NICHE

FOR A BETTER US

THREADING

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3.0
ISO

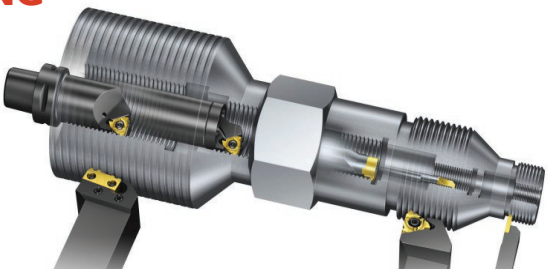

IR

CONTENTS

THREADING INSERTS

THREAD TURNING

Thread turning tools makes a number of passes to generate a thread on the workpiece. Avoid overloading the insert by dividing the full cutting depth of the thread into a series of small cuts.



CODE KEY

16 ER AG 60

INSERT SIZE

22	Inscribed Circle φ.500"
16	Inscribed Circle φ.375"
11	Inscribed Circle φ.250"

CUTTING TYPE

ER	External
IR	Internal

PITCH WIDTH

A	0.019-0.059	48-16
AG	0.019-0.118	48-8
G	0.069-0.118	14-8
N	0.138-0.197	7-5
Q	0.217-0.236	41/2-4

THREAD PROFILE

60	60° General Pitch Threads
55	55° General Pitch Threads
W	Whitworth Threads
ISO	ISO Metric Threads
NPT	American Standard Taper Pipe Threads
BSPT	British Standard Taper Pipe Threads
RD	API Round
UN	American Standard Unified Threads

NP5330
Special PVD coating provides better heat resistance and adhesion resistance.

WORKPIECE MATERIAL P ☑ M ☑ K ☑

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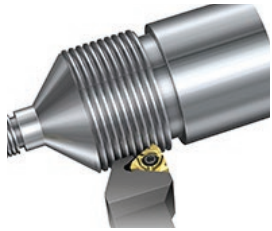
EXTERNAL THREAD TURNING

External thread turning is often easier and less demanding on the tool than internal thread turning and there are a number of different methods which can be used to achieve the desired results.

Considerations for external thread turning:

- Feed rate must be equal to the pitch of the thread
- Plan the number of passes and depth of cuts
- Chip formation (Avoid chips clogging around the tool or components
- Avoid vibration caused by long tool overhangs and slender components
- Tool alignment and centre height



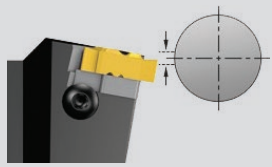
INTERNAL THREAD TURNING

Internal thread turning is more demanding than external thread turning, due to high need of efficient chip evacuation and that the tools often need to be longer and more slender.

Considerations for internal thread turning:

- Chip evacuation, especially in blind holes, is helped by using left-hand tools for right-hand threads and vice versa (pull-threading). However, this also creates higher risk of insert movement
- Use modified flank infeed to generate a spiral chip, which is easy to guide towards the entry of the bore
- Choose an adequate number of thread cutting passes and depth of cuts
- Avoid vibration caused by long tool overhangs
- Tool alignment and centre height
- If a long tool is needed for reach, use a carbide or dampened tool to minimize vibrations

Tool alignment and centre height is important for a good threading process



GET THE BEST THREADING RESULTS

Select thread machining method.

Calculate helical angle, select shim.

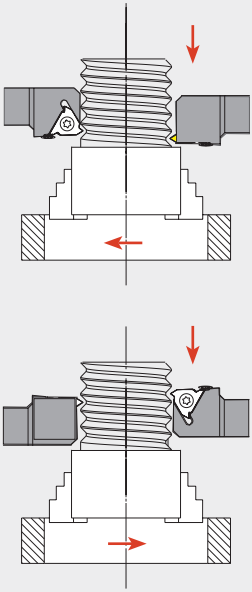
Choose insert and toolholder size.

Select cutting parameters.

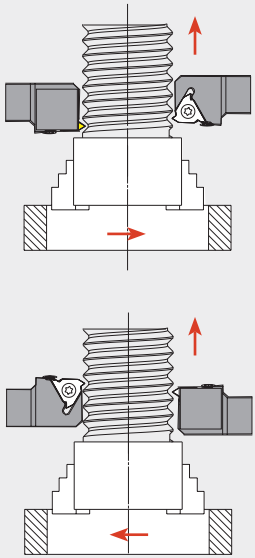
Select feed way.

EXTERNAL THREADING MACHINING

LEFT HAND THREAD

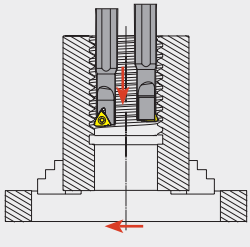


RIGHT HAND THREAD

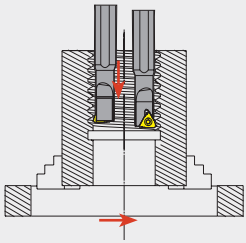


INTERNAL THREADING MACHINING

LEFT HAND THREAD

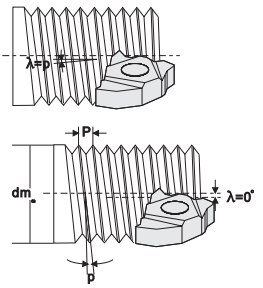


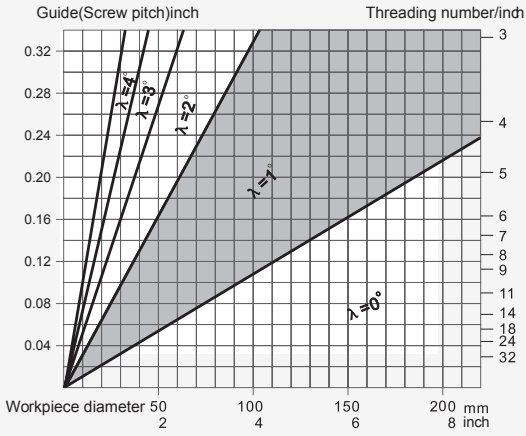
RIGHT HAND THREAD



HELICAL ANGLE & SHIM

The cutting edge clearance angle affects the dissipation of heat, insert wear, thread pitch quality, and cuttting edge. The clearance angle of thread pitch on clearance face is determined by thread helical angle. These two angles are similar to each other. If the inclined angle of the insert is different from the helical angle, then clearance angle won't be the same.The pitch of the helical angle must be the same as the inclined angle of the insert in order to prevent premature wear on the clearance face.





SCREW PITCH RANGE	INSERT DIMENSIONS	INCLINED ANGLE	SHIM
0.5-3.0	16	0	MT16-00M
		1	MT16-01M
		2	MT16-02M
		3	MT16-03M
3.5-6.0	22	0	MT22-00M
		1	MT22-01M
		2	MT22-02M
		3	MT22-03M

CALCULATE A HELICAL ANGLE

$$\rho = \arctan \frac{p}{d_2 \times \pi}$$

P=Pitch
d_2=pitch diameter

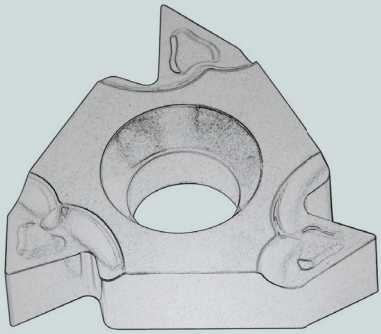
The common inclined angel is 1°, MT standard shim and its inclined angle is 1° too

CALCULATE THE CLEARANCE ANGLE

$$\beta = \alpha rc(\tan\theta \times \tan\alpha)$$

2Θ=Thread profile angle
α=The rake angle of external standard threading tools is 10°; The rake angle of internal standard threading tools is 15°
The shim has to be changed when helical angle of thread is ≤ clearance angle of the insert, which would cause interference with insert flank.Please change shim to adjust the difference between helical angle of thread and inclined angle of shim to be within 2°~0°.

PARTIAL 60°



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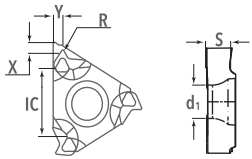
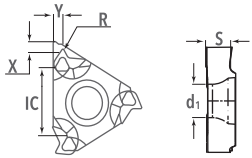
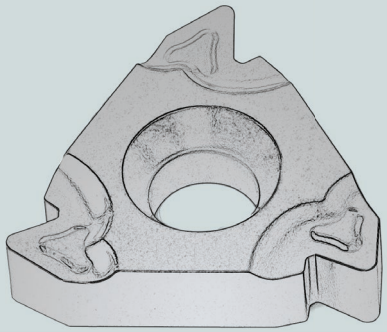


Part No.	PITCH		Dimension (mm)					
	TPI	mm	X	Y	R	IC	S	d1
16ERA60	48-16	0.5-1.5	0,8	0,9	0,08	9,525	3,47	4
16ERAG60	48-8	0.5-3.0	1,1	1,5	0,08	9,525	3,47	4
16ERG60	14-8	1.75-3.0	1,2	1,7	0,25	9,525	3,47	4
22ERN60	7-5	3.5-5.0	1,7	2,5	0,51	12,7	4,71	5

INTERNAL

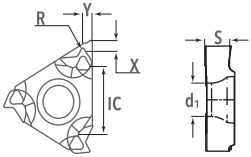


Part No.	PITCH		Dimension (mm)					
	TPI	mm	X	Y	R	IC	S	d1
08IRA60	48-16	0.5-1.5	0,6	0,7	0,08	5,00	2,25	2,68
11IRA60	48-16	0.5-1.5	0,8	0,9	0,08	6,35	3,00	3,2
16IRA60	48-16	0.5-1.5	0,8	0,9	0,08	9,525	3,47	4
16IRAG60	48-8	0.5-3.0	1,1	1,5	0,08	9,525	3,47	4
16IRG60	14-8	1.75-3.0	1,2	1,7	0,13	9,525	3,47	4
22IRN60	7-5	3.5-5.0	1,7	2,5	0,25	12,7	4,71	5



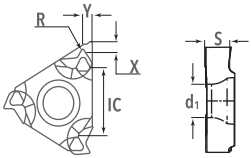
PARTIAL 55°

EXTERNAL



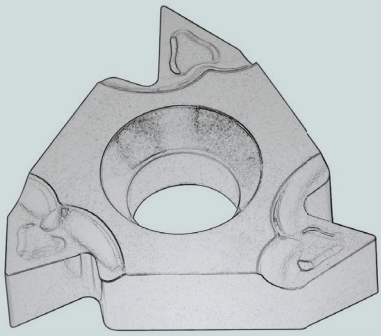
Part No.	PITCH		Dimension (mm)					
	TPI	mm	X	Y	R	IC	S	d1
16ERA55	48-16	0.5-1.5	0,8	0,9	0,08	9,525	3,47	4
16ERAG55	48-8	0.5-3.0	1,1	1,5	0,08	9,525	3,47	4
16ERG55	14-8	1.75-3.0	1,2	1,7	0,21	9,525	3,47	4
22ERN55	7-5	3.5-5.0	1,7	2,5	0,44	12,7	4,71	5

INTERNAL



Part No.	PITCH		Dimension (mm)					
	TPI	mm	X	Y	R	IC	S	d1
11IRA55	48-16	0.5-1.5	0,8	0,9	0,08	6,35	3	3,2
16IRA55	48-16	0.5-1.5	0,8	0,9	0,08	9,525	3,47	4
16IRAG55	48-8	0.5-3.0	1,1	1,5	0,08	9,525	3,47	4
16IRG55	14-8	1.75-3.0	1,2	1,7	0,21	9,525	3,47	4
22IRN55	7-5	3.5-5.0	1,7	2,5	0,44	12,7	4,71	5

ISO METRIC



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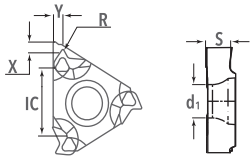
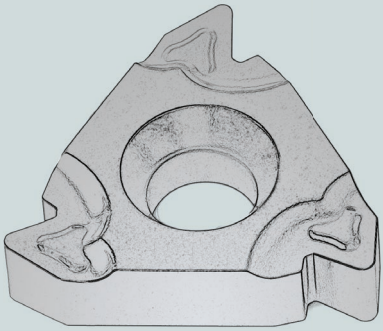
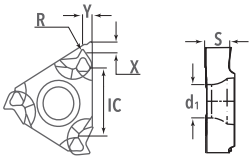


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER1.00ISO	1,00	0,8	0,7	0,14	9,525	3,47	4
16ER1.25ISO	1,25	0,8	0,9	0,18	9,525	3,47	4
16ER1.50ISO	1,50	0,8	1.0	0,22	9,525	3,47	4
16ER1.75ISO	1,75	1,2	1,2	0,25	9,525	3,47	4
16ER2.00ISO	2,00	1,2	1,3	0,29	9,525	3,47	4
16ER2.50ISO	2,50	1,2	1,5	0,36	9,525	3,47	4
16ER3.00ISO	3,00	1,2	1,5	0,43	9,525	3,47	4
22ER3.50ISO	3,50	1,6	2,3	0,45	12,7	4,71	5
22ER4.00ISO	4,00	1,6	2,3	0,52	12,7	4,71	5
22ER4.50ISO	4,50	1,7	2,4	0,58	12,7	4,71	5
22ER5.00ISO	5,00	1,7	2,5	0,63	12,7	4,71	5
22ER5.50ISO	5,50	1,9	2,7	0,72	12,7	4,71	5
22ER6.00ISO	6,00	1,9	2,7	0,78	12,7	4,71	5



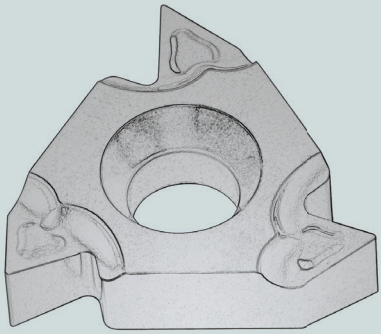
ISO METRIC



INTERNAL

Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
11IR1.00ISO	1,00	0,8	0,7	0,07	6,35	3,00	3,2
11IR1.25ISO	1,25	0,8	0,9	0,09	6,35	3,00	3,2
11IR1.50ISO	1,50	0,8	1,0	0,11	6,35	3,00	3,2
11IR1.75ISO	1,75	0,9	1,1	0,13	6,35	3,00	3,2
11IR2.00ISO	2,00	0,9	1,1	0,15	6,35	3,00	3,2
16IR1.00ISO	1,00	0,8	0,7	0,07	9,525	3,47	4
16IR1.25ISO	1,25	0,8	0,9	0,09	9,525	3,47	4
16IR1.50ISO	1,50	0,8	1,0	0,11	9,525	3,47	4
16IR1.75ISO	1,75	1,2	1,2	0,13	9,525	3,47	4
16IR2.00ISO	2,00	1,2	1,3	0,15	9,525	3,47	4
16IR2.50ISO	2,50	1,2	1,5	0,18	9,525	3,47	4
16IR3.00ISO	3,00	1,2	1,5	0,22	9,525	3,47	4
22IR3.50ISO	3,50	1,6	2,3	0,22	12,7	4,71	5
22IR4.00ISO	4,00	1,6	2,3	0,25	12,7	4,71	5
22IR4.50ISO	4,50	1,6	2,4	0,28	12,7	4,71	5
22IR5.00ISO	5,00	1,6	2,3	0,32	12,7	4,71	5
22IR5.50ISO	5,50	1,6	2,3	0,36	12,7	4,71	5
22IR6.00ISO	6,00	1,6	2,4	0,39	12,7	4,71	5

AMERICAN UN60°



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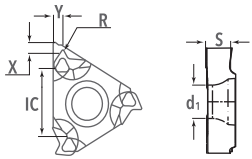
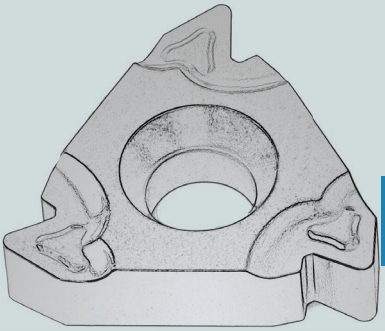
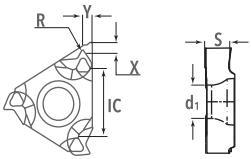


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER24UN	24	0,8	0,8	0,15	9,525	3,47	4
16ER20UN	20	0,8	0,9	0,18	9,525	3,47	4
16ER18UN	18	0,8	1,0	0,20	9,525	3,47	4
16ER16UN	16	0,9	1,1	0,23	9,525	3,47	4
16ER14UN	14	1,2	1,5	0,26	9,525	3,47	4
16ER12UN	12	1,2	1,5	0,31	9,525	3,47	4
16ER10UN	10	1,2	1,5	0,37	9,525	3,47	4
16ER8UN	8	1,3	1,7	0,46	9,525	3,47	4



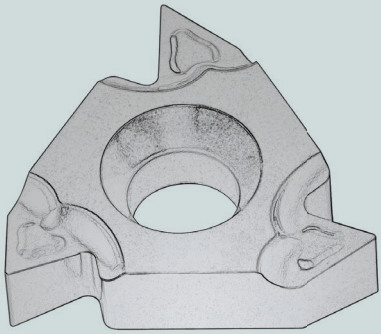
AMERICAN UN60°



INTERNAL

Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
11IR20UN	20	0,8	0,9	0,09	6,35	3,00	3,2
11IR18UN	18	0,8	1,0	0,10	6,35	3,00	3,2
16IR24UN	24	0,8	0,8	0,08	9,525	3,47	4
16IR20UN	20	0,8	0,9	0,09	9,525	3,47	4
16IR18UN	18	0,8	1,0	0,10	9,525	3,47	4
16IR16UN	16	0,9	1,1	0,12	9,525	3,47	4
16IR14UN	14	1,2	1,5	0,13	9,525	3,47	4
16IR12UN	12	1,2	1,5	0,16	9,525	3,47	4
16IR10UN	10	1,2	1,5	0,19	9,525	3,47	4
16IR8UN	8	1,3	1,7	0,23	9,525	3,47	4

WHITWORTH 55°



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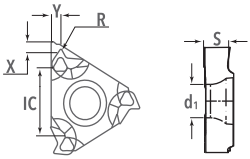
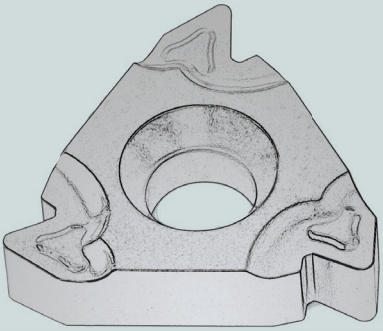
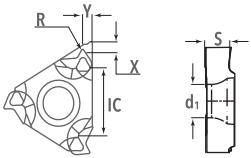


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER19W	19	0,8	1,0	0,17	9,525	3,47	4
16ER18W	18	0,8	1,0	0,18	9,525	3,47	4
16ER16W	16	0,9	1,1	0,20	9,525	3,47	4
16ER14W	14	1,2	1,5	0,24	9,525	3,47	4
16ER12W	12	1,2	1,5	0,28	9,525	3,47	4
16ER11W	11	1,2	1,5	0,30	9,525	3,47	4
16ER10W	10	1,1	1,5	0,34	9,525	3,47	4



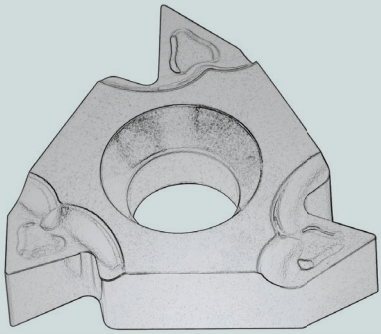
WHITWORTH 55°



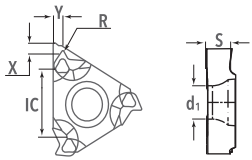
INTERNAL

Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
11IR19W	19	0,9	1,1	0,19	6,35	3,00	3,2
11IR14W	14	0,9	1,1	0,27	6,35	3,00	3,2
16IR19W	19	0,8	1,0	0,17	9,525	3,47	4
16IR18W	18	0,8	1,0	0,18	9,525	3,47	4
16IR16W	16	0,9	1,1	0,20	9,525	3,47	4
16IR14W	14	1,2	1,5	0,24	9,525	3,47	4
16IR12W	12	1,2	1,5	0,28	9,525	3,47	4
16IR11W	11	1,2	1,5	0,30	9,525	3,47	4
16IR8W	8	1,2	1,5	0,41	9,525	3,47	4

NPT 60°

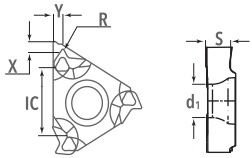


EXTERNAL

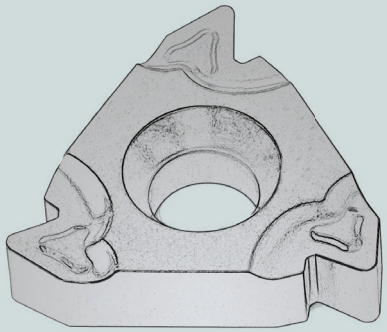


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER27NPT	27	0,7	0,8	0,13	9,525	3,47	4
16ER18NPT	18	0,8	1,0	0,20	9,525	3,47	4
16ER14NPT	14	1,2	1,5	0,22	9,525	3,47	4
16ER11.5NPT	11,5	1,2	1,5	0,25	9,525	3,47	4
16ER8NPT	8	1,3	1,8	0,30	9,525	3,47	4

INTERNAL

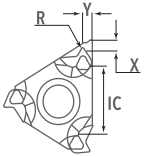


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
11IR18NPT.	18	0,8	1,0	0,20	6,35	3,00	3,2
16IR27NPT	27	0,7	0,8	0,13	9,525	3,47	4
16IR18NPT	18	0,8	1,0	0,20	9,525	3,47	4
16IR14NPT	14	1,2	1,5	0,22	9,525	3,47	4
16IR11.5NPT	11,5	1,2	1,5	0,25	9,525	3,47	4
16IR8NPT	8	1,3	1,8	0,30	9,525	3,47	4



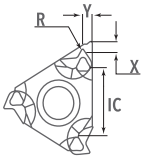
BSPT 55°

EXTERNAL



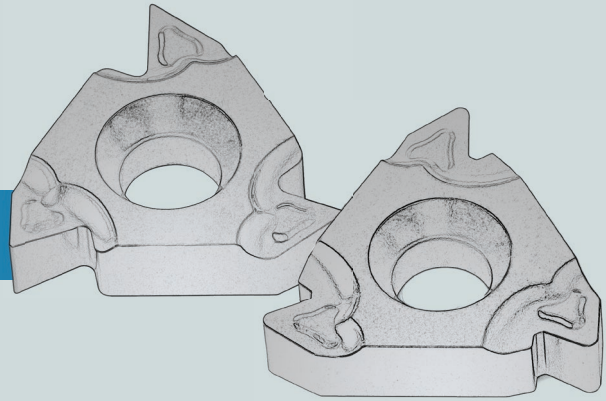
Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER28BSPT	28	0,7	0,8	0,11	9,525	3,47	4
16ER19BSPT	19	0,8	1,0	0,17	9,525	3,47	4
16ER14BSPT	14	1,2	1,5	0,24	9,525	3,47	4
16ER11BSPT	11	1,2	1,5	0,30	9,525	3,47	4

INTERNAL

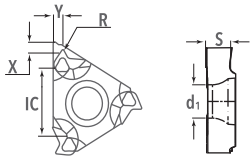


Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
11IR19BSPT	19	0,8	1,0	0,18	6,35	3,00	3,2
11IR14BSPT	14	0,9	1,1	0,24	6,35	3,00	3,2
16IR28BSPT	28	0,7	0,8	0,11	9,525	3,47	4
16IR19BSPT	19	0,8	1,0	0,17	9,525	3,47	4
16IR14BSPT	14	1,2	1,5	0,24	9,525	3,47	4
16IR11BSPT	11	1,2	1,5	0,30	9,525	3,47	4

API RD 30°

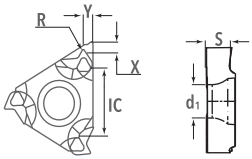


EXTERNAL



Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16ER10RD	10	1,1	1,2	0,60	9,525	3,47	4
16ER8RD	8	1,4	1,3	0,75	9,525	3,47	4
16ER6RD	6	1,4	1,5	1,00	9,525	3,47	4
22ER4RD	4	2,2	2,3	1,51	12,7	4,71	5

INTERNAL



Part No.	PITCH (mm)	Dimension (mm)					
		X	Y	R	IC	S	d1
16IR10RD	10	1,1	1,2	0,55	9,525	3,47	4
16IR8RD	8	1,4	1,3	0,70	9,525	3,47	4
16IR6RD	6	1,4	1,5	0,936	9,525	3,47	4
22IR4RD	4	2,2	2,3	1,40	12,7	4,71	5

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