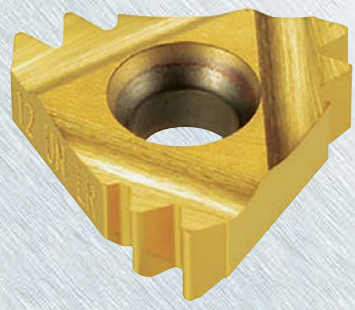
TOTHREAD™

Multi-Tooth Threading Inserts for Decreased Cycle Times

Multi-tooth thread turning inserts are designed to reduce the number of passes required when machining OD and ID threading applications on a lathe. This is achieved by utilizing multiple teeth (2-3) as opposed to standard single point thread turning inserts which utilize only one tooth.



Multi-Tooth Insert

Single-Point Insert

The first tooth is for roughing and semi-finishing which removes the majority of material. The last tooth is designed to finish the thread to the required dimensions according to the thread standard. Multiple teeth allow for a higher metal removal rate, in turn resulting in faster cycle times and overall cost savings.

Features and Benefits

- Increased productivity
- Reduced cycle times
- Longer tool life
- Improved surface finish
- Fewer number of passes required
- Tremendous cost savings
- Larger thread relief required to clear multiple teeth upon exit
- Not recommended for thin-walled applications due to tool pressure caused by multi-tooth inserts

Insert Sizes:
- 3/8" IC (16mm),
- 1/2" IC (22mm),
- 5/8" IC (27mm)

Insert Style:
- ER and IR Multitooth

Thread Forms:
- UN
- ISO
- NPT
- W (Whitworth)
- API RD

Applications:
- External RH
- Internal RH

Grade:
- TT9030
  PVD-TiAlN Submicron Grade

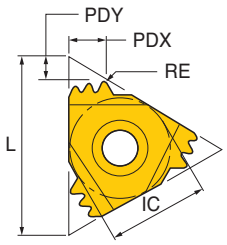
NEW PRODUCT ANNOUNCEMENT 2017

Member IMC Group Ingersoll Cutting Tools

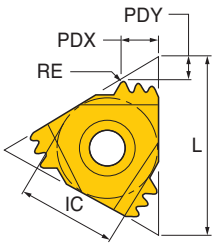
External & Internal ISO Metric

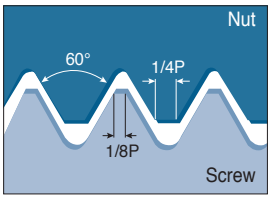
Full profile, multi-tooth

External right-hand shown



Internal right-hand shown





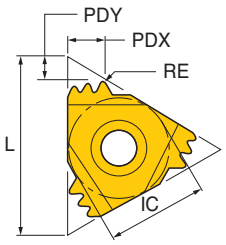
- Application: General industry

Insert	Part Number	TTP Thread Type	Hand	Insert Type	NT Tooth Count	IC Inscribed Circle	TP Thread Pitch	L Length	RE Radius	PDY Profile Dist. ey	PDX Profile Dist. ex	Grade TT9030
	16ER0.75ISO 3M	EXT	R	Regular	3	0.375	0.75	0.630	0.003	0.050	0.070	•
	16ER1.00ISO 3M	EXT	R	Regular	3	0.375	1.00	0.630	0.005	0.030	0.030	•
	16ER1.50ISO 2M	EXT	R	Regular	2	0.375	1.50	0.630	0.007	0.060	0.090	•
	16ER2.00ISO 2M	EXT	R	Regular	2	0.375	2.00	0.630	0.010	0.080	0.120	•
	22ER1.50ISO 3M	EXT	R	Regular	3	0.500	1.50	0.866	0.007	0.090	0.150	•
	22ER2.00ISO 2M	EXT	R	Regular	2	0.500	2.00	0.866	0.010	0.080	0.120	•
	22ER2.00ISO 3M	EXT	R	Regular	3	0.500	2.00	0.866	0.010	0.120	0.200	•
	27ER3.00ISO 2M	EXT	R	Regular	2	0.625	3.00	1.063	0.015	0.110	0.180	•
	16IR1.00ISO 3M	INT	R	Regular	3	0.375	1.00	0.630	0.002	0.070	0.100	•
	16IR1.50ISO 2M	INT	R	Regular	2	0.375	1.50	0.630	0.030	0.060	0.090	•
	16IR2.00ISO 2M	INT	R	Regular	2	0.375	2.00	0.630	0.005	0.080	0.120	•
	22IR1.50ISO 3M	INT	R	Regular	3	0.500	1.50	0.866	0.003	0.090	0.150	•
	22IR2.00ISO 2M	INT	R	Regular	2	0.500	2.00	0.866	0.003	0.080	0.120	•
	22IR2.00ISO 3M	INT	R	Regular	3	0.500	2.00	0.866	0.003	0.120	0.200	•
	27IR3.00ISO 2M	INT	R	Regular	2	0.625	3.00	1.063	0.007	0.110	0.180	•

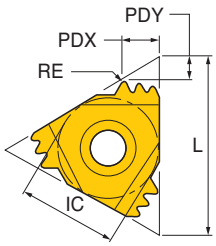
External & Internal American UN

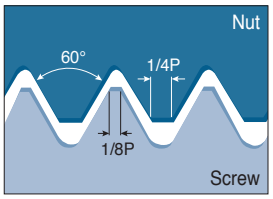
Full profile, multi-tooth, UN, UNC, UNF, UNEF

External right-hand shown



Internal right-hand shown





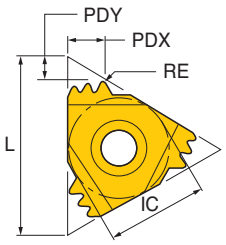
- Application: General industry

Insert	Part Number	TTP Thread Type	Hand	Insert Type	NT Tooth Count	IC Inscribed Circle	TPI Threads per Inch	L Length	RE Radius	PDY Profile Dist. ey	PDX Profile Dist. ex	Grade TT9030
	16ER16UN 2M	EXT	R	Regular	2	0.375	16	0.630	0.007	0.060	0.090	•
	16ER14UN2M	EXT	R	Regular	2	0.375	14	0.630	0.009	0.060	0.090	•
	16ER12UN 2M	EXT	R	Regular	2	0.375	12	0.630	0.010	0.090	0.130	•
	22ER16UN 3M	EXT	R	Regular	3	0.500	16	0.866	0.007	0.100	0.160	•
	22ER12UN 2M	EXT	R	Regular	3	0.500	12	0.866	0.010	0.090	0.130	•
	22ER12UN 3M	EXT	R	Regular	3	0.500	12	0.866	0.010	0.130	0.210	•
	27ER8UN 2M	EXT	R	Regular	2	0.625	8	1.063	0.016	0.120	0.190	•
	16IR16UN 2M	INT	R	Regular	2	0.375	16	0.630	0.004	0.060	0.090	•
	22IR16UN 3M	INT	R	Regular	2	0.500	16	0.866	0.004	0.100	0.160	•
	22IR12UN 2M	INT	R	Regular	2	0.500	12	0.866	0.005	0.090	0.130	•
	22IR12UN 3M	INT	R	Regular	3	0.500	12	0.866	0.005	0.130	0.210	•
	27IR8UN 2M	INT	R	Regular	2	0.625	8	1.063	0.007	0.120	0.190	•

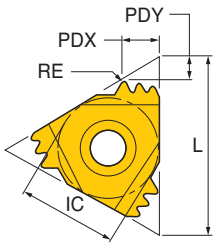
External & Internal NPT

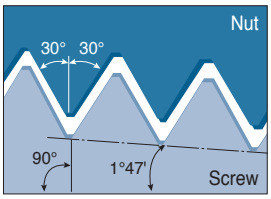
Full profile, multi-tooth, national pipe threads

External right-hand shown



Internal right-hand shown





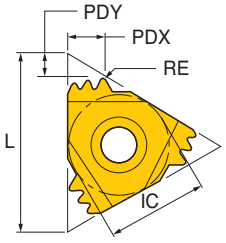
- Application: Steam, gas and water pipes

Insert	Part Number	TTP Thread Type	Hand	Insert Type	NT Tooth Count	IC Inscribed Circle	TPI Threads per Inch	L Length	RE Radius	PDY Profile Dist. ey	PDX Profile Dist. ex	Grade TT9030
	22ER11.5NPT 2M	EXT	R	Regular	2	0.500	11.5	0.866	0.004	0.090	0.140	•
	27ER11.5NPT 3M	EXT	R	Regular	3	0.625	11.5	0.866	0.004	0.130	0.220	•
	27ER8NPT 2M	EXT	R	Regular	2	0.625	8	1.063	0.006	0.120	0.200	•
	22IR11.5NPT 2M	INT	R	Regular	2	0.500	11.5	0.866	0.004	0.090	0.140	•
	27IR11.5NPT 3M	INT	R	Regular	3	0.625	11.5	0.866	0.004	0.130	0.220	•
	27IR8NPT 2M	INT	R	Regular	2	0.625	8	1.063	0.005	0.120	0.200	•

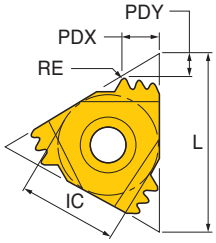
External & Internal Whitworth

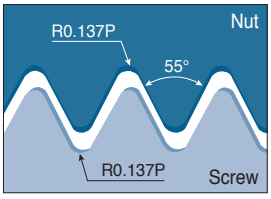
Full profile, multi-tooth, BSW, BSF, BSP

External right-hand shown



Internal right-hand shown





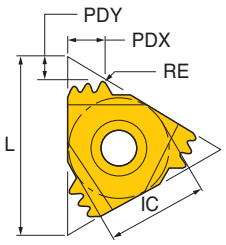
- Application: General industry, fittings and pipe coupings

Insert	Part Number	TTP Thread Type	Hand	Insert Type	NT Tooth Count	IC Inscribed Circle	TPI Threads per Inch	L Length	RE Radius	PDY Profile Dist. ey	PDX Profile Dist. ex	Grade TT9030
	16ER14W 2M	EXT	R	Regular	2	0.375	14	0.630	0.008	0.070	0.110	•
	22ER14W 3M	EXT	R	Regular	3	0.500	14	0.866	0.008	0.110	0.180	•
	22ER11W 2M	EXT	R	Regular	2	0.500	11	0.866	0.011	0.090	0.130	•
	16IR14W 2M	INT	R	Regular	2	0.375	14	0.630	0.009	0.070	0.110	•
	22IR14W 3M	INT	R	Regular	3	0.500	14	0.866	0.008	0.110	0.180	•
	22IR11W 2M	INT	R	Regular	2	0.500	11	0.866	0.011	0.090	0.130	•

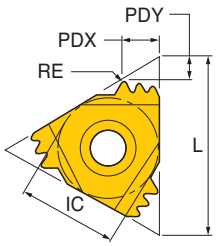
API - Oil Threads

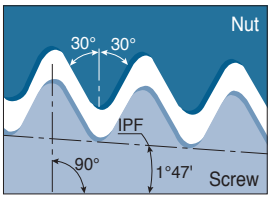
Round profile, multi-tooth

External right-hand shown



Internal right-hand shown





- Application: Oil & gas industry

Insert	Part Number	**TTP** Thread Type	Hand	Insert Type	**NT** Tooth Count	**IC** Inscribed Circle	**TPI** Threads per Inch	**L** Length	**RE** Radius	**PDY** Profile Dist. ey	**PDX** Profile Dist. ex	Grade TT9030
	22ER10APIRD 2M	EXT	R	Regular	2	0.500	10	0.866	0.75	0.090	0.150	•
	27ER10APIRD 3M	EXT	R	Regular	3	0.625	10	1.063	0.75	0.150	0.240	•
	27ER8APIRD 2M	EXT	R	Regular	2	0.625	8	1.063	0.75	0.120	0.180	•
	22IR10APIRD 2M	INT	R	Regular	2	0.500	10	0.866	0.75	0.090	0.150	•
	27IR10APIRD 3M	INT	R	Regular	3	0.625	10	1.063	0.75	0.150	0.240	•
	27IR8APIRD 2M	INT	R	Regular	2	0.625	8	1.063	0.75	0.120	0.180	•

OPERATING GUIDELINES

ISO	Material		Condition	Tensile strength (N/mm^2)	Hardness HB	Material No.	Cutting speed (SFM) Coated TT9030
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	420	125	1	380-620
		>=0.25%C	Annealed	650	190	2	360-590
		<0.55%C	Quenched and tempered	850	250	3	330-570
		>=0.55%C	Annealed	750	220	4	300-540
			Quenched and tempered	1000	300	5	300-540
	Low alloy steel and cast steel (Less than 5% of alloying elements)		Annealed	600	200	6	330-590
			Quenched and tempered	930	275	7	250-460
				1000	300	8	230-440
				1200	350	9	230-440
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	260-390
			Quenched and tempered	1100	325	11	160-330
M	Stainless steel and cast steel		Ferritic / martensitic	680	200	12	230-430
			Martensitic	820	240	13	280-360
			Austenitic	600	180	14	300-460
K	Gray cast iron (GG)		Ferritic		160	15	410-520
			Pearlitic		250	16	300-390
	Cast iron nodular (GGG)		Ferritic		180	17	230-430
			Pearlitic		260	18	200-380
	Malleable cast iron		Ferritic		130	19	200-230
			Pearlitic		230	20	200-480
N	Aluminum - Wrought alloy		Not cureable		60	21	330-1200
			Cured		100	22	260-720
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23	660-1310
			Cured		90	24	660-920
		>12% Si	High temp.		130	25	660-920
	Copper alloys	>1% Pb	Free cutting		110	26	260-840
			Brass		90	27	260-840
			Electrolitic copper		100	28	260-840
	Non-metallic		Duroplastics, fiber plastics			29	260-820
			Hard rubber			30	260-820
S	High temp. alloys	Fe based	Annealed		200	31	150-200
			Cured		280	32	110-160
		Ni or Co based	Annealed		250	33	70-100
			Cured		350	34	50-80
			Cast		320	35	50-80
	Titanium, Ti alloys			Rm 400		36	460-560
			Alpha+beta alloys cured	Rm 1050		37	160-230
H	Hardened steel		Hardened		55HRC	38	150-200
			Hardened		60HRC	39	150-200
	Chilled cast iron		Cast		400	40	150-200
	Cast iron nodular		Hardened		55HRC	41	150-200

• For more information of material groups, see the Technical Guide "material conversion table".

Steel Stainless steel Cast iron Nonferrous High temp. alloys Hardened steel

T-THREAD™

RECOMMENDED NUMBER OF PASSES

Full Profile	Insert Description	No. of Passes	1st Pass	2nd Pass	3rd Pass	4th Pass	EXT / INT
ISO metric	**16 ER 1.0 ISO 3M**	2	.0154"	.0094"	-	-	EXT
	16 ER 1.5 ISO 2M	3	.0157"	.0122"	.0083"	-	EXT
	22 ER 1.5 ISO 3M	2	.0213"	.0150"	-	-	EXT
	22 ER 2.0 ISO 2M	3	.0220"	.0165"	.0106"	-	EXT
	22 ER 2.0 ISO 3M	2	.0295"	.0197"	-	-	EXT
	27 ER 3.0 ISO 2M	4	.0236"	.0205"	.0173"	.0118"	EXT
	16 IR 1.0 ISO 3M	2	.0125"	.0102"	-	-	INT
	16 IR 1.5 ISO 2M	3	.0142"	.0114"	.0087"	-	INT
	22 IR 1.5 ISO 3M	2	.0193"	.0150"	-	-	INT
	22 IR 2.0 ISO 2M	3	.0197"	.0157"	.0098"	-	INT
	22 IR 2.0 ISO 3M	2	.0283"	.0169"	-	-	INT
	27 IR 3.0 ISO 2M	4	.0224"	.0177"	.0150"	.0130"	INT
UN	**16 ER 16 UN 2M**	3	.0177"	.0125"	.0079"	-	EXT
	22 ER 16 UN 3M	2	.0236"	.0146"	-	-	EXT
	22 ER 12 UN 2M	3	.0236"	.0154"	.0122"	-	EXT
	22 ER 12 UN 3M	2	.0315"	.0197"	-	-	EXT
	27 ER 8 UN 2M	4	.0248"	.0216"	.0165"	.0142"	EXT
	16 IR 16 UN 2M	3	.0157"	.0114"	.0091"	-	INT
	22 IR 16 UN 3M	2	.0224"	.0138"	-	-	INT
	22 IR 12 UN 2M	3	.0216"	.0154"	.0110"	-	INT
	22 IR 12 UN 3M	2	.0295"	.0185"	-	-	INT
	27 IR 8 UN 2M	4	.0256"	.0193"	.0165"	.0106"	INT
NPT	**22 ER 11.5 NPT 2M**	4	.0216"	.0181"	.0138"	.0125"	EXT
	27 ER 11.5 NPT 3M	3	.0295"	.0224"	.0142"	-	EXT
	27 ER 8 NPT 2M	4	.0315"	.0244"	.0213"	.0177"	EXT
	22 IR 11.5 NPT 2M	4	.0216"	.0181"	.0138"	.0125"	INT
	27 IR 11.5 NPT 3M	3	.0295"	.0224"	.0142"	-	INT
	27 IR 8 NPT 2M	4	.0315"	.0244"	.0213"	.0177"	INT
Whitworth	**16 ER 14 W 2M**	3	.0200"	.0154"	.0102"	-	EXT
	22 ER 14 W 3M	2	.0283"	.0173"	-	-	EXT
	22 ER 11 W 2M	3	.0256"	.0181"	.0146"	-	EXT
	16 IR 14 W 2M	3	.0200"	.0154"	.0102"	-	INT
	22 IR 14 W 3M	2	.0283"	.0173"	-	-	INT
	22 IR 11 W 2M	3	.0256"	.0181"	.0146"	-	INT
API round	**22 ER 10 API RD 2M**	3	.0228"	.0209"	0118"	-	EXT
	27 ER 10 API RD 3M	2	.0386"	.0169"	-	-	EXT
	27 ER 8 API RD 2M	3	.0323"	.0232"	.0157"	-	EXT
	22 IR 10 API RD 2M	3	.0228"	.0209"	0118"	-	INT
	27 IR 10 API RD 3M	2	.0386"	.0169"	-	-	INT
	27 IR 8 API RD 2M	3	.0323"	.0232"	.0157"	-	INT