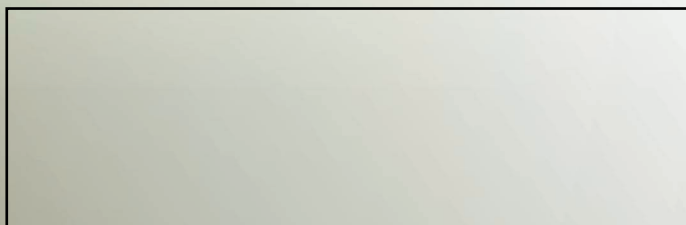


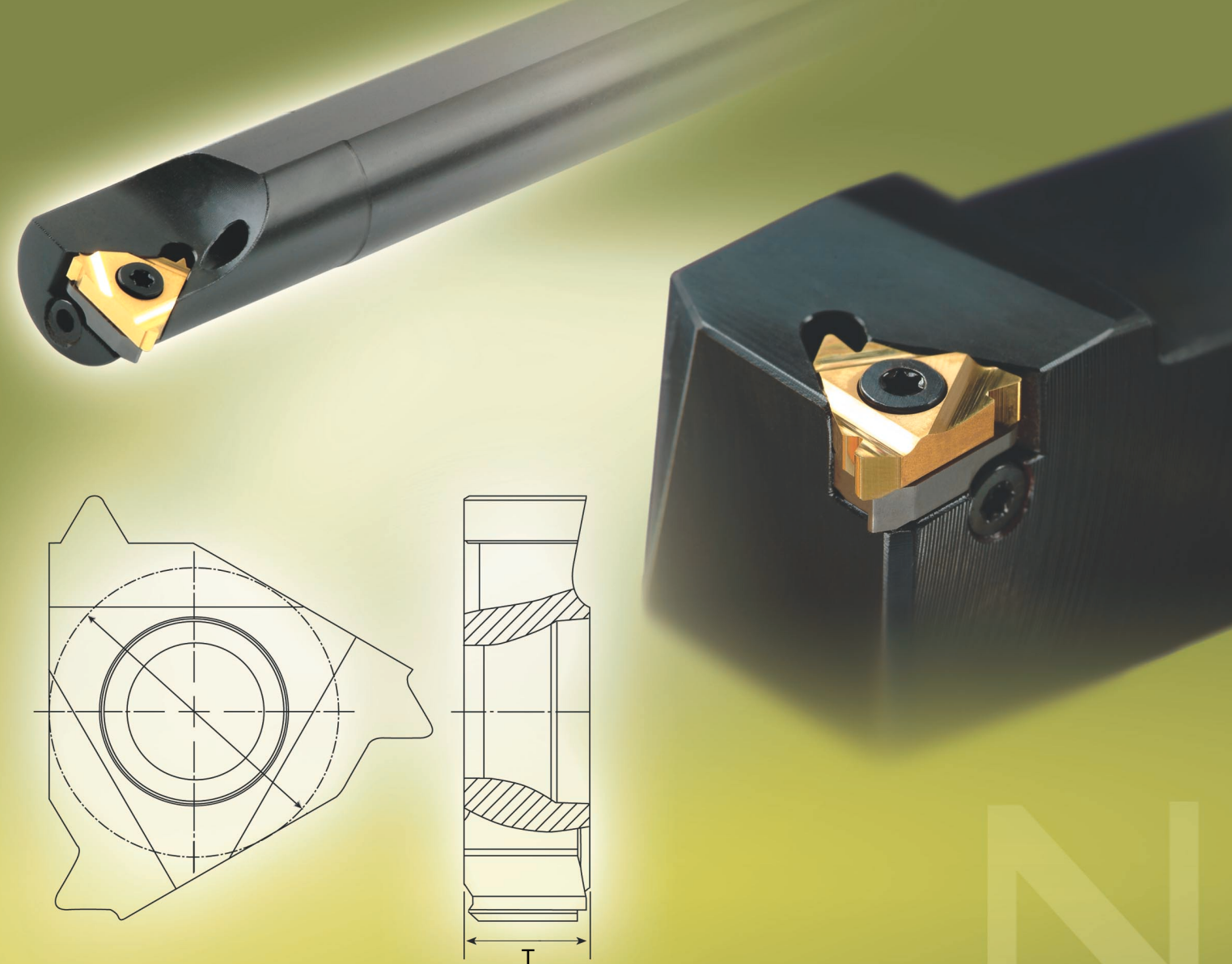


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Carmex Type Z Metric 07/2007



Type Z

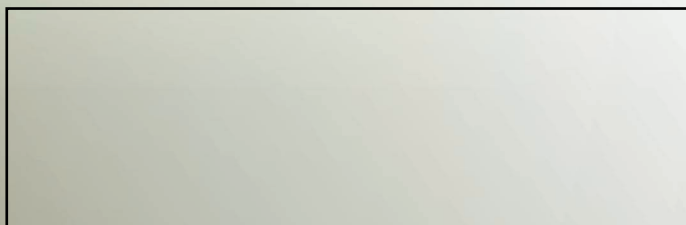
Thick Threading Inserts



Metric
2007-8

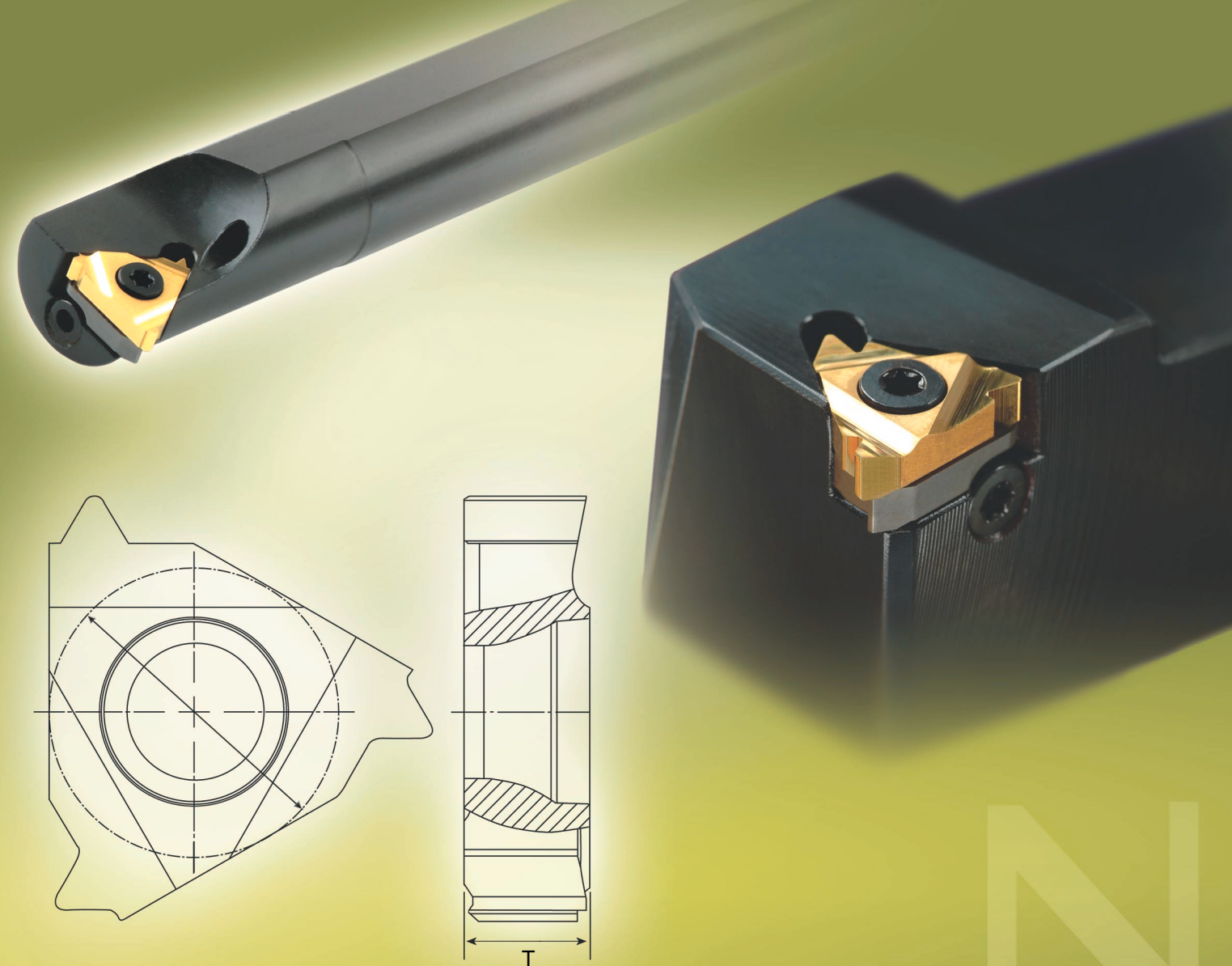


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Carmex Type Z Metric 07/2007



Type Z

Thick Threading Inserts



Carmex
Precision Tools Ltd.

Metric
2007-8

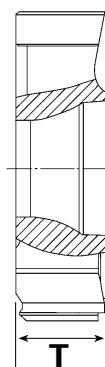
Carmex presents a unique line of **Thick** Thread Turning Inserts



- Three insert sizes: 11mm (1/4"), 16mm (3/8"), 22mm (1/2").
- Available in two coated grades: BMA or MXC.
- Manufactured in a wide range of threads.

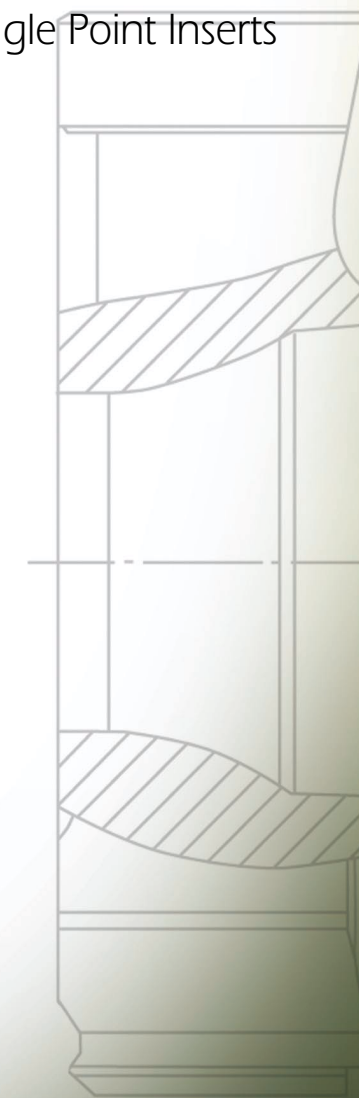
Insert Thickness

Insert Size		Insert Thickness
L	I.C. in	T
11	1/4	3.32
16	3/8	4.10
22	1/2	5.76

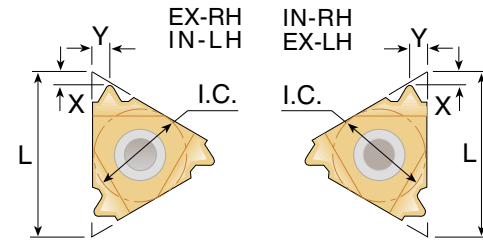
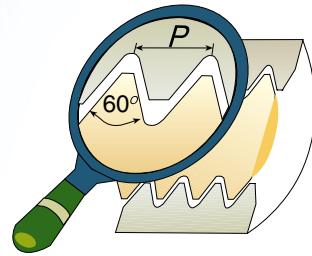


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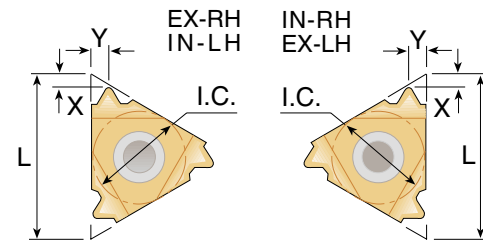
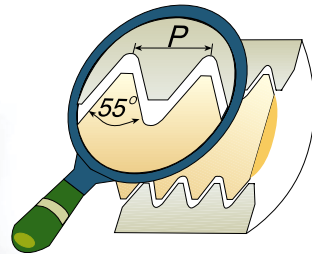
Partial Profile 60°



L	I.C. in	Pitch Range mm TPI	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y
11	1/4	0.5 -1.5 48-16		11 IR Z A60	0.8	0.9
11	1/4	1.0 -2.0 24-12		11 IR Z AG60	0.8	0.9
16	3/8	0.5 -1.5 48-16	16 ER Z A60	16 IR Z A60	1.2	0.9
16	3/8	1.75 -3.0 14 - 8	16 ER Z G60	16 IR Z G60	1.2	1.7
16	3/8	0.5 -3.0 48 - 8	16 ER Z AG60	16 IR Z AG60	1.2	1.7
22	1/2	3.5 -6.0 7 - 4	22 ER Z N60	22 IR Z N60	0.4	2.9

Order example: 16 ER Z G60 BMA

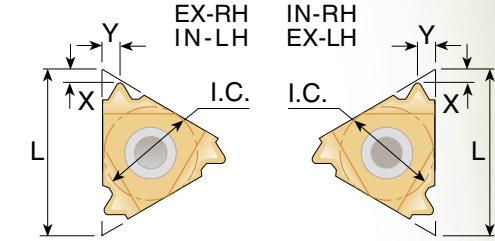
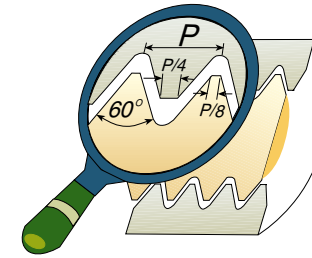
Partial Profile 55°



L	I.C. in	Pitch Range mm TPI	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y
11	1/4			11 IR Z A55	0.8	0.9
11	1/4			11 IR Z AG55	0.8	0.9
16	3/8	0.5 -1.5 48-16	16 ER Z A55	16 IR Z A55	1.2	0.9
16	3/8	1.75 -3.0 14 - 8	16 ER Z G55	16 IR Z G55	1.2	1.7
16	3/8	0.5 -3.0 48 - 8	16 ER Z AG55	16 IR Z AG55	1.2	1.7
22	1/2	7 - 4	22 ER Z N55	22 IR Z N55	0.1	2.9

Order example: 11 IR Z AG55 BMA

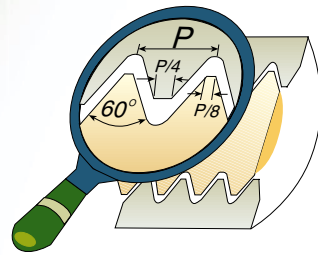
ISO - metric



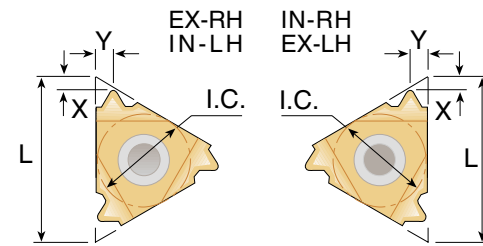
Pitch mm	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
0.5	11	1/4				11 IR Z 0.5 ISO	0.7	0.6
0.75	11	1/4				11 IR Z 0.75 ISO	0.7	0.6
1.0	11	1/4				11 IR Z 1.0 ISO	0.7	0.7
1.25	11	1/4				11 IR Z 1.25 ISO	0.7	0.8
1.5	11	1/4				11 IR Z 1.5 ISO	0.7	1.0
1.75	11	1/4				11 IR Z 1.75 ISO	0.7	1.1
2.0	11	1/4				11 IR Z 2.0 ISO	0.7	0.9
0.5	16	3/8	16 ER Z 0.5 ISO	1.3	0.6	16 IR Z 0.5 ISO	1.3	0.6
0.75	16	3/8	16 ER Z 0.75 ISO	1.3	0.6	16 IR Z 0.75 ISO	1.3	0.6
1.0	16	3/8	16 ER Z 1.0 ISO	1.3	0.7	16 IR Z 1.0 ISO	1.3	0.7
1.25	16	3/8	16 ER Z 1.25 ISO	1.3	0.9	16 IR Z 1.25 ISO	1.3	0.9
1.5	16	3/8	16 ER Z 1.5 ISO	1.3	1.0	16 IR Z 1.5 ISO	1.3	1.0
1.75	16	3/8	16 ER Z 1.75 ISO	1.3	1.2	16 IR Z 1.75 ISO	1.3	1.2
2.0	16	3/8	16 ER Z 2.0 ISO	1.3	1.3	16 IR Z 2.0 ISO	1.3	1.3
2.5	16	3/8	16 ER Z 2.5 ISO	1.3	1.5	16 IR Z 2.5 ISO	1.3	1.5
3.0	16	3/8	16 ER Z 3.0 ISO	1.3	1.6	16 IR Z 3.0 ISO	1.3	1.5
3.5	22	1/2	22 ER Z 3.5 ISO	1.7	2.3	22 IR Z 3.5 ISO	1.6	2.3
4.0	22	1/2	22 ER Z 4.0 ISO	1.7	2.3	22 IR Z 4.0 ISO	1.6	2.3
4.5	22	1/2	22 ER Z 4.5 ISO	1.7	2.4	22 IR Z 4.5 ISO	1.6	2.4
5.0	22	1/2	22 ER Z 5.0 ISO	1.4	2.5	22 IR Z 5.0 ISO	1.4	2.3
5.5	22	1/2	22 ER Z 5.5 ISO	1.1	2.6	22 IR Z 5.5 ISO	1.1	2.3
6.0	22	1/2	22 ER Z 6.0 ISO	0.9	2.7	22 IR Z 6.0 ISO	0.9	2.4

Order example: 16 IR Z 1.5 ISO BMA

UN - Unified



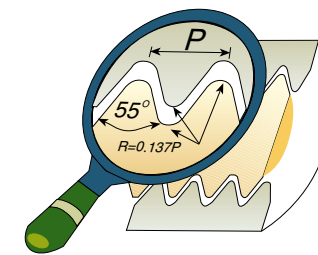
UNC, UNF, UNEF, UNS



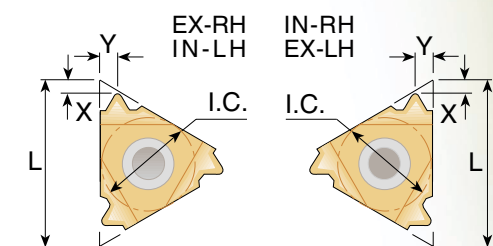
Pitch TPI	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
32	11	1/4				11 IR Z 32 UN	0.7	0.6
28	11	1/4				11 IR Z 28 UN	0.7	0.7
24	11	1/4				11 IR Z 24 UN	0.7	0.8
20	11	1/4				11 IR Z 20 UN	0.7	0.9
18	11	1/4				11 IR Z 18 UN	0.7	1.0
16	11	1/4				11 IR Z 16 UN	0.7	1.1
14	11	1/4				11 IR Z 14 UN	0.7	1.1
32	16	3/8	16 ER Z 32 UN	1.3	0.6	16 IR Z 32 UN	1.3	0.6
28	16	3/8	16 ER Z 28 UN	1.3	0.7	16 IR Z 28 UN	1.3	0.7
24	16	3/8	16 ER Z 24 UN	1.3	0.8	16 IR Z 24 UN	1.3	0.8
20	16	3/8	16 ER Z 20 UN	1.3	0.9	16 IR Z 20 UN	1.3	0.9
18	16	3/8	16 ER Z 18 UN	1.3	1.0	16 IR Z 18 UN	1.3	1.0
16	16	3/8	16 ER Z 16 UN	1.3	1.1	16 IR Z 16 UN	1.3	1.1
14	16	3/8	16 ER Z 14 UN	1.3	1.2	16 IR Z 14 UN	1.3	1.2
13	16	3/8	16 ER Z 13 UN	1.3	1.3	16 IR Z 13 UN	1.3	1.3
12	16	3/8	16 ER Z 12 UN	1.3	1.4	16 IR Z 12 UN	1.3	1.4
11	16	3/8	16 ER Z 11 UN	1.3	1.5	16 IR Z 11 UN	1.3	1.5
10	16	3/8	16 ER Z 10 UN	1.3	1.5	16 IR Z 10 UN	1.3	1.5
8	16	3/8	16 ER Z 8 UN	1.3	1.6	16 IR Z 8 UN	1.3	1.5
7	22	1/2	22 ER Z 7 UN	1.7	2.3	22 IR Z 7 UN	1.6	2.3
6	22	1/2	22 ER Z 6 UN	1.7	2.3	22 IR Z 6 UN	1.6	2.3
5	22	1/2	22 ER Z 5 UN	1.4	2.5	22 IR Z 5 UN	1.4	2.3
4.5	22	1/2	22 ER Z 4.5 UN	1.1	2.7	22 IR Z 4.5 UN	1.1	2.4
4	22	1/2	22 ER Z 4 UN	0.8	2.8	22 IR Z 4 UN	0.9	2.5

Order example: 22 IR Z 7 UN BMA

Whitworth - 55°



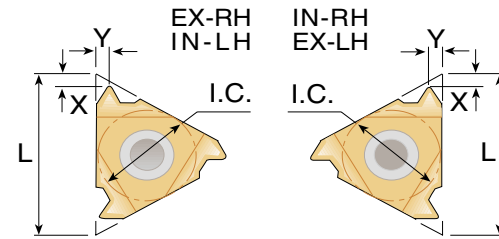
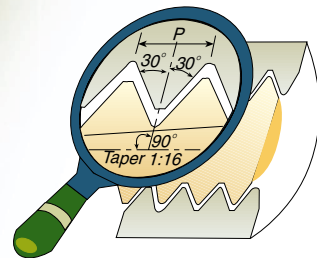
BSW, BSF, BSP, BSB



Pitch mm	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
20	11	1/4				11 IR Z 20 W	0.7	0.9
19	11	1/4				11 IR Z 19 W	0.7	1.0
14	11	1/4				11 IR Z 14 W	0.7	1.1
19	16	3/8	16 ER Z 19 W	1.3	1.0	16 IR Z 19 W	1.3	1.0
16	16	3/8	16 ER Z 16 W	1.3	1.1	16 IR Z 16 W	1.3	1.1
14	16	3/8	16 ER Z 14 W	1.3	1.2	16 IR Z 14 W	1.3	1.2
11	16	3/8	16 ER Z 11 W	1.3	1.5	16 IR Z 11 W	1.3	1.5
10	16	3/8	16 ER Z 10 W	1.3	1.5	16 IR Z 10 W	1.3	1.5
7	22	1/2	22 ER Z 7 W	1.7	2.3	22 IR Z 7 W	1.6	2.3
6	22	1/2	22 ER Z 6 W	1.7	2.3	22 IR Z 6 W	1.6	2.3
5	22	1/2	22 ER Z 5 W	1.4	2.4	22 IR Z 5 W	1.4	2.4
4.5	22	1/2	22 ER Z 4.5W	1.0	2.6	22 IR Z 4.5W	1.0	2.6
4	22	1/2	22 ER Z 4 W	0.6	2.9	22 IR Z 4 W	0.7	2.8

Order example: 16 ER Z 11W MXC

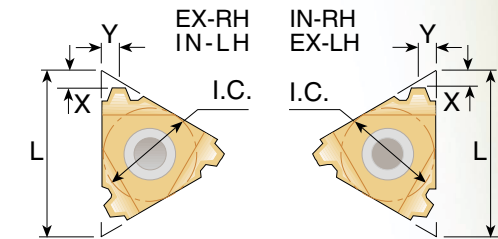
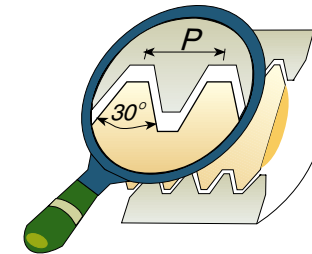
NPT



Pitch mm	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
18	11	1/4				11 IR Z 18 NPT	0.7	1.0
14	11	1/4				11 IR Z 14 NPT	0.7	1.0
27	16	3/8	16 ER Z 27 NPT	1.0	0.8	16 IR Z 27 NPT	1.0	0.8
18	16	3/8	16 ER Z 18 NPT	1.0	1.0	16 IR Z 18 NPT	1.0	1.0
14	16	3/8	16 ER Z 14 NPT	1.0	1.2	16 IR Z 14 NPT	1.0	1.2
11.5	16	3/8	16 ER Z 11.5 NPT	1.0	1.4	16 IR Z 11.5 NPT	1.0	1.4
8	16	3/8	16 ER Z 8 NPT	1.2	1.7	16 IR Z 8 NPT	1.2	1.7

Order example: 16 IR Z 11.5 NPT BMA

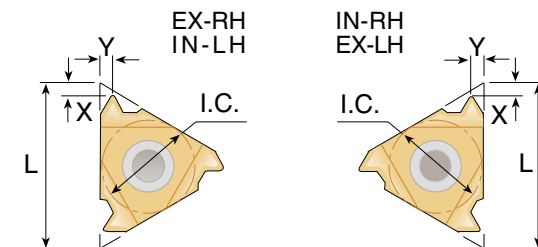
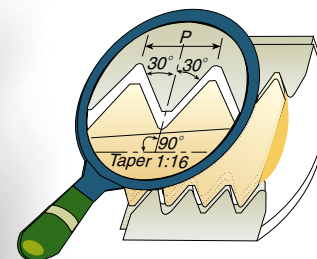
Trapez - DIN 103



Pitch mm	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
1.5	16	3/8	16 ER Z 1.5 TR	1.4	1.1	16 IR Z 1.5 TR	1.4	1.1
2.0	16	3/8	16 ER Z 2 TR	1.4	1.3	16 IR Z 2 TR	1.4	1.3
3.0	16	3/8	16 ER Z 3 TR	1.3	1.5	16 IR Z 3 TR	1.3	1.5
4.0	22	1/2	22 ER Z 4 TR	1.4	1.9	22 IR Z 4 TR	1.5	1.9
5.0	22	1/2	22 ER Z 5 TR	1.4	2.4	22 IR Z 5 TR	1.5	2.4
6.0	22	1/2	22 ER Z 6 TR	0.8	2.3	22 IR Z 6 TR	0.8	2.3
7.0	22	1/2	22 ER Z 7 TR	0.8	2.6	22 IR Z 7 TR	1.0	2.6

Order example: 22 ER Z 4 TR BMA

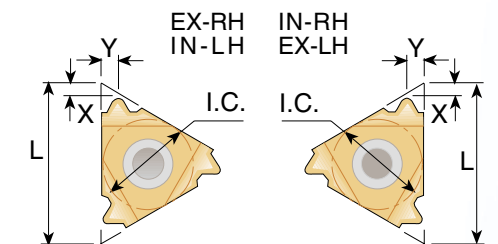
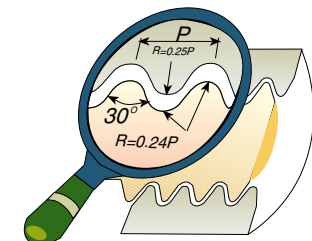
BSPT



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y
28	16	3/8	16 ER Z 28 BSPT	16 IR Z 28 BSPT	1.3	0.6
19	16	3/8	16 ER Z 19 BSPT	16 IR Z 19 BSPT	1.3	0.9
14	16	3/8	16 ER Z 14 BSPT	16 IR Z 14 BSPT	1.3	1.2
11	16	3/8	16 ER Z 11 BSPT	16 IR Z 11 BSPT	1.3	1.5

Order example: 16 ER Z 14 BSPT MXC

Round - DIN 405



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code Right Hand	X	Y	INTERNAL Ordering Code Right Hand	X	Y
10	16	3/8	16 ER Z 10 RD	1.3	1.2	16 IR Z 10 RD	1.3	1.2
8	16	3/8	16 ER Z 8 RD	1.3	1.3	16 IR Z 8 RD	1.3	1.4
6	16	3/8	16 ER Z 6 RD	1.4	1.7	16 IR Z 6 RD	1.4	1.5
4	22	1/2	22 ER Z 4 RD	1.4	2.3	22 IR Z 4 RD	1.4	2.3

Order example: 16 IR Z 8 RD BMA

- * Other Profiles are available per request
- * The type-Z inserts do not fit carmex tool holders from the SER, SIR, DER or DIR types.

Thread Turning Technical Section

Carbide Grade Selection

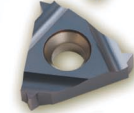
Choose the CARMEX grade specifically formulated for your application

MXC
(K10-K20)
(P10-P25)



PVD TiN coated micrograin for free cutting untreated alloy steels (below 30 HRC), for stainless steels and cast iron.

BMA
(P20-P40)
(K20-K30)



PVD TiAlN coated sub-micrograin grade for stainless steels and exotic materials at medium to high cutting speeds.

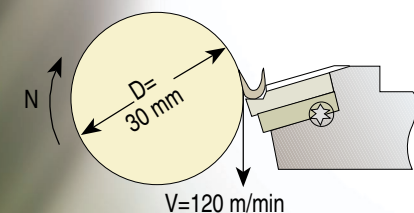
Note: Due to our unique and specialized production techniques, CARMEX coated inserts provide superior cutting performances and exceptionally long tool life.

Recommended cutting speed (m/min) for thread turning inserts

ISO Standard	Materials	MXC	BMA
P	Steel: Low & Medium Carbon Steels	100-180	90-160
	High Carbon Steels	80-160	80-150
	Alloy Steels, Treated Steels	80-120	80-120
	Cast Steel	120-160	100-140
M	Stainless steel: Cast steels Stainless austenitic and austenitic ferritic steel and cast steel	90-120	70-130
K	Cast iron: Grey cast iron, cast iron with spherical graphite, malleable cast iron	80-150	80-130
N	Nonferrous Metal: Aluminium and other nonferrous metals, copper alloys non metallic	300-600	300-800
S	Super-alloys and Titanium: Heat resistant special alloys based on iron, nickel and cobalt, titanium and titanium alloys	40-80	40-100
H	Hard Materials: Hardened steel, hardened cast iron materials, chilled cast iron	20-40	20-50

Conversion of Cutting Speed to Rotational Speed

Conversion of a selected cutting speed to rotational speed is calculated by the following formula:



Example

$$N = \frac{V \times 1000}{\pi \times D} = \frac{120 \times 1000}{3.14 \times 30} = 1274 \text{ RPM}$$

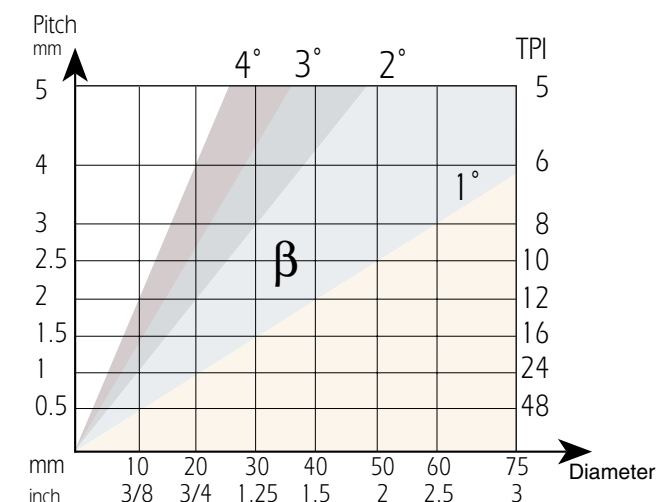
Number of threading passes selection for single point inserts

Pitch:	mm TPI	0.5 48	0.8 32	1.0 24	1.25 20	1.5 16	1.75 14	2.0 12	2.5 10	3.0 8	4.0 6	6.0 4
Number of Passes		3-6	4-7	4-9	6-10	5-11	9-12	6-13	7-15	8-17	10-20	11-22

NOTES:

- For most standard applications the middle of the range is a good starting point.
- For most materials, the tougher the material, the higher the number of cutting passes you should select.
- As a general rule of thumb, less passes are better than more speed.

Thread Helix Angle



$$\tan \beta = \frac{P}{\pi \times D}$$

Simplified formula
 $\beta = 20P/D$

Example:

D = 30 mm (1.18 ")
P = 1.5 mm (16 TPI)

$$\beta = \frac{20 \times 1.5}{30} = 1^\circ$$

