ESL4 060 UTP	6	6	28	76
ESL4 080 UTP	8	8	29	76
ESL4 100 UTP	10	10	32	76
ESL4 120 UTP	12	12	51	101
ESL4 140 UTP	14	14	55	125
ESL4 160 UTP	16	16	55	125
ESL4 180 UTP	18	18	55	125
ESL4 200 UTP	20	20	55	125

4 FLUTE UTP SQUARE ENDMILL (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESX4 030 UTP	3	3	25	75
ESX4 040 UTP	4	4	25	75
ESX4 050 UTP	5	5	28	75
ESX4 060 UTP	6	6	38	101
ESX4 080 UTP	8	8	40	101
ESX4 100 UTP	10	10	45	101
ESX4 120 UTP	12	12	60	150
ESX4 140 UTP	14	14	75	150
ESX4 160 UTP	16	16	75	150
ESX4 180 UTP	18	18	75	150
ESX4 200 UTP	20	20	75	150

UTP BALLNOSE

4 FLUTE UTP BALLNOSE (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBR4 030 UTP	3	3	10	39
EBR4 040 UTP	4	4	14	51
EBR4 050 UTP	5	5	16	51
EBR4 060 UTP	6	6	19	63
EBR4 080 UTP	8	8	22	63
EBR4 100 UTP	10	10	25	70
EBR4 120 UTP	12	12	25	75
EBR4 140 UTP	14	14	30	80
EBR4 160 UTP	16	16	32	80
EBR4 180 UTP	18	18	35	101
EBR4 200 UTP	20	20	38	101

4 FLUTE UTP BALLNOSE (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBL4 030 UTP	3	3	19	57
EBL4 040 UTP	4	4	19	57
EBL4 050 UTP	5	5	25	63
EBL4 060 UTP	6	6	28	76
EBL4 080 UTP	8	8	29	76
EBL4 100 UTP	10	10	32	76
EBL4 120 UTP	12	12	51	101
EBL4 140 UTP	14	14	55	125
EBL4 160 UTP	16	16	55	125
EBL4 180 UTP	18	18	55	125
EBL4 200 UTP	20	20	55	125

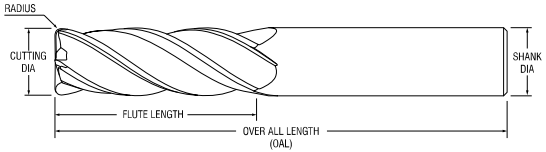
4 FLUTE UTP BALLNOSE (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBX4 030 UTP	3	3	25	75
EBX4 040 UTP	4	4	25	75
EBX4 050 UTP	5	5	28	75
EBX4 060 UTP	6	6	38	101
EBX4 080 UTP	8	8	40	101
EBX4 100 UTP	10	10	45	101
EBX4 120 UTP	12	12	60	150
EBX4 140 UTP	14	14	75	150
EBX4 160 UTP	16	16	75	150
EBX4 180 UTP	18	18	75	150
EBX4 200 UTP	20	20	75	150

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

UTP CORNER RADIUS

UTP CORNER RADIUS



4 FLUTE UTP CORNER RADIUS (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECR4 030 UTP R1	3	3	10	39	1
ECR4 040 UTP R1	4	4	14	51	1
ECR4 050 UTP R1	5	5	16	51	1
ECR4 060 UTP R1	6	6	19	63	1
ECR4 080 UTP R1	8	8	22	63	1
ECR4 100 UTP R1	10	10	25	70	1
ECR4 120 UTP R1	12	12	25	75	1
ECR4 140 UTP R1	14	14	30	80	1
ECR4 160 UTP R1	16	16	32	80	1
ECR4 180 UTP R1	18	18	35	101	1
ECR4 200 UTP R1	20	20	38	101	1

4 FLUTE UTP CORNER RADIUS (Regular)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECR4 030 UTP R0.5	3	3	10	39	0.5
ECR4 040 UTP R0.5	4	4	14	51	0.5
ECR4 050 UTP R0.5	5	5	16	51	0.5
ECR4 060 UTP R0.5	6	6	19	63	0.5
ECR4 080 UTP R0.5	8	8	22	63	0.5
ECR4 100 UTP R0.5	10	10	25	70	0.5
ECR4 120 UTP R0.5	12	12	25	75	0.5
ECR4 140 UTP R0.5	14	14	30	80	0.5
ECR4 160 UTP R0.5	16	16	32	80	0.5
ECR4 180 UTP R0.5	18	18	35	101	0.5
ECR4 200 UTP R0.5	20	20	38	101	0.5

4 FLUTE UTP CORNER RADIUS (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECL4 030 UTP R1	3	3	19	57	1
ECL4 040 UTP R1	4	4	19	57	1
ECL4 050 UTP R1	5	5	25	63	1
ECL4 060 UTP R1	6	6	28	76	1
ECL4 080 UTP R1	8	8	29	76	1
ECL4 100 UTP R1	10	10	32	76	1
ECL4 120 UTP R1	12	12	51	101	1
ECL4 140 UTP R1	14	14	55	125	1
ECL4 160 UTP R1	16	16	55	125	1
ECL4 180 UTP R1	18	18	55	125	1
ECL4 200 UTP R1	20	20	55	125	1

4 FLUTE UTP CORNER RADIUS (Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECL4 030 UTP R0.5	3	3	19	57	0.5
ECL4 040 UTP R0.5	4	4	19	57	0.5
ECL4 050 UTP R0.5	5	5	25	63	0.5
ECL4 060 UTP R0.5	6	6	28	76	0.5
ECL4 080 UTP R0.5	8	8	29	76	0.5
ECL4 100 UTP R0.5	10	10	32	76	0.5
ECL4 120 UTP R0.5	12	12	51	101	0.5
ECL4 140 UTP R0.5	14	14	55	125	0.5
ECL4 160 UTP R0.5	16	16	55	125	0.5
ECL4 180 UTP R0.5	18	18	55	125	0.5
ECL4 200 UTP R0.5	20	20	55	125	0.5

4 FLUTE UTP CORNER RADIUS (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECX4 030 UTP R1	3	3	25	75	1
ECX4 040 UTP R1	4	4	25	75	1
ECX4 050 UTP R1	5	5	28	75	1
ECX4 060 UTP R1	6	6	38	101	1
ECX4 080 UTP R1	8	8	40	101	1
ECX4 100 UTP R1	10	10	45	101	1
ECX4 120 UTP R1	12	12	60	150	1
ECX4 140 UTP R1	14	14	75	150	1
ECX4 160 UTP R1	16	16	75	150	1
ECX4 180 UTP R1	18	18	75	150	1
ECX4 200 UTP R1	20	20	75	150	1

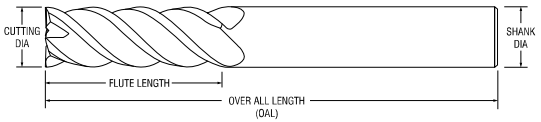
4 FLUTE UTP CORNER RADIUS (Ex. Long)

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL	RADIUS
ECX4 030 UTP R0.5	3	3	25	75	0.5
ECX4 040 UTP R0.5	4	4	25	75	0.5
ECX4 050 UTP R0.5	5	5	28	75	0.5
ECX4 060 UTP R0.5	6	6	38	101	0.5
ECX4 080 UTP R0.5	8	8	40	101	0.5
ECX4 100 UTP R0.5	10	10	45	101	0.5
ECX4 120 UTP R0.5	12	12	60	150	0.5
ECX4 140 UTP R0.5	14	14	75	150	0.5
ECX4 160 UTP R0.5	16	16	75	150	0.5
ECX4 180 UTP R0.5	18	18	75	150	0.5
ECX4 200 UTP R0.5	20	20	75	150	0.5

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

XF & XP ENDMILL

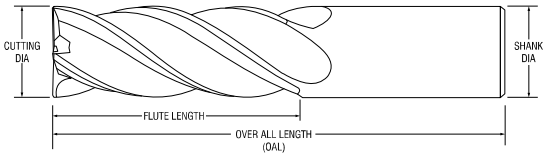
XF ENDMILL



XF ENDMILL

4 FLUTE SQUARE ENDMILL XF				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR4 030 XF	3	3	10	39
ESR4 040 XF	4	4	14	51
ESR4 050 XF	5	5	16	51
ESR4 060 XF	6	6	19	63
ESR4 080 XF	8	8	22	63
ESR4 100 XF	10	10	25	70
ESR4 120 XF	12	12	25	75
ESR4 140 XF	14	14	30	80
ESR4 160 XF	16	16	32	80
ESR4 180 XF	18	18	35	101
ESR4 200 XF	20	20	38	101

XP ENDMILL



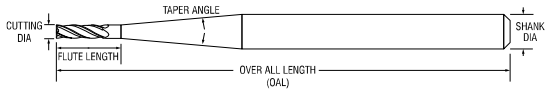
XP ENDMILL

4 FLUTE SQUARE ENDMILL XP				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR4 030 XP	3	3	10	39
ESR4 040 XP	4	4	14	51
ESR4 050 XP	5	5	16	51
ESR4 060 XP	6	6	19	63
ESR4 080 XP	8	8	22	63
ESR4 100 XP	10	10	25	70
ESR4 120 XP	12	12	25	75
ESR4 140 XP	14	14	30	80
ESR4 160 XP	16	16	32	80
ESR4 180 XP	18	18	35	101
ESR4 200 XP	20	20	38	101

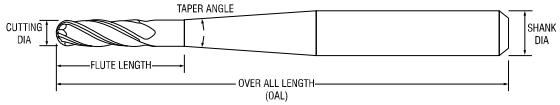
***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

TAPER NECK SERIES

4 FLUTE TAPER NECK ENDMILL



4 FLUTE TAPER NECK BALLNOSE



TAPER NECK ENDMILL

2 FLUTE TAPER NECK SQUARE ENDMILL

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESTN2 020 TN	2	4	6	50
ESTN2 030 TN	3	6	10	63
ESTN2 040 TN	4	6	12	63
ESTN2 050 TN	5	6	14	76
ESTN2 060 TN	6	8	14	76
ESTN2 080 TN	8	10	16	100
ESTN2 100 TN	10	12	20	100

4 FLUTE TAPER NECK SQUARE ENDMILL

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESTN4 020 TN	2	4	6	50
ESTN4 020 TN	3	6	10	63
ESTN4 020 TN	4	6	12	63
ESTN4 020 TN	5	6	14	76
ESTN4 020 TN	6	8	14	76
ESTN4 020 TN	8	10	16	100
ESTN4 020 TN	10	12	20	100

TAPER NECK BALLNOSE

2 FLUTE TAPER NECK BALLNOSE

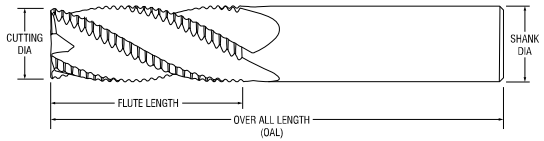
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBTN2 020 TN	2	4	4	50
EBTN2 030 TN	3	6	6	63
EBTN2 040 TN	4	6	8	63
EBTN2 050 TN	5	6	10	76
EBTN2 060 TN	6	8	12	76
EBTN2 080 TN	8	10	14	100
EBTN2 100 TN	10	12	18	100

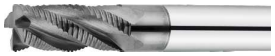
4 FLUTE TAPER NECK BALLNOSE

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
EBTN4 020 TN	2	4	4	50
EBTN4 020 TN	3	6	6	63
EBTN4 020 TN	4	6	8	63
EBTN4 020 TN	5	6	10	76
EBTN4 020 TN	6	8	12	76
EBTN4 020 TN	8	10	14	100
EBTN4 020 TN	10	12	18	100

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

4 FLUTE ROUGHER SQUARE ENDMILL

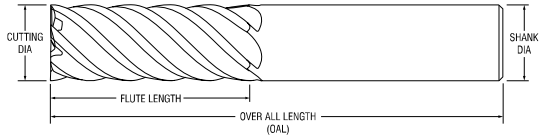




4 FLUTE ROUGHER SQUARE ENDMILL

ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
RSE4 050 R	5	5	16	51
RSE4 060 R	6	6	19	63
RSE4 080 R	8	8	22	63
RSE4 100 R	10	10	25	70
RSE4 120 R	12	12	25	75
RSE4 140 R	14	14	30	80
RSE4 160 R	16	16	32	80
RSE4 180 R	18	18	35	101
RSE4 200 R	20	20	38	101

6 FLUTE SQUARE ENDMILL

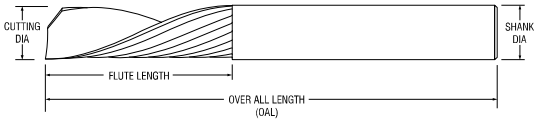


6 FLUTE SQUARE ENDMILL

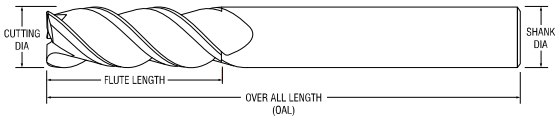
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR6 060 R	6	6	19	63
ESR6 080 R	8	8	22	63
ESR6 100 R	10	10	25	70
ESR6 120 R	12	12	25	75
ESR6 160 R	16	16	32	80
ESR6 200 R	20	20	38	101

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

SINGLE LIP CUTTER



3 FLUTE SQUARE ENDMILL



SINGLE LIP

SINGLE LIP CUTTER				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
SL1 0306 L	3	6	6	63
SL1 0406 L	4	6	6	63
SL1 0506 L	5	6	8	63
SL1 0606 L	6	6	10	76
SL1 0706 L	7	6	10	76
SL1 0906 L	9	8	12	76
SL1 1110 R	11	10	14	76
SL1 1110 L	11	10	14	101
SL1 1312 R	13	12	16	76
SL1 1312 L	13	12	16	101
SL1 1514 R	15	14	18	76
SL1 1514 L	15	14	18	101
SL1 1716 R	17	16	20	75
SL1 1716 L	17	16	20	101

3 FLUTE SQUARE ENDMILL

3 FLUTE SQUARE ENDMILL				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
ESR3 030 R	3	6	10	51
ESR3 040 R	4	6	14	51
ESR3 050 R	5	6	16	51
ESR3 060 R	6	6	19	51
ESR3 080 R	8	8	22	63
ESR3 100 R	10	10	30	70
ESR3 120 R	12	12	32	75
ESR3 140 R	14	14	30	80
ESR3 160 R	16	16	32	80
ESR3 180 R	18	18	35	101
ESR3 200 R	20	20	38	101

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

Profile Projector

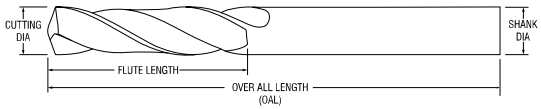
High Resolutions
non contact
Inspection

CNC measuring facilities

smarTcheck
the universal measuring
machine for tool inspection

DRILL

DRILL 3XD



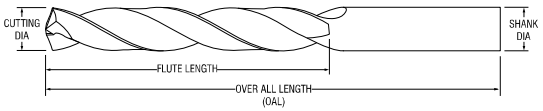
DRILL 3XD SERIES

DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 030 F	3	6	25	63
DL3 031 F	3.1	6	25	63
DL3 032 F	3.2	6	25	63
DL3 033 F	3.3	6	25	63
DL3 034 F	3.4	6	25	63
DL3 035 F	3.5	6	25	63
DL3 036 F	3.6	6	25	63
DL3 037 F	3.7	6	25	63
DL3 038 F	3.8	6	25	63
DL3 039 F	3.9	6	25	63
DL3 040 F	4	6	25	63
DL3 041 F	4.1	6	25	63
DL3 042 F	4.2	6	25	63
DL3 043 F	4.3	6	25	63
DL3 044 F	4.4	6	25	63
DL3 045 F	4.5	6	25	63
DL3 046 F	4.6	6	25	63
DL3 047 F	4.7	6	25	63
DL3 048 F	4.8	6	25	63
DL3 049 F	4.9	6	25	63
DL3 050 F	5	6	25	63
DL3 051 F	5.1	6	35	76
DL3 052 F	5.2	6	35	76
DL3 053 F	5.3	6	35	76
DL3 054 F	5.4	6	35	76
DL3 055 F	5.5	6	35	76
DL3 056 F	5.6	6	35	76
DL3 057 F	5.7	6	35	76
DL3 058 F	5.8	6	35	76
DL3 059 F	5.9	6	35	76
DL3 060 F	6	6	35	76
DL3 061 F	6.1	8	35	79
DL3 062 F	6.2	8	35	79
DL3 063 F	6.3	8	35	79
DL3 064 F	6.4	8	35	79
DL3 065 F	6.5	8	35	79
DL3 066 F	6.6	8	35	79
DL3 067 F	6.7	8	35	79
DL3 068 F	6.8	8	35	79
DL3 069 F	6.9	8	35	79
DL3 070 F	7	8	35	79
DL3 071 F	7.1	8	35	79
DL3 072 F	7.2	8	35	79
DL3 073 F	7.3	8	35	79
DL3 074 F	7.4	8	35	79

DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 075 F	7.5	8	35	79
DL3 076 F	7.6	8	35	79
DL3 077 F	7.7	8	35	79
DL3 078 F	7.8	8	35	79
DL3 079 F	7.9	8	35	79
DL3 080 F	8	8	35	79
DL3 081 F	8.1	10	45	89
DL3 082 F	8.2	10	45	89
DL3 083 F	8.3	10	45	89
DL3 084 F	8.4	10	45	89
DL3 085 F	8.5	10	45	89
DL3 086 F	8.6	10	45	89
DL3 087 F	8.7	10	45	89
DL3 088 F	8.8	10	45	89
DL3 089 F	8.9	10	45	89
DL3 090 F	9	10	45	89
DL3 095 F	9.5	10	45	89
DL3 098 F	9.8	10	45	89
DL3 100 F	10	10	45	89
DL3 102 F	10.2	12	55	101
DL3 104 F	10.4	12	55	101
DL3 105 F	10.5	12	55	101
DL3 108 F	10.8	12	55	101
DL3 110 F	11	12	55	101
DL3 115 F	11.5	12	55	101
DL3 118 F	11.8	12	55	101
DL3 120 F	12	12	55	101
DL3 125 F	12.5	14	60	110
DL3 128 F	12.8	14	60	110
DL3 130 F	13	14	60	110
DL3 135 F	13.5	14	60	110
DL3 140 F	14	14	60	110
DL3 145 F	14.5	16	65	115
DL3 150 F	15	16	65	115
DL3 153 F	15.3	16	65	115
DL3 155 F	15.5	16	65	115
DL3 160 F	16	16	65	115
DL3 165 F	16.5	18	73	123
DL3 170 F	17	18	73	123
DL3 175 F	17.5	18	73	123
DL3 180 F	18	18	73	123
DL3 185 F	18.5	20	79	131
DL3 190 F	19	20	79	131
DL3 195 F	19.5	20	79	131
DL3 200 F	20	20	79	131

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

DRILL 5XD



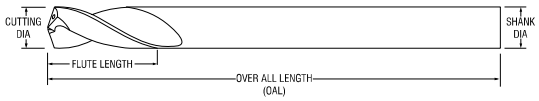
DRILL 5XD SERIES

DRILL - 5XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL5 030 F	3	6	35	74
DL5 031 F	3.1	6	35	74
DL5 032 F	3.2	6	35	74
DL5 033 F	3.3	6	35	74
DL5 034 F	3.4	6	35	74
DL5 035 F	3.5	6	35	74
DL5 036 F	3.6	6	35	74
DL5 037 F	3.7	6	35	74
DL5 038 F	3.8	6	35	74
DL5 039 F	3.9	6	35	74
DL5 040 F	4	6	35	74
DL5 041 F	4.1	6	40	80
DL5 042 F	4.2	6	40	80
DL5 043 F	4.3	6	40	80
DL5 044 F	4.4	6	40	80
DL5 045 F	4.5	6	40	80
DL5 046 F	4.6	6	40	80
DL5 047 F	4.7	6	40	80
DL5 048 F	4.8	6	40	80
DL5 049 F	4.9	6	40	80
DL5 050 F	5	6	40	80
DL5 051 F	5.1	6	45	82
DL5 052 F	5.2	6	45	82
DL5 053 F	5.3	6	45	82
DL5 054 F	5.4	6	45	82
DL5 055 F	5.5	6	45	82
DL5 056 F	5.6	6	45	82
DL5 057 F	5.7	6	45	82
DL5 058 F	5.8	6	45	82
DL5 059 F	5.9	6	45	82
DL5 060 F	6	6	45	82
DL5 061 F	6.1	8	50	91
DL5 062 F	6.2	8	50	91
DL5 063 F	6.3	8	50	91
DL5 064 F	6.4	8	50	91
DL5 065 F	6.5	8	50	91
DL5 066 F	6.6	8	50	91
DL5 067 F	6.7	8	50	91
DL5 068 F	6.8	8	50	91
DL5 069 F	6.9	8	50	91
DL5 070 F	7	8	50	91
DL5 071 F	7.1	8	50	91
DL5 072 F	7.2	8	50	91
DL5 073 F	7.3	8	50	91
DL5 074 F	7.4	8	50	91

DRILL - 5XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL5 075 F	7.5	8	50	91
DL5 076 F	7.6	8	50	91
DL5 077 F	7.7	8	50	91
DL5 078 F	7.8	8	50	91
DL5 079 F	7.9	8	50	91
DL5 080 F	8	8	50	91
DL5 081 F	8.1	10	55	103
DL5 082 F	8.2	10	55	103
DL5 083 F	8.3	10	55	103
DL5 084 F	8.4	10	55	103
DL5 085 F	8.5	10	55	103
DL5 086 F	8.6	10	55	103
DL5 087 F	8.7	10	55	103
DL5 088 F	8.8	10	55	103
DL5 089 F	8.9	10	55	103
DL5 090 F	9	10	55	103
DL5 095 F	9.5	10	55	103
DL5 098 F	9.8	10	55	103
DL5 100 F	10	10	55	103
DL5 102 F	10.2	12	75	120
DL5 104 F	10.4	12	75	120
DL5 105 F	10.5	12	75	120
DL5 108 F	10.8	12	75	120
DL5 110 F	11	12	75	120
DL5 115 F	11.5	12	75	120
DL5 118 F	11.8	12	75	120
DL5 120 F	12	12	75	120
DL5 125 F	12.5	14	80	125
DL5 128 F	12.8	14	80	125
DL5 130 F	13	14	80	125
DL5 135 F	13.5	14	80	125
DL5 140 F	14	14	80	125
DL5 145 F	14.5	16	85	135
DL5 150 F	15	16	85	135
DL5 153 F	15.3	16	85	135
DL5 155 F	15.5	16	85	135
DL5 160 F	16	16	85	135
DL5 165 F	16.5	18	93	143
DL5 170 F	17	18	93	143
DL5 175 F	17.5	18	93	143
DL5 180 F	18	18	93	143
DL5 185 F	18.5	20	101	153
DL5 190 F	19	20	101	153
DL5 195 F	19.5	20	101	153
DL5 200 F	20	20	101	153

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

THROUGH COOLANT DRILL 3XD



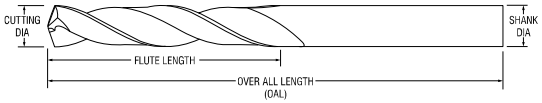
THROUGH COOLANT DRILL 3XD

THROUGH COOLANT DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 030 F	3	6	25	63
DL3 031 F	3.1	6	25	63
DL3 032 F	3.2	6	25	63
DL3 033 F	3.3	6	25	63
DL3 034 F	3.4	6	25	63
DL3 035 F	3.5	6	25	63
DL3 036 F	3.6	6	25	63
DL3 037 F	3.7	6	25	63
DL3 038 F	3.8	6	25	63
DL3 039 F	3.9	6	25	63
DL3 040 F	4	6	25	63
DL3 041 F	4.1	6	25	63
DL3 042 F	4.2	6	25	63
DL3 043 F	4.3	6	25	63
DL3 044 F	4.4	6	25	63
DL3 045 F	4.5	6	25	63
DL3 046 F	4.6	6	25	63
DL3 047 F	4.7	6	25	63
DL3 048 F	4.8	6	25	63
DL3 049 F	4.9	6	25	63
DL3 050 F	5	6	25	63
DL3 051 F	5.1	6	35	76
DL3 052 F	5.2	6	35	76
DL3 053 F	5.3	6	35	76
DL3 054 F	5.4	6	35	76
DL3 055 F	5.5	6	35	76
DL3 056 F	5.6	6	35	76
DL3 057 F	5.7	6	35	76
DL3 058 F	5.8	6	35	76
DL3 059 F	5.9	6	35	76
DL3 060 F	6	6	35	76
DL3 061 F	6.1	8	35	79
DL3 062 F	6.2	8	35	79
DL3 063 F	6.3	8	35	79
DL3 064 F	6.4	8	35	79
DL3 065 F	6.5	8	35	79
DL3 066 F	6.6	8	35	79
DL3 067 F	6.7	8	35	79
DL3 068 F	6.8	8	35	79
DL3 069 F	6.9	8	35	79
DL3 070 F	7	8	35	79
DL3 071 F	7.1	8	35	79
DL3 072 F	7.2	8	35	79
DL3 073 F	7.3	8	35	79
DL3 074 F	7.4	8	35	79

THROUGH COOLANT DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 075 F	7.5	8	35	79
DL3 076 F	7.6	8	35	79
DL3 077 F	7.7	8	35	79
DL3 078 F	7.8	8	35	79
DL3 079 F	7.9	8	35	79
DL3 080 F	8	8	35	79
DL3 081 F	8.1	10	45	89
DL3 082 F	8.2	10	45	89
DL3 083 F	8.3	10	45	89
DL3 084 F	8.4	10	45	89
DL3 085 F	8.5	10	45	89
DL3 086 F	8.6	10	45	89
DL3 087 F	8.7	10	45	89
DL3 088 F	8.8	10	45	89
DL3 089 F	8.9	10	45	89
DL3 090 F	9	10	45	89
DL3 095 F	9.5	10	45	89
DL3 098 F	9.8	10	45	89
DL3 100 F	10	10	45	89
DL3 102 F	10.2	12	55	101
DL3 104 F	10.4	12	55	101
DL3 105 F	10.5	12	55	101
DL3 108 F	10.8	12	55	101
DL3 110 F	11	12	55	101
DL3 115 F	11.5	12	55	101
DL3 118 F	11.8	12	55	101
DL3 120 F	12	12	55	101
DL3 125 F	12.5	14	60	110
DL3 128 F	12.8	14	60	110
DL3 130 F	13	14	60	110
DL3 135 F	13.5	14	60	110
DL3 140 F	14	14	60	110
DL3 145 F	14.5	16	65	115
DL3 150 F	15	16	65	115
DL3 153 F	15.3	16	65	115
DL3 155 F	15.5	16	65	115
DL3 160 F	16	16	65	115
DL3 165 F	16.5	18	73	123
DL3 170 F	17	18	73	123
DL3 175 F	17.5	18	73	123
DL3 180 F	18	18	73	123
DL3 185 F	18.5	20	79	131
DL3 190 F	19	20	79	131
DL3 195 F	19.5	20	79	131
DL3 200 F	20	20	79	131

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

THROUGH COOLANT DRILL 5XD



THROUGH COOLANT DRILL 5XD

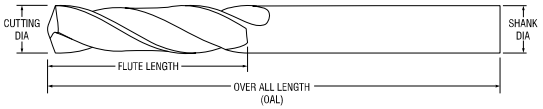
THROUGH COOLANT DRILL - 5XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL5 030 F	3	6	35	74
DL5 031 F	3.1	6	35	74
DL5 032 F	3.2	6	35	74
DL5 033 F	3.3	6	35	74
DL5 034 F	3.4	6	35	74
DL5 035 F	3.5	6	35	74
DL5 036 F	3.6	6	35	74
DL5 037 F	3.7	6	35	74
DL5 038 F	3.8	6	35	74
DL5 039 F	3.9	6	35	74
DL5 040 F	4	6	35	74
DL5 041 F	4.1	6	40	80
DL5 042 F	4.2	6	40	80
DL5 043 F	4.3	6	40	80
DL5 044 F	4.4	6	40	80
DL5 045 F	4.5	6	40	80
DL5 046 F	4.6	6	40	80
DL5 047 F	4.7	6	40	80
DL5 048 F	4.8	6	40	80
DL5 049 F	4.9	6	40	80
DL5 050 F	5	6	40	80
DL5 051 F	5.1	6	45	82
DL5 052 F	5.2	6	45	82
DL5 053 F	5.3	6	45	82
DL5 054 F	5.4	6	45	82
DL5 055 F	5.5	6	45	82
DL5 056 F	5.6	6	45	82
DL5 057 F	5.7	6	45	82
DL5 058 F	5.8	6	45	82
DL5 059 F	5.9	6	45	82
DL5 060 F	6	6	45	82
DL5 061 F	6.1	8	50	91
DL5 062 F	6.2	8	50	91
DL5 063 F	6.3	8	50	91
DL5 064 F	6.4	8	50	91
DL5 065 F	6.5	8	50	91
DL5 066 F	6.6	8	50	91
DL5 067 F	6.7	8	50	91
DL5 068 F	6.8	8	50	91
DL5 069 F	6.9	8	50	91
DL5 070 F	7	8	50	91
DL5 071 F	7.1	8	50	91
DL5 072 F	7.2	8	50	91
DL5 073 F	7.3	8	50	91
DL5 074 F	7.4	8	50	91

THROUGH COOLANT DRILL - 5XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL5 075 F	7.5	8	50	91
DL5 076 F	7.6	8	50	91
DL5 077 F	7.7	8	50	91
DL5 078 F	7.8	8	50	91
DL5 079 F	7.9	8	50	91
DL5 080 F	8	8	50	91
DL5 081 F	8.1	10	55	103
DL5 082 F	8.2	10	55	103
DL5 083 F	8.3	10	55	103
DL5 084 F	8.4	10	55	103
DL5 085 F	8.5	10	55	103
DL5 086 F	8.6	10	55	103
DL5 087 F	8.7	10	55	103
DL5 088 F	8.8	10	55	103
DL5 089 F	8.9	10	55	103
DL5 090 F	9	10	55	103
DL5 095 F	9.5	10	55	103
DL5 098 F	9.8	10	55	103
DL5 100 F	10	10	55	103
DL5 102 F	10.2	12	75	120
DL5 104 F	10.4	12	75	120
DL5 105 F	10.5	12	75	120
DL5 108 F	10.8	12	75	120
DL5 110 F	11	12	75	120
DL5 115 F	11.5	12	75	120
DL5 118 F	11.8	12	75	120
DL5 120 F	12	12	75	120
DL5 125 F	12.5	14	80	125
DL5 128 F	12.8	14	80	125
DL5 130 F	13	14	80	125
DL5 135 F	13.5	14	80	125
DL5 140 F	14	14	80	125
DL5 145 F	14.5	16	85	135
DL5 150 F	15	16	85	135
DL5 153 F	15.3	16	85	135
DL5 155 F	15.5	16	85	135
DL5 160 F	16	16	85	135
DL5 165 F	16.5	18	93	143
DL5 170 F	17	18	93	143
DL5 175 F	17.5	18	93	143
DL5 180 F	18	18	93	143
DL5 185 F	18.5	20	101	153
DL5 190 F	19	20	101	153
DL5 195 F	19.5	20	101	153
DL5 200 F	20	20	101	153

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

DRILL

XP DRILL - 3XD



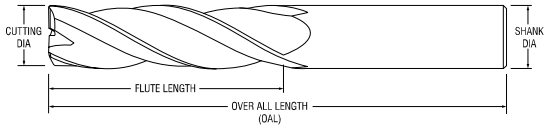
XP DRILL - 3XD

XP DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 030 XP	3	6	25	63
DL3 031 XP	3.1	6	25	63
DL3 032 XP	3.2	6	25	63
DL3 033 XP	3.3	6	25	63
DL3 034 XP	3.4	6	25	63
DL3 035 XP	3.5	6	25	63
DL3 036 XP	3.6	6	25	63
DL3 037 XP	3.7	6	25	63
DL3 038 XP	3.8	6	25	63
DL3 039 XP	3.9	6	25	63
DL3 040 XP	4	6	25	63
DL3 041 XP	4.1	6	25	63
DL3 042 XP	4.2	6	25	63
DL3 043 XP	4.3	6	25	63
DL3 044 XP	4.4	6	25	63
DL3 045 XP	4.5	6	25	63
DL3 046 XP	4.6	6	25	63
DL3 047 XP	4.7	6	25	63
DL3 048 XP	4.8	6	25	63
DL3 049 XP	4.9	6	25	63
DL3 050 XP	5	6	25	63
DL3 051 XP	5.1	6	35	76
DL3 052 XP	5.2	6	35	76
DL3 053 XP	5.3	6	35	76
DL3 054 XP	5.4	6	35	76
DL3 055 XP	5.5	6	35	76
DL3 056 XP	5.6	6	35	76
DL3 057 XP	5.7	6	35	76
DL3 058 XP	5.8	6	35	76
DL3 059 XP	5.9	6	35	76
DL3 060 XP	6	6	35	76
DL3 061 XP	6.1	8	35	79
DL3 062 XP	6.2	8	35	79
DL3 063 XP	6.3	8	35	79
DL3 064 XP	6.4	8	35	79
DL3 065 XP	6.5	8	35	79
DL3 066 XP	6.6	8	35	79
DL3 067 XP	6.7	8	35	79
DL3 068 XP	6.8	8	35	79
DL3 069 XP	6.9	8	35	79
DL3 070 XP	7	8	35	79
DL3 071 XP	7.1	8	35	79
DL3 072 XP	7.2	8	35	79
DL3 073 XP	7.3	8	35	79
DL3 074 XP	7.4	8	35	79

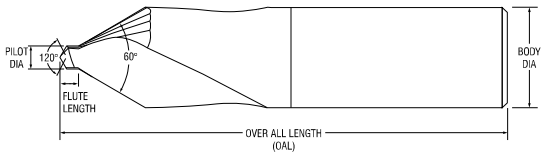
XP DRILL - 3XD				
ITEM CODE	DIA	SHANK	FLUTE	OAL
DL3 075 XP	7.5	8	35	79
DL3 076 XP	7.6	8	35	79
DL3 077 XP	7.7	8	35	79
DL3 078 XP	7.8	8	35	79
DL3 079 XP	7.9	8	35	79
DL3 080 XP	8	8	35	79
DL3 081 XP	8.1	10	45	89
DL3 082 XP	8.2	10	45	89
DL3 083 XP	8.3	10	45	89
DL3 084 XP	8.4	10	45	89
DL3 085 XP	8.5	10	45	89
DL3 086 XP	8.6	10	45	89
DL3 087 XP	8.7	10	45	89
DL3 088 XP	8.8	10	45	89
DL3 089 XP	8.9	10	45	89
DL3 090 XP	9	10	45	89
DL3 095 XP	9.5	10	45	89
DL3 098 XP	9.8	10	45	89
DL3 100 XP	10	10	45	89
DL3 102 XP	10.2	12	55	101
DL3 104 XP	10.4	12	55	101
DL3 105 XP	10.5	12	55	101
DL3 108 XP	10.8	12	55	101
DL3 110 XP	11	12	55	101
DL3 115 XP	11.5	12	55	101
DL3 118 XP	11.8	12	55	101
DL3 120 XP	12	12	55	101
DL3 125 XP	12.5	14	60	110
DL3 128 XP	12.8	14	60	110
DL3 130 XP	13	14	60	110
DL3 135 XP	13.5	14	60	110
DL3 140 XP	14	14	60	110
DL3 145 XP	14.5	16	65	115
DL3 150 XP	15	16	65	115
DL3 153 XP	15.3	16	65	115
DL3 155 XP	15.5	16	65	115
DL3 160 XP	16	16	65	115
DL3 165 XP	16.5	18	73	123
DL3 170 XP	17	18	73	123
DL3 175 XP	17.5	18	73	123
DL3 180 XP	18	18	73	123
DL3 185 XP	18.5	20	79	131
DL3 190 XP	19	20	79	131
DL3 195 XP	19.5	20	79	131
DL3 200 XP	20	20	79	131

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

HOLEMILL



CENTER DRILL



HOLEMILL

HOLEMILL			
ITEM CODE	MILL DIA	FLUTE	OAL
HM3 030 T	3	16	57
HM3 040 T	4	25	63
HM3 050 T	5	25	63
HM3 060 T	6	25	76
HM3 070 T	7	29	76
HM3 080 T	8	29	76
HM3 090 T	9	32	76
HM3 100 T	10	38	101
HM3 110 T	11	38	101
HM3 120 T	12	38	101
HM3 130 T	13	45	125
HM3 140 T	14	45	125
HM3 150 T	15	50	125
HM3 160 T	16	50	125

CENTER DRILL

CENTER DRILL METRIC				
ITEM CODE	PILOT DIA	BODY DIA	CEL	OAL
CD 100 315	1	3.15	1.6	32
CD 160 400	1.6	4	2.4	35
CD 200 500	2	5	2.9	40
CD 250 630	2.5	6.3	3.6	45
CD 315 800	3.15	8	4.4	50
CD 400 100	4	10	5.6	56
CD 500 125	5	12.5	6.9	63
CD 630 160	6.3	16	8.6	71
CD 800 200	8	20	10.1	80

CENTER DRILL INCH				
ITEM CODE	PILOT DIA	BODY DIA	CEL	OAL
CD 1/16 3/16	1/16	3/16	3/32	1 3/4
CD 3/32 1/4	3/32	1/4	5/32	2
CD 1/8 5/16	1/8	5/16	3/16	2 1/4
CD 3/16 7/16	3/16	7/16	9/32	2 1/2
CD 1/4 5/8	1/4	5/8	3/8	3

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

RE-CONDITION YOUR TOOLS GEOMETRIES TO ORIGINAL SPECIFICATIONS

RE-CONDITIONING SERVICES FOR

- ENDMILL
- BALLNOSE
- DRILLS
- CUSTOMIZED TOOLS

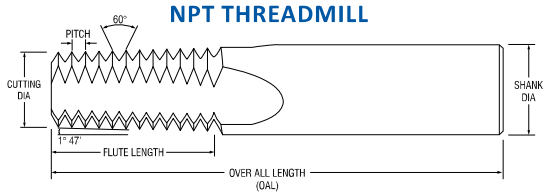
RE-GRINDING

We take pride in being pioneers in re-grinding carbide products.

When carbide Tools are Re-Sharpened, a new point is ground onto the end of the tool.

We take care to assure that the new point meets the original profile of the Tools. In case the life or the tool length becomes short, we re-grind to the next possible size required by the client.

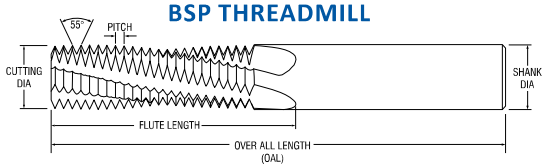
NPT THREADMILL



NPT

NPT THREADMILL								
	TPI	PITCH	CUTTING DIA	SHANK DIA	FLUTE	OAL	NO OF FLUTE	THREAD ANGLE
1/16" X 27	27	0.94	5.378	6	10	6	3	60°
1/8" X 27	27	0.94	7.378	8	10	63	3	60°
1/4" X 18	18	1.411	9.066	10	15	70	3	60°
3/8" X 18	18	1.411	11.066	12	15	75	4	60°
1/2", 3/4" X 14	14	1.814	14.134	16	30	80	4	60°
1" , 11/4", 1 1/2, 2" X 11.5	11.5	2.208	18.632	20	22	100	4	60°
2 1/2", 3"/8	8	3.175	18	20	32	100	4	60°

BSP THREADMILL

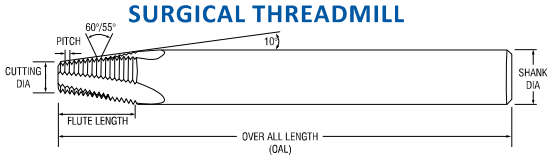


BSP

BSP THREADMILL								
	TPI	PITCH	CUTTING DIA	SHANK DIA	FLUTE	OAL	NO OF FLUTE	THREAD ANGLE
1/16" X 28, 1/8"	28	0.907	5.75	6	12	63	3	55°
1/8" X 28	28	0.907	7.8	8	20	63	3	55°
1/4" X 19, 3/8"	19	1.33	10.5	12	25	75	4	55°
3/8" X 19	19	1.33	13.5	14	30	80	4	55°
1/2", 3/4" X 14	14	1.81	15.75	16	35	80	5	55°
1".1 1/2", 2, 2 1/2" X 11	11	2.309	19.75	20	40	100	5	55°
5/16" X 22 BSF	22	1.154	5.75	6	18	63	3	55°

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

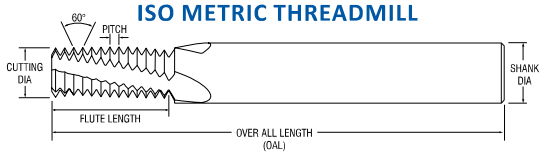
SURGICAL THREADMILL



SURGICAL

SURGICAL THREADMILL								
TAPER	CUTTING DIA	SHANK DIA	FLUTE	OAL	NO OF FLUTE	PITCH	THREAD ANGLE	HEIGHT
20°	3.2	6	8	63	3	0.4	60°	0.2
20°	2.9	6	9	63	3	0.5	60°	0.25
20°	1.5	6	4	63	3	0.3	55°	0.18
20°	2.5	6	10	63	3	0.4	55°	0.3
20°	2.9	6	9	63	3	0.5	55°	0.35
20°	3.8	6	6.5	63	3	0.6	55°	0.45

ISO METRIC THREADMILL



ISO METRIC

ISO METRIC THREADMILL							
ISO METRIC	PITCH	CUTTING DIA	SHANK DIA	FLUTE	OAL	NO OF FLUTE	THREAD ANGLE
M3 X 0.5	0.5	2.35	4	6	50	3	60°
M4 X 0.7	0.7	3.15	4	7	50	3	60°
M5 X 0.8	0.8	3.9	4	8	50	3	60°
M6 X 1.0	1	4.8	6	10	63	3	60°
M8 X 1.25	1.25	6.25	8	15	63	3	60°
M10 X 1.5	1.5	8.25	10	18	70	3	60°
M12 X 1.75	1.75	9.5	10	20	70	4	60°
M14 X 2.0	2	11.5	12	24	75	4	60°
M16 X 2.0	2	13.5	14	28	80	4	60°
M20 X 2.5	2.5	15	16	30	80	4	60°

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

REAMER

STRAIGHT FLUTE

FOR ALL TYPES OF GENERAL REAMING APPLICATIONS.

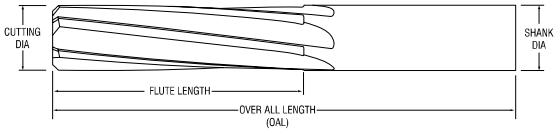
LEFT HELIX FLUTE

PRODUCES BETTER FINISHES ON HARD MATERIALS SUCH AS HEAT-TREATED STEELS. SHEAR ACTION IS EXCELLENT FOR HOLES WITH INTERRUPTIONS;

RIGHT HELIX FLUTE

FOR BLIND HOLES AND ABRASIVE, DUCTILE MATERIALS. DO NOT USE FOR HOLES WITH INTERRUPTIONS UNLESS MATERIALS IS REASONABLY SOFT.

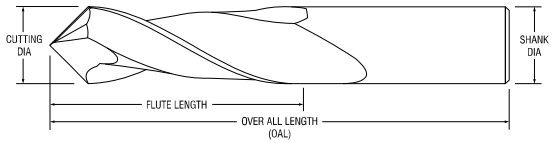
REAMER				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
RM 4 030 T	3	3	16	57
RM 4 040 T	4	4	25	63
RM 4 050 T	5	5	25	63
RM 4 060 T	6	6	25	76
RM 6 070 T	7	7	29	76
RM 6 080 T	8	8	29	76
RM 6 090 T	9	9	32	76
RM 6 100 T	10	10	38	101
RM 6 110 T	11	11	38	101
RM 6 120 T	12	12	38	101
RM 6 130 T	13	13	45	125
RM 6 140 T	14	14	45	125
RM 6 150 T	15	15	50	125
RM 6 160 T	16	16	50	125



***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

DMCT

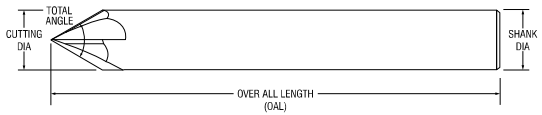
DRILL MILL CHAMFER TOOL				
ITEM CODE	MILL DIA	SHANK DIA	FLUTE	OAL
DMCT2 030	3	6	6	51
DMCT2 040	4	6	8	51
DMCT2 050	5	6	10	51
DMCT2 060	6	6	12	63
DMCT2 080	8	8	16	63
DMCT2 100	10	10	20	70
DMCT2 120	12	12	22	76
DMCT2 140	14	14	25	89
DMCT2 160	16	16	28	89



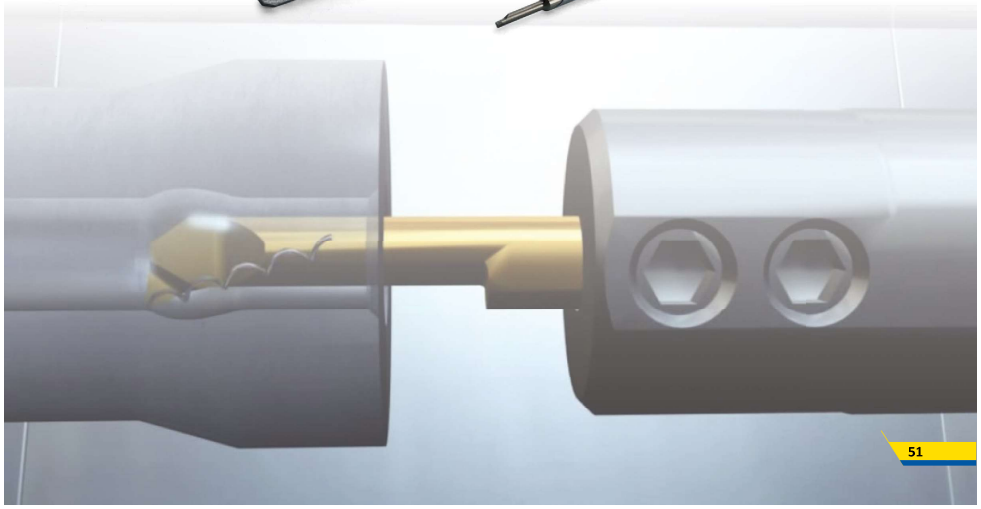
CHAMFER CUTTER

2 FLUTE CHAMFER CUTTER				
ITEM CODE	MILL DIA	SHANK DIA	OAL	ANGLE
TCHF2 030	3	3	39	90º
TCHF2 040	4	4	51	90º
TCHF2 050	5	5	51	90º
TCHF2 060	6	6	63	90º
TCHF2 080	8	8	63	90º
TCHF2 100	10	10	70	90º
TCHF2 120	12	12	75	90º
TCHF2 140	14	14	80	90º
TCHF2 160	16	16	80	90º
TCHF2 180	18	18	101	90º
TCHF2 200	20	20	101	90º

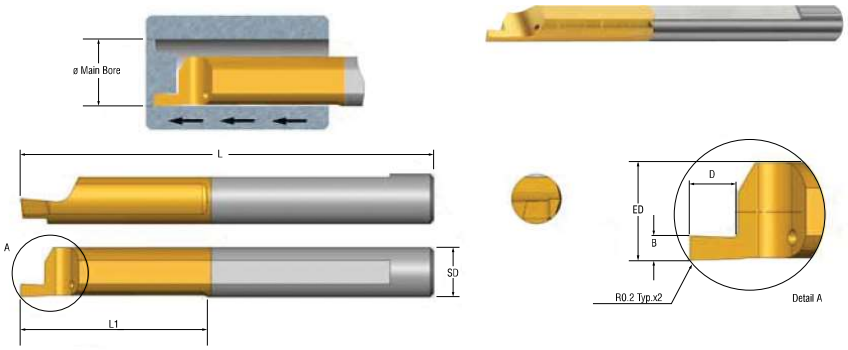
4 FLUTE CHAMFER CUTTER				
ITEM CODE	MILL DIA	SHANK DIA	OAL	ANGLE
TCHF4 030	3	3	39	90º
TCHF4 040	4	4	51	90º
TCHF4 050	5	5	51	90º
TCHF4 060	6	6	63	90º
TCHF4 080	8	8	63	90º
TCHF4 100	10	10	70	90º
TCHF4 120	12	12	75	90º
TCHF4 140	14	14	80	90º
TCHF4 160	16	16	80	90º
TCHF4 180	18	18	101	90º
TCHF4 200	20	20	101	90º



***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).



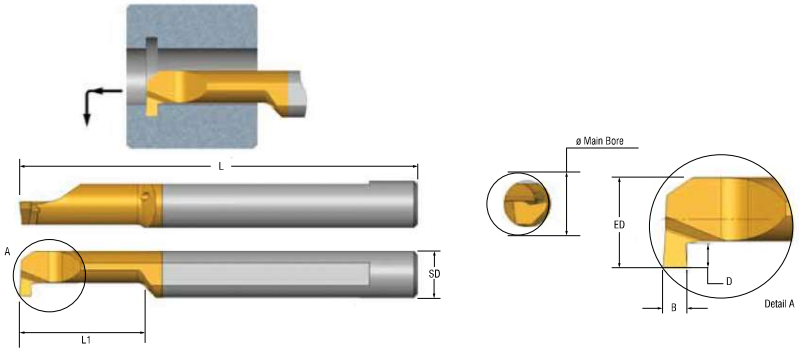
FACE GROOVING



FACE GROOVING TOOL							
ITEM CODE	SIZE DESCRIPTION	ENTRY DIA	SHANK DIA	WIDTH (B)	DEPTH (D)	L1	L
TTRFE0000001	S/C TFR E4 S4 B0.75 D1.2 L15	4	4	0.75	1.2	15	50
TTRFE0000002	S/C TFR E4 S4 B1.0 D1.5 L15	4	4	1	1.5	15	50
TTRFE0000003	S/C TFR E4 S4 B1.5 D2.8 L15	4	4	1.5	2.8	15	50
TTRFE0000004	S/C TFR E5 S5 B0.75 D1.2 L22	5	5	0.75	1.2	22	50
TTRFE0000005	S/C TFR E5 S5 B1.0 D1.5 L22	5	5	1	1.5	22	50
TTRFE0000006	S/C TFR E5 S5 B1.5 D2.5 L22	5	5	1.5	2.5	22	50
TTRFE0000007	S/C TFR E5 S5 B2.0 D3.8 L22	5	5	2	3.8	22	50
TTRFE0000008	S/C TFR E6 S6 B1.0 D1.5 L22	6	6	1	1.5	22	63
TTRFE0000009	S/C TFR E6 S6 B1.5 D2.5 L22	6	6	1.5	2.5	22	63
TTRFE0000010	S/C TFR E6 S6 B2.0 D3.0 L22	6	6	2	3	22	63
TTRFE0000011	S/C TFR E6 S6 B2.5 D4.8 L22	6	6	2.5	4.8	22	63
TTRFE0000012	S/C TFR E6 S6 B3.0 D6.0 L22	6	6	3	6	22	63
TTRFE0000013	S/C TFR E8 S8 B2.5 D3.5 L22	6	6	2.5	3.5	22	63

***NOTE:** ALL DIMENSIONS ARE IN MILLIMETRE (mm).

INTERNAL GROOVING

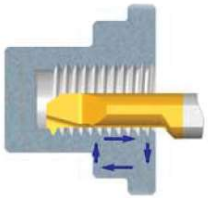


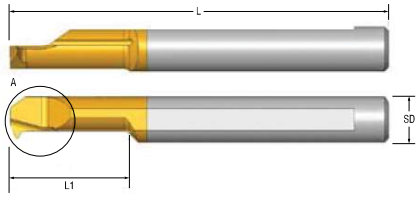
INTERNAL GROOVING TOOL							
ITEM CODE	SIZE DESCRIPTION	ENTRY DIA	SHANK DIA	WIDTH (B)	DEPTH (D)	L1	L
TTGRE0000001	S/C TGR E2.7 S3 B0.7 D0.6 L10	E2.7	3	0.7	0.6	10	39
TTGRE0000002	S/C TGR E3.7 S4 B0.5 D0.5 L10	E3.7	4	0.5	0.5	10	50
TTGRE0000003	S/C TGR E3.7 S4 B0.7 D0.6 L10	E3.7	4	0.7	0.6	10	50
TTGRE0000004	S/C TGR E3.7 S4 B1.0 D1.0 L10	E3.7	4	1	1	10	50
TTGRE0000005	S/C TGR E3.7 S4 B1.0 D1.0 L15	E3.7	4	1	1	15	50
TTGRE0000006	S/C TGR E3.7 S4 B1.5 D1.0 L10	E3.7	4	1.5	1	10	50
TTGRE0000007	S/C TGR E4.8 S5 B1.0 D1.2 L15	E4.8	5	1	1.2	15	50
TTGRE0000008	S/C TGR E4.8 S5 B1.0 D1.2 L22	E4.8	5	1	1.2	22	50
TTGRE0000009	S/C TGR E4.8 S5 B1.5 D1.2 L15	E4.8	5	1.5	1.2	15	50
TTGRE0000010	S/C TGR E4.8 S5 B1.5 D1.2 L22	E4.8	5	1.5	1.2	22	50
TTGRE0000011	S/C TGR E4.8 S5 B2.0 D1.2 L15	E4.8	5	2	1.2	15	50
TTGRE0000012	S/C TGR E4.8 S5 B2.0 D1.2 L22	E4.8	5	2	1.2	22	50
TTGRE0000013	S/C TGR E5.8 S6 B1.0 D1.4 L15	E5.8	6	1	1.4	15	63
TTGRE0000014	S/C TGR E5.8 S6 B1.0 D1.4 L22	E5.8	6	1	1.4	22	63
TTGRE0000015	S/C TGR E5.8 S6 B1.5 D1.4 L15	E5.8	6	1.5	1.4	15	63
TTGRE0000016	S/C TGR E5.8 S6 B1.5 D1.4 L22	E5.8	6	1.5	1.4	22	63
TTGRE0000017	S/C TGR E5.8 S6 B2.0 D1.4 L15	E5.8	6	2	1.4	15	63
TTGRE0000018	S/C TGR E5.8 S6 B2.0 D1.4 L22	E5.8	6	2	1.4	22	63
TTGRE0000019	S/C TGR E5.8 S6 B1.0 D1.8 L17	E5.8	6	1	1.8	17	63
TTGRE0000020	S/C TGR E5.8 S6 B1.5 D1.8 L17	E5.8	6	1.5	1.8	17	63
TTGRE0000021	S/C TGR E5.8 S6 B2.0 D1.8 L17	E5.8	6	2	1.8	17	63
TTGRE0000022	S/C TGR E6.8 S7 B1.0 D2.5 L15	E6.8	7	1	2.5	15	63
TTGRE0000023	S/C TGR E6.8 S7 B1.0 D2.5 L22	E6.8	7	1	2.5	22	63
TTGRE0000024	S/C TGR E6.8 S7 B1.0 D2.5 L30	E6.8	7	1	2.5	30	63
TTGRE0000025	S/C TGR E6.8 S7 B1.5 D2.5 L15	E6.8	7	1.5	2.5	15	63
TTGRE0000026	S/C TGR E6.8 S7 B1.5 D2.5 L22	E6.8	7	1.5	2.5	22	63
TTGRE0000027	S/C TGR E6.8 S7 B1.5 D2.5 L30	E6.8	7	1.5	2.5	30	63
TTGRE0000028	S/C TGR E6.8 S7 B2.0 D2.5 L15	E6.8	7	2	2.5	15	63
TTGRE0000029	S/C TGR E6.8 S7 B2.0 D2.5 L22	E6.8	7	2	2.5	22	63
TTGRE0000030	S/C TGR E6.8 S7 B2.0 D2.5 L30	E6.8	7	2	2.5	30	63
TTGRE0000031	S/C TGR E7.8 S8 B1.0 D1.7 L22	E7.8	8	1	1.7	22	63
TTGRE0000032	S/C TGR E7.8 S8 B1.5 D1.7 L22	E7.8	8	1.5	1.7	22	63
TTGRE0000033	S/C TGR E7.8 S8 B2.0 D2.6 L22	E7.8	8	2	2.6	22	63

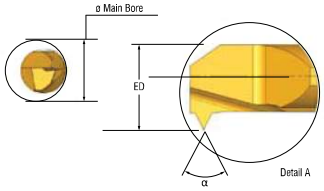
Note: For L.H. bars specify TGL instead of TGR Order example: S/C TGR E2.7 S3 B0.7 D0.6 L10

ALL DIMENSIONS ARE IN MILLIMETRE (mm).

INTERNAL THREADING TOOL





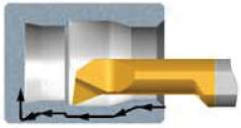


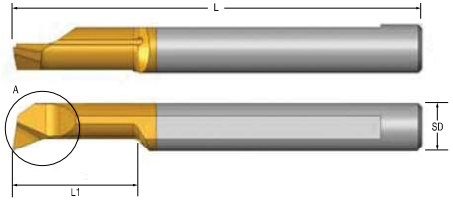
INTERNAL THREADING TOOL							
ITEM CODE	SIZE DESCRIPTION	ENTRY DIA	SHANK DIA	TA α	PITCH RANGE	L1	L
TITTL0000001	S/C TTR E2.9 S3 P0510 L15 α55°	2.9	3	55°	0.5-1.0	15	39
TITTL0000002	S/C TTR E3.8 S4 P0510 L15 α55°	3.8	4	55°	0.5-1.0	15	50
TITTL0000003	S/C TTR E4.8 S5 P05125 L15 α55°	4.8	5	55°	0.5-1.25	15	50
TITTL0000004	S/C TTR E4.8 S5 P05125 L22 α55°	4.8	5	55°	0.5-1.25	22	50
TITTL0000005	S/C TTR E5.6 S6 P0515 L15 α55°	5.6	6	55°	0.5-1.5	15	63
TITTL0000006	S/C TTR E5.6 S6 P0515 L22 α55°	5.6	6	55°	0.5-1.5	22	63
TITTL0000007	S/C TTR E2.9 S3 P0710 L15 α60°	2.9	3	60°	0.7-1.0	15	39
TITTL0000008	S/C TTR E3.8 S4 P0810 L15 α60°	3.8	4	60°	0.8-1.0	15	50
TITTL0000009	S/C TTR E4.8 S5 P10125 L15 α60°	4.8	5	60°	1.0-1.25	15	50
TITTL0000010	S/C TTR E4.8 S5 P10125 L22 α60°	4.8	5	60°	1.0-1.25	22	50
TITTL0000011	S/C TTR E5.6 S6 P1015 L15 α60°	5.6	6	60°	1.0-1.5	15	63
TITTL0000012	S/C TTR E5.6 S6 P1015 L22 α60°	5.6	6	60°	1.0-1.5	22	63
TITTL0000013	S/C TTR E7.6 S8 P1020 L22 α60°	7.6	8	60°	1.0-2.0	22	63
TITTL0000014	S/C TTR E2.5 S3 L10 M3X0.5	2.5	3	60°	0.5	10	39
TITTL0000015	S/C TTR E2.9 S3 L15 M4X0.5	2.9	3	60°	0.5	15	39
TITTL0000016	S/C TTR E2.9 S3 L15 M4X0.7	2.9	3	60°	0.7	15	39
TITTL0000017	S/C TTR E2.9 S3 L15 M4X0.75	2.9	3	60°	0.75	15	39
TITTL0000018	S/C TTR E3.8 S4 L15 M5X0.5	3.8	4	60°	0.5	15	50
TITTL0000019	S/C TTR E3.8 S4 L15 M5X0.75	3.8	4	60°	0.75	15	50
TITTL0000020	S/C TTR E3.8 S4 L15 M5X0.8	3.8	4	60°	0.8	15	50
TITTL0000021	S/C TTR E4.7 S5 L15 M6X1.0	4.7	5	60°	1	15	50
TITTL0000022	S/C TTR E5.8 S6 L15 M8X1.25	5.8	6	60°	1.25	15	63

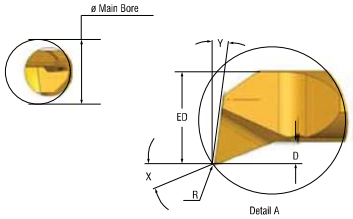
Note: For R.H. bars specify TTR instead of TTL Order example: S/C TTL E2.9 S3 P0510 L15 α55°

ALL DIMENSIONS ARE IN MILLIMETRE (mm).

INTERNAL BORING TOOL







INTERNAL BORING TOOL									
ITEM CODE	SIZE DESCRIPTION	ENTRY DIA	SHANK DIA	RADIUS (R)	DEPTH (D)	X	Y	L1	L
TTBRE0000001	S/C TBR E2.8 S3 R0.05 D0.7 L10	2.8	3	0.05	0.7	22º	8º	10	50
TTBRE0000002	S/C TBR E2.8 S3 R0.05 D0.7 L15	2.8	3	0.05	0.7	22º	8º	15	50
TTBRE0000003	S/C TBR E2.8 S3 R0.1 D0.7 L15	2.8	3	0.1	0.7	22º	8º	15	50
TTBRE0000004	S/C TBR E2.8 S3 R0.1 D0.7 L22	2.8	3	0.1	0.7	22º	8º	22	50
TTBRE0000005	S/C TBR E2.8 S3 R0.2 D0.7 L10	2.8	3	0.2	0.7	22º	8º	10	50
TTBRE0000006	S/C TBR E2.8 S3 R0.2 D0.7 L15	2.8	3	0.2	0.7	22º	8º	15	50
TTBRE0000007	S/C TBR E2.8 S3 R0.2 D0.7 L22	2.8	3	0.2	0.7	22º	8º	22	50
TTBRE0000008	S/C TBR E3.7 S4 R0.1 D0.8 L10	3.7	4	0.1	0.8	22º	8º	10	50
TTBRE0000009	S/C EBR E3.7 S4 R0.1 D0.8 L15	3.7	4	0.1	0.8	22º	8º	15	50
TTBRE0000010	S/C TBR E3.7 S4 R0.1 D0.8 L22	3.7	4	0.1	0.8	22º	8º	22	50
TTBRE0000011	S/C TBR E3.7 S4 R0.2 D0.8 L10	3.7	4	0.2	0.8	22º	8º	10	50
TTBRE0000012	S/C TBR E3.7 S4 R0.2 D0.8 L15	3.7	4	0.2	0.8	22º	8º	15	50
TTBRE0000013	S/C TBR E3.7 S4 R0.2 D0.8 L22	3.7	4	0.2	0.8	22º	8º	22	50
TTBRE0000014	S/C TBR E4.6 S5 R0.1 D1.2 L22	4.6	5	0.1	1.2	22º	8º	22	50
TTBRE0000015	S/C TBR E4.6 S5 R0.1 D1.2 L30	4.6	5	0.1	1.2	22º	8º	30	50
TTBRE0000016	S/C TBR E4.6 S5 R0.2 D1.2 L10	4.6	5	0.2	1.2	22º	8º	10	50
TTBRE0000017	S/C TBR E4.6 S5 R0.2 D1.2 L15	4.6	5	0.2	1.2	22º	8º	15	50
TTBRE0000018	S/C TBR E4.6 S5 R0.2 D1.2 L22	4.6	5	0.2	1.2	22º	8º	22	50
TTBRE0000019	S/C TBR E4.6 S5 R0.2 D1.2 L30	4.6	5	0.2	1.2	22º	8º	30	50
TTBRE0000020	S/C TBR E5.8 S6 R0.2 D1.4 L15	5.8	6	0.2	1.4	22º	8º	15	63
TTBRE0000021	S/C TBR E5.8 S6 R0.2 D1.4 L22	5.8	6	0.2	1.4	22º	8º	22	63
TTBRE0000022	S/C TBR E5.8 S6 R0.2 D1.4 L30	5.8	6	0.2	1.4	22º	8º	30	63
TTBRE0000023	S/C TBR E6.8 S7 R0.2 D1.5 L22	6.8	7	0.2	1.5	22º	8º	22	63
TTBRE0000024	S/C TBR E6.8 S7 R0.2 D1.5 L30	6.8	7	0.2	1.5	22º	8º	30	63
TTBRE0000025	S/C TBR E6.8 S7 R0.2 D1.5 L35	6.8	7	0.2	1.5	22º	8º	35	63
TTBRE0000026	S/C TBR E7.8 S8 R0.2 D1.6 L15	7.8	8	0.2	1.6	22º	8º	15	63
TTBRE0000027	S/C TBR E7.8 S8 R0.2 D1.6 L22	7.8	8	0.2	1.6	22º	8º	22	63
TTBRE0000028	S/C TBR E7.8 S8 R0.2 D1.6 L35	7.8	8	0.2	1.6	22º	8º	35	63
TTBRE0000029	S/C TBR E9.8 S10 R0.2 D2.0 L35	9.8	10	0.2	2	22º	8º	35	70

Note: For L.H. bars specify TBL instead of TBR Order example: S/C TBR E2.8 S3 R0.05 D0.7 L10

ALL DIMENSIONS ARE IN MILLIMETRE (mm).

T-SLOT

ASSEMBLE PART

PROFILE TOOL

DOVETAIL

PROFILE TOOL

INNER RADIUS

3 FLUTE DRILL

TAPER ENDMILL

PROFILE TOOL

TOP & BACK CHAMFER

CUSTOMIZED TOOLS

PROFILE TOOL

PUNCH

ENGRAVING

PUNCH

ENGRAVING

SPHERICAL BALL

PROFILE T-SLOT

DOVETAIL

PROFILE T-SLOT

PROFILE TOOL

CUSTOMIZED TOOLS

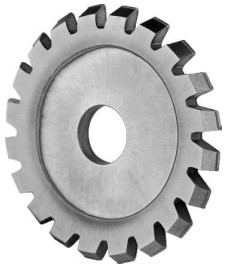
PROFILE TOOL

UP-DOWN CUTTER

IRRIGATION TOOL

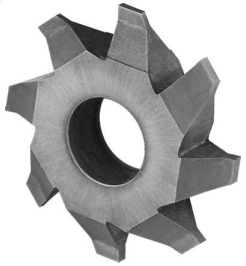
PROFILE DOVETAIL

PROFILE T-SLOT



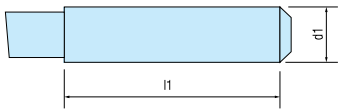
SLITTING CUTTER

SLITTING CUTTER



SLITTING CUTTER

HA plain



HB, with drive falt

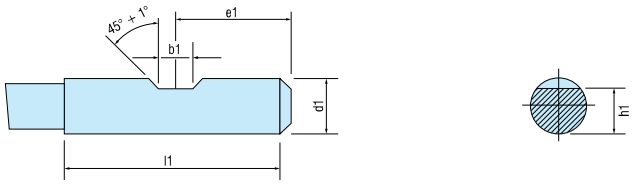


Fig. 1
d1 = for drills ø 6 - 20 mm

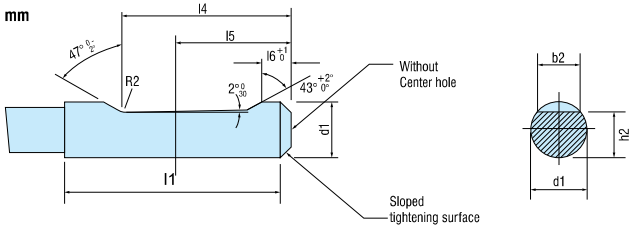
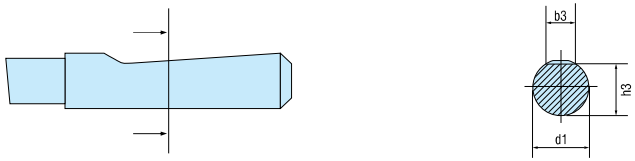


Fig. 2
d1 = for drills ø 25 - 32 mm



DIMENSIONS IN MM	
d1 h6	l1 0 +2
3	28
4	28
5	28
6	36
8	36
10	40
12	45
14	45
16	48
18	48
20	50
25	56

DIMENSIONS IN MM				
d1 h6	b1 0/+0.05	e1 0/-1	h1 h11	l1 0/+2
6	4.2	18	5.1	36
8	5.5	18	6.9	36
10	7	20	8.5	40
12	8	22.5	10.4	45
14	8	22.5	12.7	45
16	10	24	14.2	48
18	10	24	16.2	48
20	11	25	18.2	50

DIMENSIONS IN MM								
d1 h6	b2 0	b3	h2 h11	h3	l1 0/+2	l4 0/-1	l5 nom,size	r2 min.
6	4.3		5.1		36	25	18	1.2
8	5.5		6.9		36	25	18	1.2
10	7.1		8.5		40	28	20	1.2
12	8.2		10.4		45	33	22.5	1.2
14	8.1		12.7		45	33	22.5	1.2
16	10.1		14.2		48	36	24	1.6
18	10.8		16.2		48	36	24	1.6
20	11.4	9.3	18.2		50	38	25	1.6
25	13.6	9.9	23		56	44	32	1.6
32	15.5		30		60	48	35	1.6

FORMULA FOR PERFECTION

IN THE **LEAD** WITH **CUSTOMER SERVICE.**

CALCULATION FOR CUTTING SPEED, SPINDLE SPEED AND FEED

Cutting Speed	$Vc = \frac{\pi \times D \times n}{1000}$
Spindle Speed	$n = \frac{Vc - 1000}{\pi \times D}$
Feed Per Tooth	$fz = \frac{V_f}{n \times z}$
Feed Per Minute	$V_f = f_z \times z \times n$
Feed Per Revolution	$f = f_z \times z$

.	z = No. of Teeth
mm	D = Milling Cutter Diameter
rpm	n = Spindle Speed
m/min	Vc = Cutting Speed
mm/min	Vf = Feed Per Minute
mm	Fz = Feed per Tooth

DO YOU NEED SPECIAL TOOLS ?

TIXNA WILL PRODUCE INDIVIDUAL TOOLS FOR YOUR SPECIAL APPLICATION FOR BETTER JOB.

WE ARE MANUFACTURING SOLID CARBIDE SPECIAL TOOL AS CUSTOMER REQUIREMENT. TOOL ARE PRODUCED ACCORDING TO YOUR DRAWING SPECIFICATION ON THE MOST MODERN, FULLY AUTOMATIC GRINDING MACHINES.

ENDMILL

Cutting Speed	$Vc = \frac{\pi \times D \times n}{1000}$ mt/min
Table Feed	$V_f = f_z \times z \times n$ mm/min

CUTTING SPEED (Vc) TABLE

ITEM	MATERIAL GROUP	HRC	Vc
Regular	Cast Iron, Aluminum, Brass, Copper	28-32	60-70
UTP	High Carbon Steel, EN-9, EN-21	38-42	50-60
XP	Tool Steel, P20, Die Steel, OHNS, EN-31, Stainless Steel	55-60	35-45

TABLE FEED (Fz) CHART

Dia of Endmill	Fz (Feed Per Tooth)
ø1 - ø2	0.008 - 0.010
ø2 - ø3	0.010 - 0.012
ø3 - ø4	0.012 - 0.015
ø4 - ø6	0.015 - 0.025
ø6 - ø8	0.025 - 0.035
ø8 - ø10	0.035 - 0.050
ø10 - ø12	0.050 - 0.060
ø12 - ø16	0.060 - 0.070
ø16 - ø20	0.070 - 0.080
ø20 - ø25	0.080 - 0.100

DRILL

Cutting Speed	$Vc = \frac{\pi \times D \times n}{1000}$	mt/min
Feed Per Minute	$V_f = n \times f$	mm/min

CUTTING SPEED (Vc) TABLE

ITEM	MATERIAL GROUP	HRC	Vc
Regular	Cast Iron, Aluminum, Brass, Mild Steel	25-28	80-90
XP	EN Series,	30-35	70-80
XP	High - hardened Steel, Stainless Steel	50-60	20-30

FEED PER REVOLUTION (f) CHART

Dia of Drill	Fz (Feed Per Tooth)
ø2 - ø4	0.020 - 0.030
ø4 - ø6	0.030 - 0.050
ø6 - ø8	0.060 - 0.080
ø8 - ø10	0.080 - 0.100
ø10 - ø12	0.100 - 0.120
ø12 - ø16	0.120 - 0.150

REAMER

Cutting Speed	$Vc = \frac{\pi \times D \times n}{1000}$	mt/min
Feed Per Minute	$V_f = fz \times z \times n$	mm/min

CUTTING SPEED (Vc) TABLE

MATERIAL GROUP	Vc
Cast Iron, Aluminum, Copper	50-60
Mild Steel, EN-8	40-50
High Hardened Steel, Stainless Steel	25-40

FEED PER REVOLUTION (f) CHART

Dia of Remer	Fz (Feed Per Tooth)
ø2 - ø4	0.060 - 0.100
ø4 - ø6	0.100 - 0.120
ø6 - ø8	0.120 - 0.150
ø8 - ø10	0.150 - 0.180
ø10 - ø12	0.180 - 0.200
ø12 - ø16	0.200 - 0.250
ø16 - ø20	0.250 - 0.400

TROUBLESHOOTING FOR ENDMILL

FAILURE	CAUSE		SOLUTION
Excessive Wear	Cutting Conditions Tool Shape Tool Material	. Cutting speed is to fast . Feed rate is too fast . The flank relief angle is to small . Insufficient wear resistance	. Decrease cutting speed and feed rate. . Change to an appropriate flank relief angle . Select a substrate with more wear resistance . Use a coated tool
Chipping	Cutting Conditions Machine Area	. Feed rate is to fast . Cutting depth is to deep . Tool overhang is to long . Work clamps are weak . Tool is not firmly attached	. Decrease cutting speed . Reduce depth of cut . Adjust tool overhang for correct length . Clamp the work place firmly . Make sure the tool is seated in the chuck property
Tool Fracture	Cutting Conditions Tool Shape	. Feed rate is to fast . Cutting depth is to deep . Tool overhang is to long . Cutting edge is to long . Web thickness is to small	. Decrease cutting speed . Reduce depth of cut . Reduce tool overhang as much as possible . Select a tool with a shorter cutting edge . Change to more appropriate web thickness
Shoulder Deflection	Cutting Conditions Tool Shape	. Feed rate is to fast . Cutting depth is to deep . Tool overhang is to long . Cutting on the down-cut . Helix angle is large . Web thickness is to thin	. Decrease cutting speed . Reduce depth of cut . Adjust tool overhang for correct length . Change directions to up-cut . Use a tool with a smaller helix angle . Use a tool with the appropriate web thickness
Unsatisfactory Machined Surface Finish	Cutting Conditions	. Feed rate is too fast . Packing of chips	. Decrease cutting speed . Use air blow . Use an insert with a larger relief pocket
Chattering	Cutting Conditions Tool Shape Machine Area	. Cutting speed is to fast . Cutting on the up-cut . Tool overhang is to long . Rake angle is large . Work clamps are weak . Tool is not firmly attached	. Decrease cutting speed . Change directions to down-cut . Adjust tool overhang for correct length . Use a tool with an appropriate rake angle . Clamp the work piece firmly . Make sure the tool is seated in the chuck properly
Packing of Chips	Cutting Conditions Tool Shape	. Feed rate too fast . Cutting depth is to deep . Too many teeth . Packing of chips	. Decrease cutting speed . Reduce depth of cut . Reduce number of teeth . Use air blow

TROUBLESHOOTING FOR DRILLING

FAILURE	CAUSE	SOLUTION
Broken or twisted tangs	. Bad fit between shank and socket	Ensure the shank and socket are clean and free from damage
Splitting of the web	. Feed to High . Insufficient initial clearance . Excessive web thinning . Heavy impact at point drill	. Reduce feed to optimum rate . Re-grind to correct specification . Re-grind to correct specification . Avoid impact at the point of drill. Take care with taper shank drills when inserting / ejecting them from a spindle
Worn outer corners	. Excessive speed	. Reduce speed to optimum - may be able to increase feed
Broken outer Corners	. Unstable component set up	. Reduce movement in the component
Chipped cutting lips	. Excessive initial clearance	. Re-grind to correct specification
Breakage at flute run out	. Choking of flutes . Drill Slipping	. Adopt a peck / series drilling concept . Ensure the drill is held securely in the chuck and spindle
Spiral finish in hole	. Insufficient feed . Bad positional accuracy	. Increase feed . Use a spot drill before drilling
Hole size to large	. Incorrect point geometry . Ineffective swarf clearance	. Check point geometry in re-grinding section . Adjust speed, feed and peck length to achieve more manageable swarf

TROUBLESHOOTING FOR REAMING

FAILURE	CAUSE	SOLUTION
Broken or twisted tangs	. Incorrect fit between shank and socket	Ensure the shank and the socket are clean and free from damage
Rapid tool wear	. Insufficient stock to remove	. Increase the amount of stock to be removed
Oversize Hole	. Excessive lip height variation . Displacement in the machine spindle . Defects on the tool holder . Tool shank is damaged . Ovallity of the tool . Asymmetric bevel lead angle . Too high feed or cutting speed	. Re-grind to correct specification . Repair and rectify spindle displacement . Replace tool holder . Replace or re-grind the shank . Replace or re-grind the tool . Re-grind to correct specification . Adjust cutting conditions in accordance with Catalogue or Product Selector
Undersize hole	. Insufficient stock to remove . Too much heat generated while reaming. The hole widens and shrinks . The tool diameter is worn and is undersize . Too low feed or cutting speed . Pre-drilled hole is to small	. Increase the amount of stock to be removed . Increase coolant flow . Re-grind to correct specification . Adjust cutting conditions in accordance with the Dormer Product Selector . Decrease the amount of stock to be removed
Oval and conical holes	. Displacement in the machine spindle . Misalignment between tool and hole . Asymmetric bevel lead angle	. Repair and rectify spindle displacement . Use a bridge reamer . Re-grind to correct specification

ISO TOLERANCE CHART

ISO Tolerances for Holes (ISO 286-2)

	Nominal hole sizes (mm)																			
Over	3	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355
Inc.	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355	400
	Micrometres																			
E6	28	34	43	53	66		79		94		110			129			142		161	
	20	25	32	40	50		60		72		85			100			110		125	
E7	32	40	50	61	75		90		107		125			146			162		185	
	20	25	32	40	50		60		72		85			100			110		125	
E11	95	115	142	170	210		250		292		335			390			430		485	
	20	25	32	40	50		60		72		85			100			110		125	
E12	140	175	212	250	300		360		422		485			560			630		695	
	20	25	32	40	50		60		72		85			100			110		125	
E13	200	245	302	370	440		520		612		715			820			920		+1 015	
	20	25	32	40	50		60		72		85			100			110		125	
F6	18	22	27	33	41		49		58		68			79			88		98	
	10	13	16	20	2		30		36		43			50			56		62	
F7	22	28	34	41	50		60		71		83			96			108		119	
	10	13	16	20	25		30		36		43			50			56		62	
F8	28	35	43	53	64		76		90		106			122			137		151	
	10	13	16	20	25		30		36		43			50			56		62	
G6	12	14	17	20	25		29		34		39			44			49		54	
	4	5	6	7	9		10		12		14			15			17		18	
G7	16	20	24	28	34		40		47		54			61			69		75	
	4	5	6	7	9		10		12		14			15			17		18	
G8	22	27	33	40	48		56		66		77			87			98		107	
	4	5	6	7	9		10		12		14			15			17		18	
H6	8	9	11	13	16		19		22		25			29			32		36	
	0	0	0	0	0		0		0		0			0			0		0	
H7	12	15	18	21	25		30		35		40			46			52		57	
	0	0	0	0	0		0		0		0			0			0		0	
H8	18	22	27	33	39		46		54		63			72			81		89	
	0	0	0	0	0		0		0		0			0			0		0	
H9	30	36	43	52	62		74		87		100			115			130		140	
	0	0	0	0	0		0		0		0			0			0		0	
H10	48	58	70	84	100		120		140		160			185			210		230	
	0	0	0	0	0		0		0		0			0			0		0	
H11	75	90	110	130	160		190		220		250			290			320		360	
	0	0	0	0	0		0		0		0			0			0		0	

ISO Tolerances for Holes (ISO 286-2)

	Nominal hole sizes (mm)																			
Over	3	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355
Inc.	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355	400
	Micrometres																			
J6	5	5	6	8	10		13		16		18			22			25		29	
	-3	-4	-5	-5	-6		-6		-6		-7			-7			-7		-7	
J7	6	8	10	12	14		18		22		26			30			36		39	
	-6	-7	-8	-9	-11		-12		-13		-14			-16			-16		-18	
J8	10	12	15	20	24		28		34		41			47			55		60	
	-8	-10	-12	-13	-15		-18		-20		-22			-25			-26		-29	
JS6	4	+4.5	+5.5	+6.5	8		+9.5		11		+12.5			+14.5			16		18	
	-4	-4.5	-5.5	-6.5	-8		-9.5		-11		-12.5			-14.5			-16		-18	
JS7	6	+7.5	9	+10.5	+12.5		15		+17.5		20			23			26		+28.5	
	-6	-7.5	-9	-10.5	-12.5		-15		-17.5		-20			-23			-26		-28.5	
JS8	9	11	+13.5	+16.5	+19.5		23		27		+31.5			36			+40.5		+44.5	
	-9	-11	-13.5	-16.5	-19.5		-23		-27		-31.5			-36			-40.5		-44.5	
K6	2	2	2	2	3		4		4		4			5			5		7	
	-6	-7	-9	-11	-13		-15		-18		-21			-24			-27		-29	
K7	3	5	6	6	7		9		10		12			13			16		17	
	-9	-10	-12	-15	-18		-21		-25		-28			-33			-36		-40	
K8	5	6	8	10	12		14		16		20			22			25		28	
	-13	-16	-19	-23	-27		-32		-38		-43			-50			-56		-61	
M6	-1	-3	-4	-4	-4		-5		-6		-8			-8			-9		-10	
	-9	-12	-15	-17	-20		-24		-28		-33			-37			-41		-46	
M7	0	0	0	0	0		0		0		0			0			0		0	
	-12	-15	-18	-21	-25		-30		-35		-40			-46			-52		-57	
M8	2	1	2	4	5		5		6		8			9			9		11	
	-16	-21	-25	-29	-34		-41		-48		-55			-63			-72		-78	
N6	-5	-7	-9	-11	-12		-14		-16		-20			-22			-25		-26	
	-13	-16	-20	-24	-28		-33		-38		-45			-51			-57		-62	
N7	-4	-4	-5	-7	-8		-9		-10		-12			-14			-14		-16	
	-16	-19	-23	-28	-33		-39		-45		-52			-60			-66		-73	
N8	-2	-3	-3	-3	-3		-4		-4		-4			-5			-5		-5	
	-20	-25	-30	-36	-42		-50		-58		-67			-77			-86		-94	
P6	-9	-12	-15	-18	-21		-26		-30		-36			-41			-47		-51	
	-17	-21	-26	-31	-37		-45		-52		-61			-70			-79		-87	
P7	-8	-9	-11	-14	-17		-21		-24		-28			-33			-36		-41	
	-20	-24	-29	-35	-42		-51		-59		-68			-79			-88		-98	
P8	-12	-15	-18	-22	-26		-32		-37		-43			-50			-56		-62	
	-30	-37	-45	-55	-65		-78		-91		-106			-122			-137		-151	
R6	-12	-16	-20	-24	-29	-35	-37	-44	-47	-56	-58	-61	-68	-71	-75	-85	-89	-97	-103	
	-20	-25	-31	-37	-45	-54	-56	-66	-69	-81	-83	-86	-97	-100	-104	-117	-121	-133	-139	
R7	-11	-13	-16	-20	-25	-30	-32	-38	-41	-48	-50	-53	-60	-63	-67	-74	-78	-87	-93	
	-23	-28	-34	-41	-50	-60	-62	-73	-76	-88	-90	-93	-106	-109	-113	-126	-130	-144	-150	