

ISO13399

De volgende tabel toont ISO13399-conforme dimensionele symbolen.

Inhoud die overeenkomt met de voorbeeldsymbolen/notaties wordt hieronder weergegeven.

Diagrammen van gereedschapsvormen en voorraadgrafieken maken gebruik van de symbolen en voorbeeldnotaties uit de onderstaande tabel.

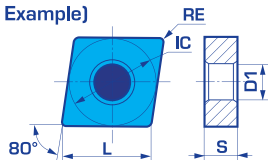
(1) Inserts (For Turning / For Milling)

Symbol	Description
AN	Clearance angle major
APMX	Depth of cut maximum
BS	Wiper edge length
CDX	Cutting depth maximum
CHW	Corner chamfer width
CW	Cutting width
D1	Fixing hole diameter
DMIN	Minimum bore diameter
IC	Inscribed circle diameter
INSL	Insert length
L	Cutting edge length
PDX	Profile distance ex
PDY	Profile distance ey
PNA	Profile included angle
RE	Corner radius
RER	Right side corner radius
REL	Left side corner radius
S	Insert thickness
W1	Insert width
WF	Functional width

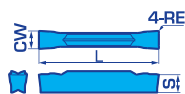
(2) Tool Holders For Turning

Symbol	Description
APMX	Depth of cut maximum
B	Shank width
BD	Body diameter
COX	Cutting depth maximum
CRKS	Connection retention knob thread size
DC	Cutting diameter
DCB	Connection bore diameter
OCON	Connection diameter
DCSFMS	Contact surface diameter machine side
DMIN	Minimum bore diameter
DMM	Shank diameter
DN	Neck diameter
GAMF	Rake angle radial
GAMP	Rake angle axial
H	Shank height
HBH	Head bottom offset height
HBKL	Head back offset length
HBKW	Head back offset width
HBL	Head bottom offset length
HF	Functional height
KDP	Groove depth
KWW	Keyway width
LF	Functional length
LH	Head length
LHD	Head length
LS	Shank length
LSCX	Clamping length maximum
LU	Usable length
LUX	Usable length maximum
WF	Functional width

(Turning Insert Example)



(Grooving Insert Example)



(External Holder Example)

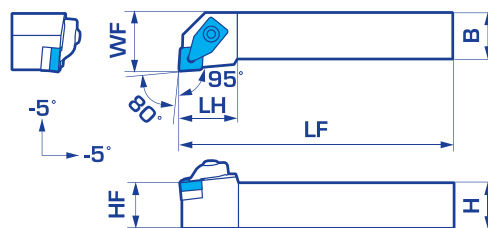
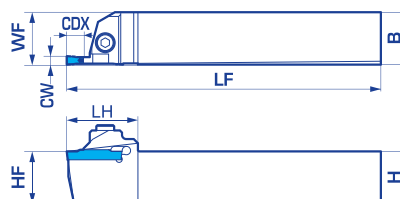


Figure shows right-handed tool.

(Grooving Tool Holder Example)



Notes: The symbols in the above table are compliant with ISO13399 and do not include symbols unique to our company. As symbols under review are not included, these may change over time.

(3) Cutters / Indexable Endmills

Symbol	Description
APMX	Depth Of Cut Maximum
BO	Body Diameter
BOX	Body Diameter Maximum
CBDP	Connection Bore Depth
CRKS	Connection Retention Knob Thread Size
CW	Cutting Width
DBC	Connection Bore Diameter
DC	Cutting Diameter
DCB	Clamping Diameter: Nominal. on Workpiece Side
OCON	Connection Diameter
DCSFMS	Contact Surface Diameter Machine Side
DCX	Cutting Diameter Maximum
DMM	Shank Diameter
ON	Neck Diameter
H	Shank Height
KDP	Groove Depth
KWW	Keyway Width
LBX	Body Length Maximum
LF	Functional Length
LH	Head Length
LS	Shank Length
LU	Usable Length
OAL	Overall Length
RMPX	Maximum Ramping Angle
THUB	Hub Thickness

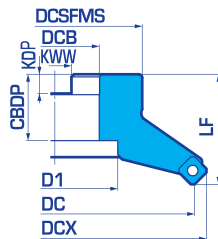
(4) Endmills

Symbol	Description
APMX	Depth Of Cut Maximum
CHW	Corner Chamfer Width
DC	Cutting Diameter
DMM	Shank Diameter
DN	Neck Diameter
LF	Functional Length
LFS	Functional Length Secondary
LU	Usable Length
RE	Corner Radius

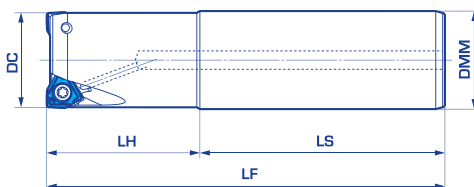
(5) Drills / Reamers

Symbol	Description
BD	Body Diameter
BOX	Body Diameter Maximum
CW	Cutting Width
DC	Cutting Diameter
DCB	Clamping Diameter: Nominal.on Workpiece Side
OCON	Connection Diameter
DCSFMS	Contact Surface Diameter Machine Side
DF	Flange Diameter
DMM	Shank Diameter
LBX	Body Length Maximum
LCF	Length Chip Flute
LF	Functional Length
LFA	A Dimension On Lf
LFS	Functional Length Secondary
LH	Head Length
LPR	Protruding Length
LS	Shank Length
LU	Usable Length
LUX	Usable Length Maximum
OAL	Overall Length
PL	Point Length
WBTHK	Web Thickness

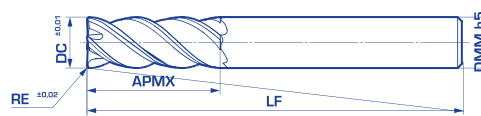
(Shell Type Example)



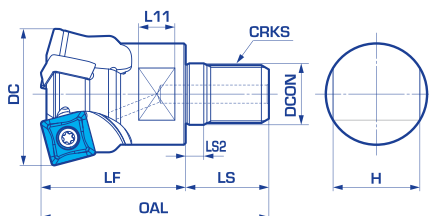
(Shank Type Example)



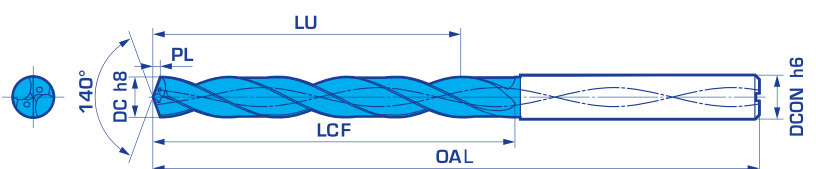
(Endmill Example)



(Modular Type Example)



(Drill Example)



Identification of ISO holders

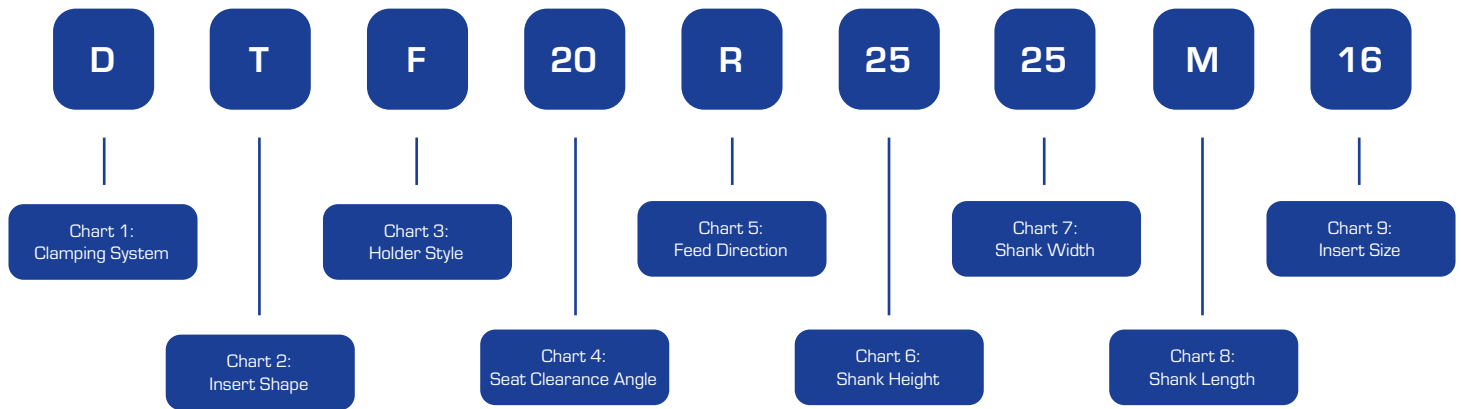


Chart 1: Clamping System


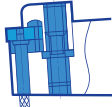
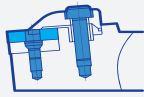
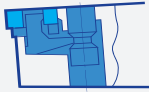
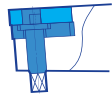

Clamping System					
Symbol	Clamp Types	Example of Structure	Symbol	Clamp Types	Example of Structure
C	Top Clamp		M	Top & Hole Clamp Type	
D	Double Clamp		P	Lever Lock Type (Insert is Supported by 1 face)	
E	Pin Lock Type (Insert is supported by 1 face)		S	Screw Clamp Type	

Chart 2: Insert Shape


















Insert Shape					
Symbol	Insert Shape		Symbol	Insert Shape	
A	Parallelogram 85°		M	Rhombic 86°	
B	Parallelogram 82°		O	Octagonal	
C	Diamond 80°		P	Pentagonal	
D	Diamond 55°		R	Round	
E	Diamond 75°		S	Square	
F	Diamond 50°		T	Triangular	
H	Hexagonal		V	Diamond 35°	
K	Parallelogram 55°		W	Trigon	
L	Rectangular				

Chart 3: Holder Style

Holder Style					
Symbol	Shape	Offset	Symbol	Shape	Offset
A		Nil	L		With Offset
B		Nil	N		Nil
D		Nil	R		With Offset
E		Nil	S		With Offset
F		With Offset	T		With Offset
G		With Offset	U		With Offset
J		With Offset	W		With Offset
K		With Offset	Y		With Offset

Chart 4: Seat Clearance Angle

Seat Clearance Angle	
Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special Angle

Chart 5: Feed Direction

Feed Direction					
Symbol	Right Hand Feed	Symbol	Neutral Feed	Symbol	Left Hand Feed
R		N		L	

Chart 6 Shank Height

Shank Height	
Symbol	Height (mm)
12	12
16	16
20	20
25	25
32	32
40	40
50	50
00	Round shank.

Chart 7 Shank Width

Shank Width	
Symbol	Width (mm)
12	12
16	16
20	20
25	25
32	32
40	40
50	50
	Shank Diameter is Shown for Round Shank.

Chart 8: Shank Length

Shank Length	
Symbol	Length (mm)
F	80
H	100
K	125
M	150
N	160
P	170
Q	180
S	250
T	300
U	350

For some Products, a Hyphen is used Instead of an alphabet.

Chart 9: Insert Size

Cutting Edge			
Symbol	Length (mm)	Symbol	Length (mm)
Eg. for Triangle Inserts:		For Round Inserts:	
06	6.9	10	10
08	8.2	12	12
09	9.6	16	16
11	11.0	20	20
16	16.5	25	25
22	22.0	32	32
27	27.5		
33	33.0		

2 digits are used for each dimension in mm.

Insert Identification Table

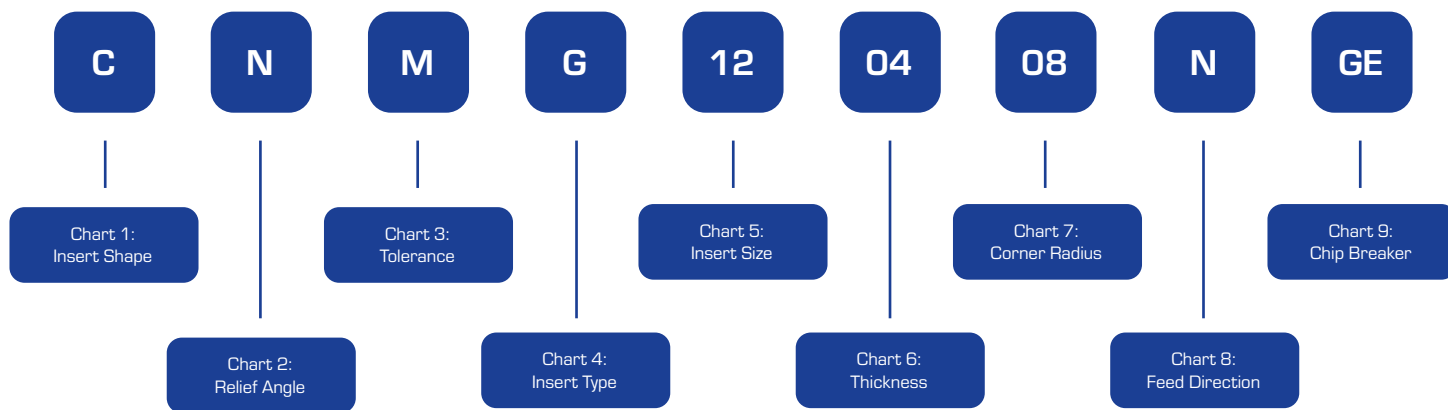


Chart 1: Insert Shape

Symbol	Insert Shape	Angle	
C		Diamond	
D			
E			
F			
V			
R		Round	-
S		Square	90°
T		Triangle	60°
W		Trigon	80°
A		Parallelogram	85°
B			82°
K			55°
H		Hexagonal	120°
O		Octogonal	135°
P		Pentagonal	108°
L		Rectangular	90°
M		Rhombic	86°

Chart 2: Relief Angle

Symbol	Relief Angle	
A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P*	11°	
O	Others	

*Inserts with a 10° relief angle are sometimes considered as "P"

Chart 3: Tolerance (mm)

Symbol	Nose Height	Inscribed Circle	Thickness
A	± 0.005	± 0.025	± 0.025
F	± 0.005	± 0.013	± 0.025
C	± 0.013	± 0.025	± 0.025
H	± 0.013	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.013
J*	± 0.005	±0.05 - ±0.15	± 0.025
K*	± 0.013	±0.05 - ±0.15	± 0.025
L*	± 0.025	±0.05 - ±0.15	± 0.025
M*	±0.08 - ±0.2	±0.05 - ±0.15	± 0.013
N*	±0.08 - ±0.2	±0.05 - ±0.15	± 0.025
U*	±0.13 - ±0.38	±0.08 - ±0.25	± 0.013

The height "m" on sharp corner.

Chart 4: Insert Hole or Breaker

Symbol	Hole	Hole Style	Chip Breaker	Shape	Symbol	Hole	Hole Style	Chip Breaker	Shape
N	No Hole	-	Nil		A	With Hole	Straight Hole	Nil	
R			One Face		M			One Face	
F			Both Faces		G			Both Faces	
W	With Hole	Straight hole with top end counter-sink (40°-60°)	Nil		B	With Hole	Straight hole with top end counter-sink (70°-90°)	Nil	
T			One Face		H			One Face	
Q	With Hole	Straight hole with top end counter-sink (40°-60°)	Nil		C	With Hole	Straight hole with top end counter-sink (70°-90°)	Nil	
U			Both Faces		J			Both Faces	
					X	-	-	-	Special

Chart 5: Cutting Edge Length (mm)

Shape	Symbol	Cutting Edge	Angle	Shape	Symbol	Cutting Edge	Inscribed Circle	Shape	Symbol	Cutting Edge Neg.	Pos.	Inscribed Circle Neg.	Pos.		
	03	3.55	3.50		07	7.7	6.35		03	3.8		5.56			
	04	4.97	4.30		09	9.7	7.94		04	4.3		6.35			
	06	6.4	6.35		11	11.6	9.525		05	5.4		7.94			
	08	8.0	7.94		15	15.5	12.70		06	6.5		9.525			
	09	9.7	9.525		19	19.4	15.875		08	8.7		12.70			
	12	12.9	12.70						10	10.9		15.875			
	16	16.1	15.875			08	8.3		4.76	11		4.3		6.35	
	19	19.3	19.05			09	9.7		5.56	16		6.5		9.525	
	25	25.8	25.4			11	11.1		6.35	08	8.0		8.0		
						16	16.6		9.525	10	10.0		10.0		
			22	22.1		12.7	12	12.0		12.0					
	06	6.35	6.35			06	6.9	3.97		12	12.70		12.70		
	S7	7.14	7.14			08	8.2	4.76		15	15.875		15.875		
	07	7.94	7.94			09	9.6	5.56		16	16.0		16.0		
	09	9.525	9.525			11	11.0	6.35		19	19.05		19.05		
	12	12.70	12.70			13	13.7	7.94		20	20.0		20.0		
	15	15.875	15.875		16	16.5	9.525	24		24.0		24.0			
	19	19.05	19.05		22	22.0	12.70	25		25.0		25.0			
	25	25.40	25.40		27	27.5	15.875	25		25.40		25.40			
	31	31.75	31.75		33	33.0	19.05	32		32.0		32.0			

Chart 6: Thickness

Symbol	Thickness (mm)
X1	*
01	159
02	238
T2	278
03	318
T3	397
04	476
05	556
06	635
07	794
09	952

[*]:
 CCETO3X1 Insert thickness: 1.40
 CCETO4X1 Insert thickness: 1.80

Chart 7: Nose Radius

Symbol	Nose Radius (mm)
00	Sharp Point
003	003
008	008
01	01
015	015
018	018
02	02
035	035
04	04
08	08
10	10
12	12
16	16
20	20
24	24
32	32
MO	Round Insert (Metric)
OO	Round Insert (Imperial)

An "M" after the nose radius indicates a negative tolerance
 Example:
 CCG T09T302 M NSI AC520U

Chart 8: Feed Direction

Symbol	Direction
R	Right-hand
L	Left-hand
N	Neutral

Chart 9: Chip Breaker

Symbol	Process	Bumpy Type	Standard	Handed
F	Fine Finishing to Finishing	FA. FL. FE. FB. FC FK. FP		FT. FX. FZ FY. FW
S L	Light Cut	SE. SEW. SI. SC. SF. SP. SU. SX LU. LUW. LB		SD SDW ST
G U	General	GE. GU. GUW UG. UP US. UX	GZ UZ	UM
M	Rough	MP. MU. MX. ME	MC	MM HM
H	Heavy	HG. HP. HF	HU HW	

Other Specials	
Wide Chipbreaker	W
For Countersink	C
For Round insert	RD, RP, RX, RH
For Exotic Alloy	EF, EG, EX, EM
For Aluminium	AW, AG, AX, AY, LD, GD
For Hardened Steel	FV, LV, GH
For Carburized Layer Removal	SV
For Stainless Steel	EF, EG, EM

Tolerance of Nose Height (m-Class)

Inscribed Circle	Triangle	Square	80° Diamond	55° Diamond	35° Diamond	Round
635	± 0.08	± 0.08	± 0.08	± 0.11	-	-
9.525	± 0.08	± 0.08	± 0.08	± 0.11	± 0.16	
1.270	± 0.13	± 0.13	± 0.13	± 0.15		
15.875	± 0.15	± 0.15	± 0.15	± 0.18		
1.905	± 0.15	± 0.15	± 0.15	± 0.18		
2.540	± 0.18	± 0.18	± 0.18			
3.175	-	± 0.20				

Tolerance of Nose Height (m-Class)

Inscribed Circle	Triangle	Square	80° Diamond	55° Diamond	35° Diamond	Round
635	± 0.05	± 0.05	± 0.05	± 0.05	-	-
9.525	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05
1.270	± 0.08	± 0.08	± 0.08	± 0.08	-	± 0.08
15.875	± 0.10	± 0.10	± 0.10	± 0.10	-	± 0.10
1.905	± 0.10	± 0.10	± 0.10	± 0.10	-	± 0.10
2.540	± 0.13	± 0.13	± 0.13	-	-	± 0.10
3.175	-	± 0.15	-	-	-	± 0.12

Boring Tools Identifications

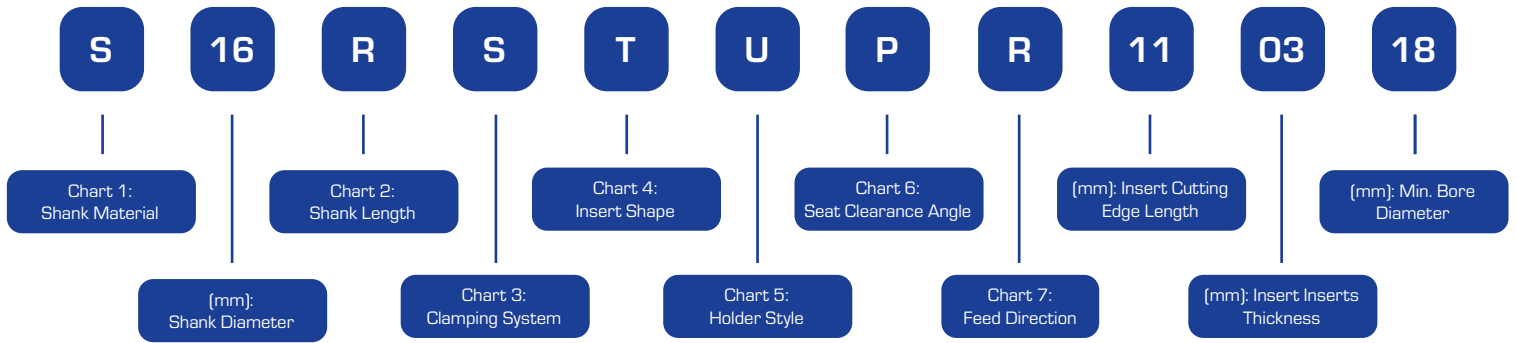


Chart 1 : Shank Material

Shank Material	
S	Steel
B	Steel with Anti-vibration Mechanism without Oil Hole
C	Steel with Anti-vibration Mechanism with Oil Hole
D	Carbide with Oil Hole
E	Carbide with Oil Hole

Chart 2: Shank Length

Shank Material	
Symbol	Length(mm)
F	80
G	90
H	100
J	110
K	125
L	140
M	150
N	160
P	170
Q	180
R	200
S	250
T	300
U	350
V	400
W	450

Chart 3: Clamping System

Clampina System		
Symbol	Clamp Types	System
C	Top Clamp	
D	Double Clamp	
E	Pin Lock Type (Insert is supported by 1 face)	
M	Top & Hole Clamp Type	
P	Lever Lock Type (Insert is Supported by 1 face)	
S	Screw Clamp Type	

Chart 4: Insert Shape


















Insert Shape			
Symbol	Insert Shape	Symbol	Insert Shape
A	Parallelogram 85° 	M	Rhombic 86° 
B	Parallelogram 82° 	O	Octagonal 
C	Diamond 80° 	P	Pentagonal 
D	Diamond 55° 	R	Round 
E	Diamond 75° 	S	Square 
F	Diamond 50° 	T	Triangular 
H	Hexagonal 	V	Diamond 35° 
K	Parallelogram 55° 	W	Trigon 
L	Rectangular 		

Chart 5: Holder Style



















Holder Style					
Symbol	Shape	Offset	Symbol	Shape	Offset
A		Nil	N		Nil
B		Nil	Q	107.5° 	With Offset
D		Nil	R		With Offset
E		Nil	S		With Offset
F		With Offset	T		With Offset
G		With Offset	U		With Offset
J		With Offset	W		With Offset
K		With Offset	Y		With Offset
L		With Offset	Z	93° 	With Offset

Chart 6: Seat Clearance Angle










Seat Clearance Angle										
Symbol	A	B	C	D	E	F	G	N	P	O
Relief Angle	3° 	5° 	7° 	15° 	20° 	25° 	30° 	0° 	11° 	Special Angle

Chart 7: Feed Direction

Feed Direction	
Symbol	Feed Direction
R	Right Hand Feed
L	Left Hand Feed
N	Neutral Feed

Position of Cutting Point

Cutting Edge Dimensions by Corner Radius : (This table shows X and Y dimensions based on 0° approach angle cutting edge inclinations)

Holders			Dimensions(mm)			Holders			Dimensions(mm)		
Symbol	Shapes	Corner Shapes	RE	X	Y	Symbol	Shapes	Corner Shapes	RE	X	Y
A			0.4	0.291	-	K			0.4	0.024	0.089
			0.8	0.581	-				0.8	0.048	0.178
			1.2	0.872	-				1.2	0.072	0.268
			1.6	1.162	-				1.6	0.096	0.357
			2.4	1.743	-				2.4	0.143	0.535
B			0.4	0.089	0.024	L			0.4	0.040	0.040
			0.8	0.178	0.048				0.8	0.079	0.079
			1.2	0.268	0.072				1.2	0.119	0.119
			1.6	0.357	0.096				1.6	0.159	0.159
			2.4	0.535	0.143				2.4	0.238	0.238
D			0.4	0.164	0.164	N			0.4	0.463	0.263
			0.8	0.329	0.329				0.8	0.925	0.471
			1.2	0.493	0.493				1.2	1.388	0.707
			1.6	0.658	0.658				1.6	1.850	0.943
			2.4	0.986	0.986				2.4	2.776	1.414
E			0.4	0.396	0.229	S			0.4	0.164	0.164
			0.8	0.793	0.458				0.8	0.329	0.329
			1.2	1.190	0.687				1.2	0.493	0.493
			1.6	1.587	0.916				1.6	0.658	0.658
			2.4	2.381	1.374				2.4	0.986	0.986
F			0.4	-	0.291	T			0.4	0.396	0.229
			0.8	-	0.581				0.8	0.793	0.458
			1.2	-	0.872				1.2	1.190	0.687
			1.6	-	1.162				1.6	1.587	0.916
			2.4	-	1.743				2.4	2.381	1.374
G			0.4	0.291	-	U			0.4	0.253	0.058
			0.8	0.581	-				0.8	0.506	0.116
			1.2	0.872	-				1.2	0.759	0.175
			1.6	1.162	-				1.6	1.013	0.233
			2.4	1.743	-				2.4	1.519	0.350
J			0.4	0.344	0.033	Y			0.4	0.002	0.033
			0.8	0.687	0.079				0.8	0.005	0.066
			1.2	1.031	0.118				1.2	0.008	0.099
			1.6	1.375	0.157				1.6	0.011	0.132
			2.4	2.062	0.236				2.4	0.017	0.198

Figures of „A“ and „RE“ to calculate Figure „B“

I.C. size (inch)	„A“ dimensions (mm)	
-	5/32	3.9688
-	6/32	4.7625
-	7/32	5.5562
2/8	8/32	6.3500
-	{0}	7.9375
3/8	-	9.5250
4/8	-	12.7000
5/8	-	15.8750
6/8	-	19.0500
8/8	-	25.4000

Figures of „A“ and „RE“ to calculate Figure „B“

Nose symbol	Size (inch)	„RE“ dimension (mm)
02	{0}	0.203
04	1/64	0.397
08	2/64	0.794
12	3/64	1.191
16	4/64	1.588
24	6/64	2.389

Calculation of the Nose Radius Dimensions (Unit in mm)

Insert Shape	Calculation
Triangle	$B = \frac{3}{2}A - RE$
Square	$B = (\sqrt{2}-1) \times (\frac{A}{2} - RE)$
Rhombic	$B = (\frac{1}{\sin(\theta/2)} - 1) \times (\frac{A}{2} - RE)$