TYSON infoTECH™

Issue 02

WIDIA

TOP CUT PLUS DRILLS utilizing four cutting edges per insert

The new Widia Top Cut Plus product line stands for increased performance and cost-efficiency. Newly developed drills featuring inserts with four cutting edges guarantee increased productivity and maximum production safety across the full range of applications. These superior tools are available in Inch diameters from .437" to 1.375" and in Metric diameters from 11 mm to 34 mm. There is a choice of three lengths to suit every need, from the highly rigid Top Cut Plus 2 x D to the Top Cut Plus 3 x D and the Top Cut Plus 4 x D for deep holes.

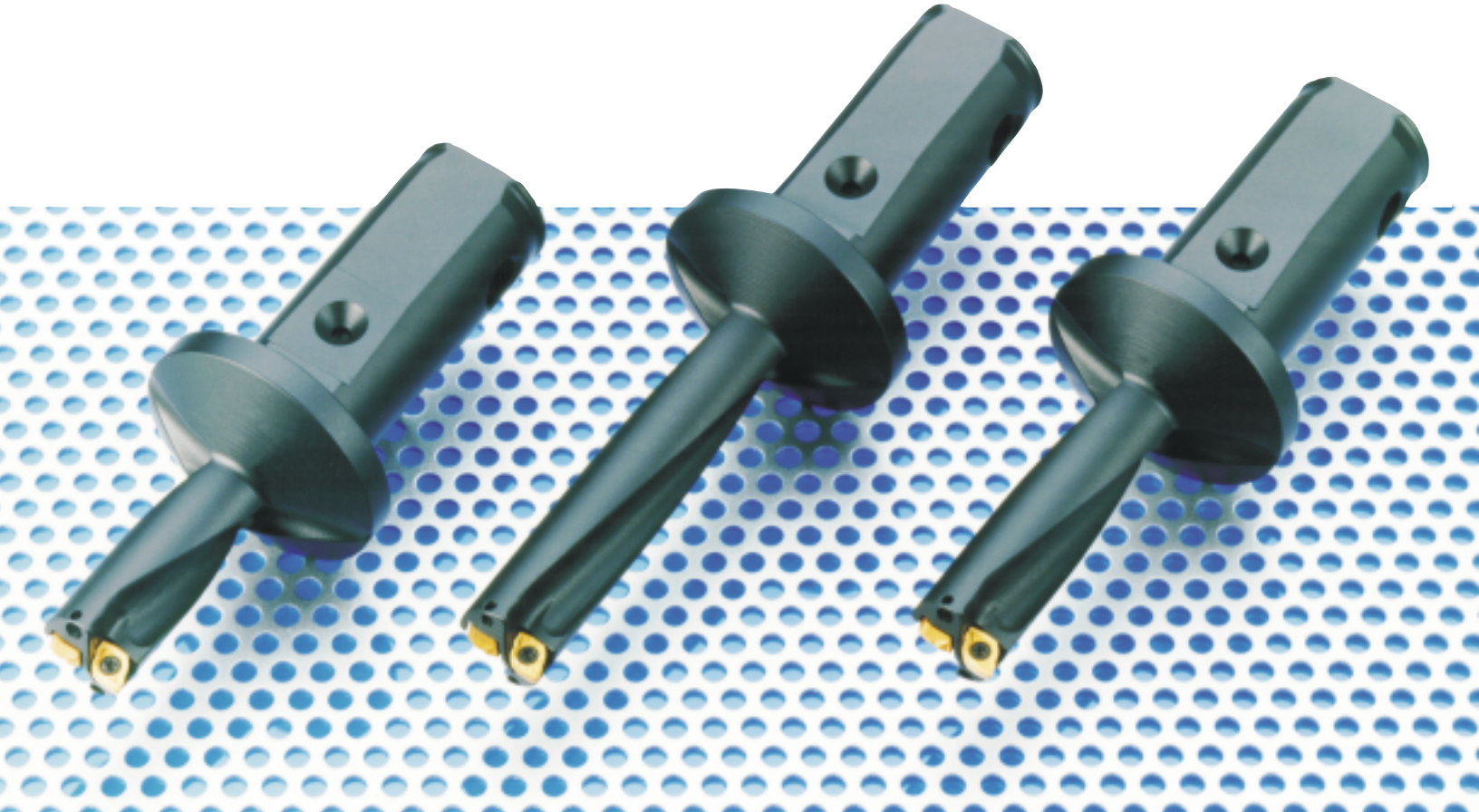
The Tool:

- designed for maximum system stiffness
- with rigid shank for both Inch & Metric Drills
- solid connection with drillholder thanks to conical-tipped clamping screw
- separate coolant passages guarantee stable drilling performance
- even better chip removal thanks to optimized chip spaces

The Insert:

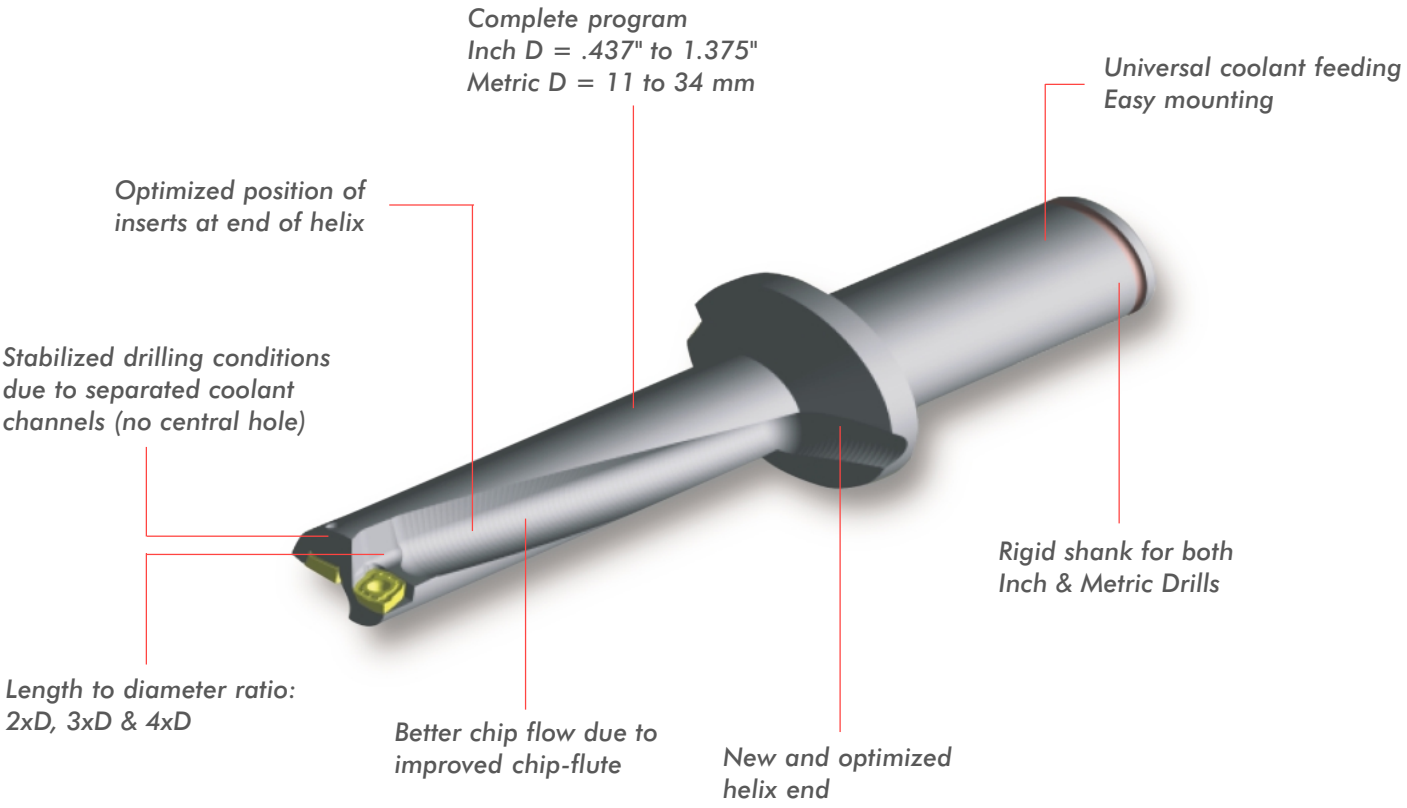
- four effective cutting edges thanks to complete separation of internal and external cutting edges
- basic circular shape guarantees maximum rigidity
- special flank geometry on centre and external cutting edge provides a sturdy cutting wedge and ensures favourable wear performance
- can also be used for simple turning operations

TOP CUT PLUS: cost-effective drilling with four cutting edges.



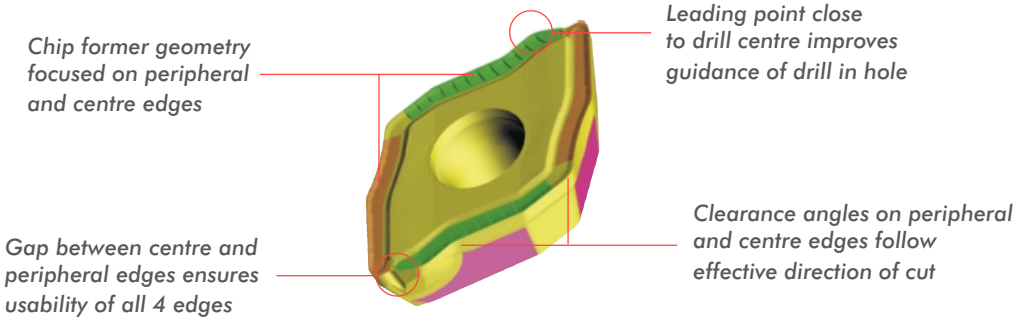
WIDIA Top Cut Plus Drills and Inserts

WIDIA Indexable Insert Drills



Designed for Maximum Tool Rigidity

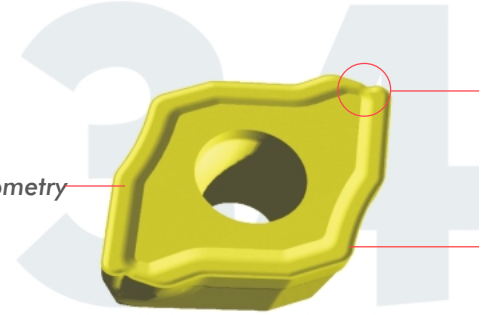
WIDIA XOMT Insert



- Peripheral edge
- Centre edge
- Locating faces

WIDIA Top Cut Plus Indexable Insert Geometries

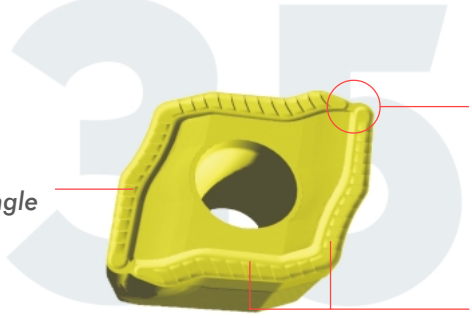
Geometry -34



Application:

- *Steels*
- *Cast iron*
- *Interrupted cuts*
- *For unfavourable conditions*

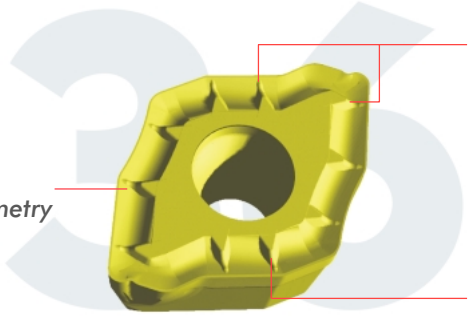
Geometry -35



Application:

- *High alloyed steels and stainless steels*
- *Cast irons*
- *Non-ferrous metals/alloys*
- *High performance drilling (high speed and feed)*
- *For unstable conditions*
- *If low bur or chipping at through hole exit required*

Geometry -36



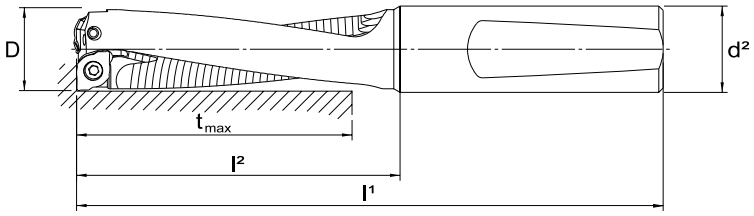
Application:

- *Low alloyed steels*
- *Mild and 300 series (austenitic) stainless steels*
- *All gummy materials*
- *Good chip control over wide feed range*
- *For improved chip control on stringy materials*
- *If low bur or chipping at through hole exit required*

WIDIA Top Cut Plus Indexable Insert Drills

TCPR Metric Drills
Depth to Diameter Ratio: 2 x D

Diameter Range: 11.0 mm - 14.0 mm

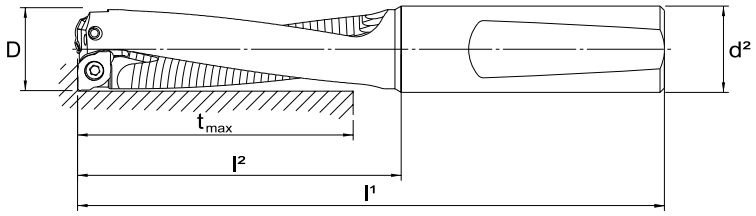


D mm	DESIGNATION	D inch	d² mm	l¹ inch	l² inch	t_{max} inch
	Insert: XOMT-04T103-34 / XOMT-04T103-35					
11.0	**TCPR-11R2**	.433	12	2.99	1.22	.86
11.5	**TCPR-11.5R2**	.452	12	3.07	1.30	.90
12.0	**TCPR-12R2**	.472	12	3.11	1.34	.94
12.5	**TCPR-12.5R2**	.492	16	3.27	1.38	.98
13.0	**TCPR-13R2**	.511	16	3.35	1.46	1.02
13.5	**TCPR-13.5R2**	.531	16	3.39	1.50	1.06
14.0	**TCPR-14R2**	.551	16	3.47	1.60	1.10
	Insert lock screw #214.60.118		*Torx Wrench #214.60.100*			

WIDIA Top Cut Plus Indexable Insert Drills

TCPR Inch Drills
Depth to Diameter Ratio: 3 x D

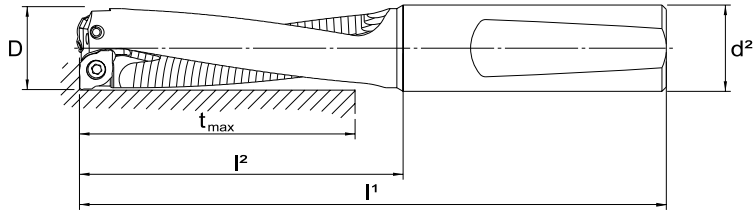
Diameter Range: .437" - .625"



D inch	DESIGNATION	D mm	d² inch	l¹ inch	l² inch	t max inch
	Insert: XOMT-04T103-34 / XOMT-04T103-35					
.437	**TCPR-0437R3**	11.11	.625	3.60	1.69	1.32
.500	**TCPR-0500R3**	12.70	.625	3.84	1.93	1.50
.562	**TCPR-0562R3**	14.28	.625	4.07	2.17	1.69
	Insert lock screw #214.60.118		*Torx Wrench #214.60.100*			
	Insert: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36					
.625	**TCPR-0625R3**	15.87	.625	4.35	2.44	1.88
	Insert lock screw #214.60.125		*Torx Wrench #214.75.490*			

TCPR Metric Drills
Depth to Diameter Ratio: 3 x D

Diameter Range: 11.0 mm - 14.0 mm



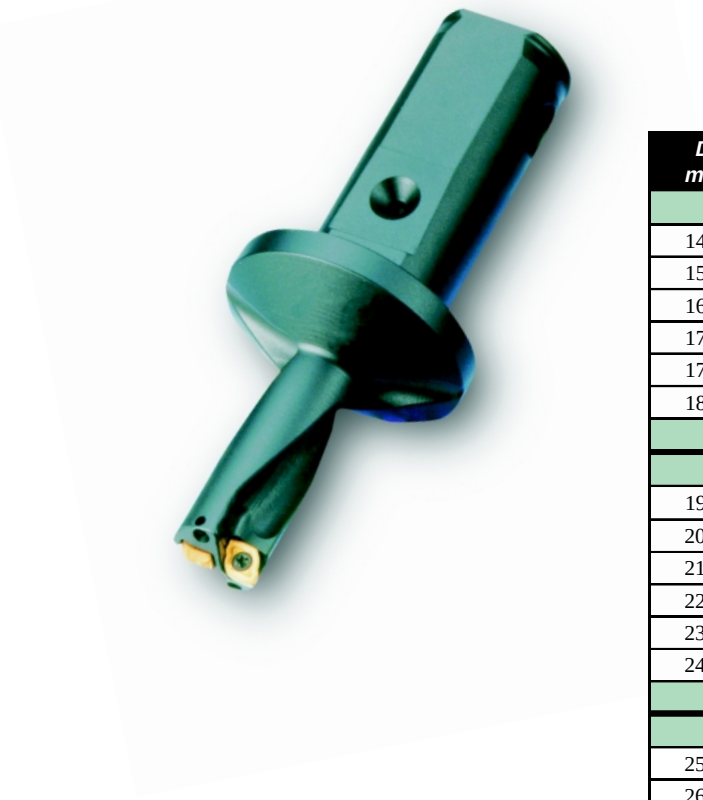
D mm	DESIGNATION	D inch	d² mm	l¹ inch	l² inch	t max inch
	Insert: XOMT-04T103-34 / XOMT-04T103-35					
11.0	**TCPR-11R3**	.433	12	3.46	1.69	1.29
11.5	**TCPR-11.5R3**	.452	12	3.54	1.77	1.37
12.0	**TCPR-12R3**	.472	12	3.62	1.85	1.41
12.5	**TCPR-12.5R3**	.492	16	3.82	1.93	1.49
13.0	**TCPR-13R3**	.511	16	3.90	2.01	1.53
13.5	**TCPR-13.5R3**	.531	16	3.98	2.09	1.61
14.0	**TCPR-14R3**	.551	16	4.06	2.17	1.65
	Insert lock screw #214.60.118		*Torx Wrench #214.60.100*			

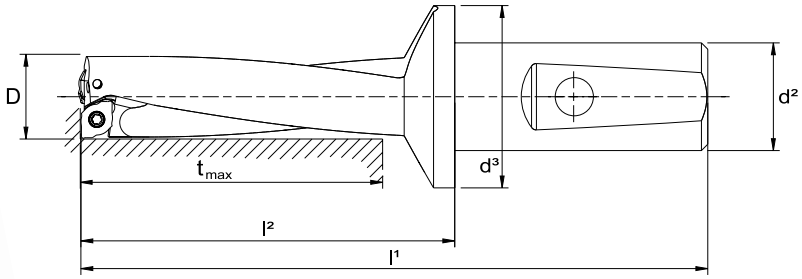
WIDIA Top Cut Plus Indexable Insert Drills

2 D

TCP Metric Drills
Depth to Diameter Ratio: 2 x D

Diameter Range: 14.5 mm - 34.0 mm





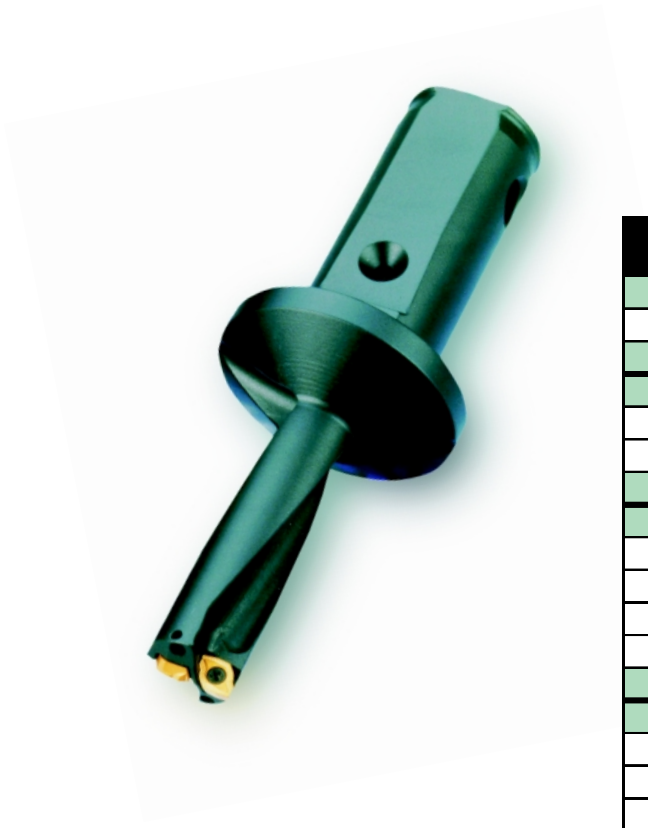
D mm	DESIGNATION	D inch	d^2 mm	d^3 inch	l^1 inch	l^2 inch	t_{max} inch
	Insesrt: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36						
14.5	**TCP-14.5R2**	.570	25	1.69	3.98	1.77	1.14
15.0	**TCP-15R2**	.590	25	1.69	4.02	1.81	1.18
16.0	**TCP-16R2**	.629	25	1.69	4.10	1.89	1.25
17.0	**TCP-17R2**	.669	25	1.69	4.17	1.97	1.33
17.5	**TCP-17.5R2**	.688	25	1.69	4.21	2.01	1.37
18.0	**TCP-18R2**	.708	25	1.69	4.25	2.05	1.41
	Insert lock screw #214.60.125			*Torx Wrench #214.75.490*			
	Insert: XOMT-070304-34 / XOMT-070304-35 / XOMT-070304-36						
19.0	**TCP-19R2**	.748	25	1.69	4.33	2.13	1.49
20.0	**TCP-20R2**	.787	25	1.69	4.41	2.21	1.57
21.0	**TCP-21R2**	.826	25	1.69	4.49	2.28	1.65
22.0	**TCP-22R2**	.866	25	1.69	4.57	2.36	1.73
23.0	**TCP-23R2**	.905	25	1.69	4.65	2.44	1.81
24.0	**TCP-24R2**	.944	25	1.69	4.72	2.52	1.88
	Insert lock screw #214.80.800			*Torx Wrench #214.80.866*			
	Insert: XOMT-09T306-34 / XOMT-09T306-35						
25.0	**TCP-25R2**	.984	32	1.88	4.92	2.56	1.96
26.0	**TCP-26R2**	1.023	32	1.88	5.00	2.64	2.04
27.0	**TCP-27R2**	1.062	32	1.88	5.08	2.72	2.12
28.0	**TCP-28R2**	1.102	32	1.88	5.12	2.76	2.20
29.0	**TCP-29R2**	1.141	32	1.88	5.20	2.84	2.28
30.0	**TCP-30R2**	1.181	32	1.88	5.28	2.91	2.36
31.0	**TCP-31R2**	1.220	32	1.88	5.39	2.99	2.44
32.0	**TCP-32R2**	1.259	32	1.88	5.43	3.07	2.51
33.0	**TCP-33R2**	1.299	32	1.88	5.51	3.15	2.59
34.0	**TCP-34R2**	1.338	32	1.88	5.59	3.23	2.67
	Insert lock screw #214.80.672			*Torx Wrench #214.80.866*			

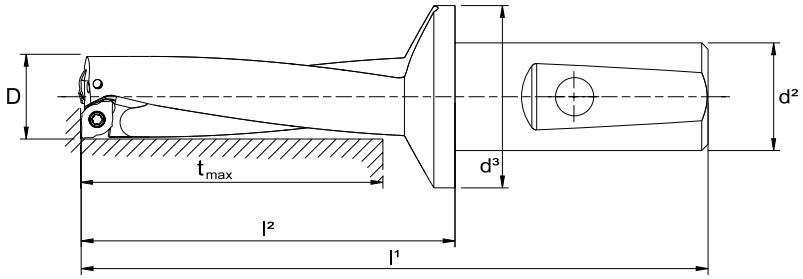
WIDIA Top Cut Plus Indexable Insert Drills

TCP Inch Drills

Depth to Diameter Ratio: 3 x D

Diameter Range: .562" - 1.375"





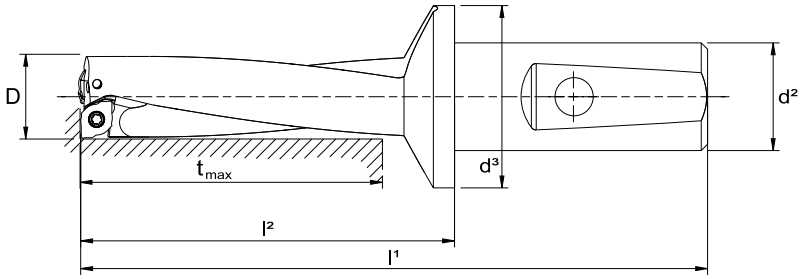
D inch	DESIGNATION	D mm	d^2 inch	d^3 inch	l^1 inch	l^2 inch	t_{max} inch
	Insert: XOMT-04T103-34 / XOMT-04T103-35						
.562	**TCP-0562R3**	14.28	1.000	1.63	4.52	2.17	1.70
	Insert lock screw #214.60.118			*Torx Wrench #214.60.100*			
	Insert: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36						
.625	**TCP-0625R3**	15.87	1.000	1.63	4.79	2.44	1.90
.687	**TCP-0687R3**	17.46	1.000	1.63	5.03	2.68	2.10
	Insert lock screw #214.60.125			*Torx Wrench #214.75.490*			
	Insert: XOMT-070304-34 / XOMT-070304-35 / XOMT-070304-36						
.750	**TCP-0750R3**	19.05	1.000	1.63	5.30	2.95	2.25
.812	**TCP-0812R3**	20.63	1.000	1.63	5.42	3.07	2.45
.875	**TCP-0875R3**	22.22	1.000	1.63	5.66	3.31	2.65
.937	**TCP-0937R3**	23.81	1.000	1.63	5.78	3.43	2.85
	Insert lock screw #214.80.800			*Torx Wrench #214.80.866*			
	Insert: XOMT-09T306-34 / XOMT-09T306-35						
1.000	**TCP-1000R3**	25.40	1.250	1.88	6.07	3.62	3.00
1.062	**TCP-1062R3**	26.98	1.250	1.88	6.19	3.74	3.19
1.125	**TCP-1125R3**	28.57	1.250	1.88	6.43	3.98	3.38
1.187	**TCP-1187R3**	30.16	1.250	1.88	6.66	4.21	3.56
1.250	**TCP-1250R3**	31.75	1.250	1.88	6.78	4.33	3.75
1.312	**TCP-1312R3**	33.33	1.250	1.88	6.98	4.53	3.94
1.375	**TCP-1375R3**	34.92	1.250	1.88	7.10	4.65	4.13
	Insert lock screw #214.80.672			*Torx Wrench #214.80.866*			

WIDIA Top Cut Plus Indexable Insert Drills

TCP Inch Drills

Depth to Diameter Ratio: 4 x D

Diameter Range: .625" - 1.375"



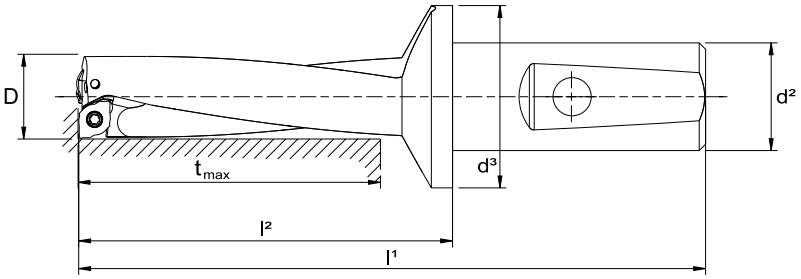
D inch	DESIGNATION	D mm	d² inch	d³ inch	l¹ inch	l² inch	t max inch
	Insert: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36						
.625	**TCP-0625R4**	15.87	1.000	1.63	5.46	3.11	2.50
	Insert lock screw #214.60.125				*Torx Wrench #214.75.490*		
	Insert: XOMT-070304-34 / XOMT-070304-35 / XOMT-070304-36						
.750	**TCP-0750R4**	19.05	1.000	1.63	6.09	3.74	3.00
.875	**TCP-0875R4**	22.22	1.000	1.63	6.56	4.21	3.50
	Insert lock screw #214.80.800				*Torx Wrench #214.80.866*		
	Insert: XOMT-09T306-34 / XOMT-09T306-35						
1.000	**TCP-1000R4**	25.40	1.250	1.88	7.14	4.69	4.00
1.125	**TCP-1125R4**	28.57	1.250	1.88	7.61	5.16	4.50
1.250	**TCP-1250R4**	31.75	1.250	1.88	8.08	5.63	5.00
1.375	**TCP-1375R4**	34.92	1.250	1.88	8.55	6.10	5.50
	Insert lock screw #214.80.672				*Torx Wrench #214.80.866*		

WIDIA Top Cut Plus Indexable Insert Drills

TCP Inch Drills

Depth to Diameter Ratio: 4 x D

Diameter Range: .625" - 1.375"



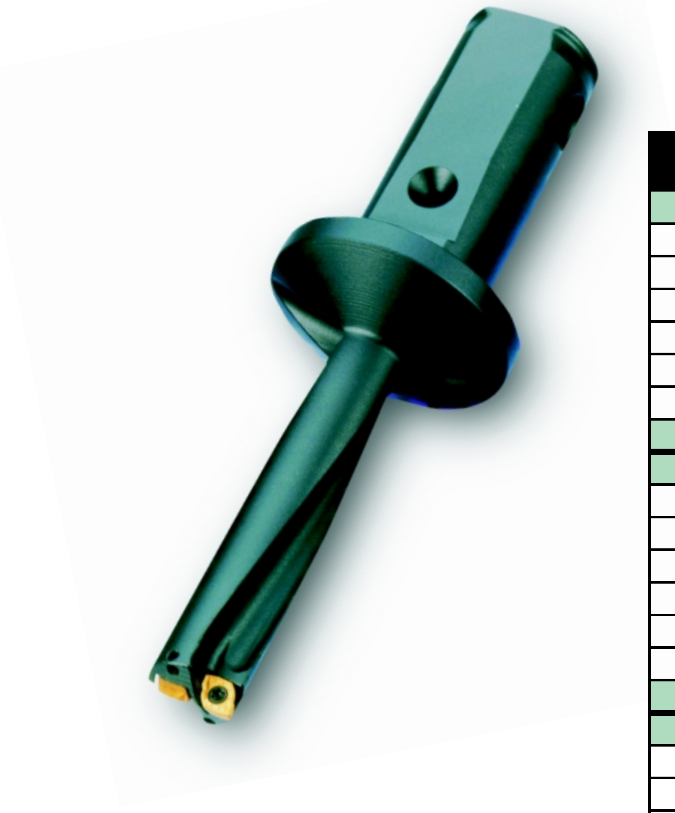
D inch	DESIGNATION	D mm	d² inch	d³ inch	l¹ inch	l² inch	t max inch
	Insert: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36						
.625	**TCP-0625R4**	15.87	1.000	1.63	5.46	3.11	2.50
	Insert lock screw #214.60.125				*Torx Wrench #214.75.490*		
	Insert: XOMT-070304-34 / XOMT-07304-35 / XOMT-07304-36						
.750	**TCP-0750R4**	19.05	1.000	1.63	6.09	3.74	3.00
.875	**TCP-0875R4**	22.22	1.000	1.63	6.56	4.21	3.50
	Insert lock screw #214.80.800				*Torx Wrench #214.80.866*		
	Insert: XOMT-09T306-34 / XOMT-09T306-35						
1.000	**TCP-1000R4**	25.40	1.250	1.88	7.14	4.69	4.00
1.125	**TCP-1125R4**	28.57	1.250	1.88	7.61	5.16	4.50
1.250	**TCP-1250R4**	31.75	1.250	1.88	8.08	5.63	5.00
1.375	**TCP-1375R4**	34.92	1.250	1.88	8.55	6.10	5.50
	Insert lock screw #214.80.672				*Torx Wrench #214.80.866*		

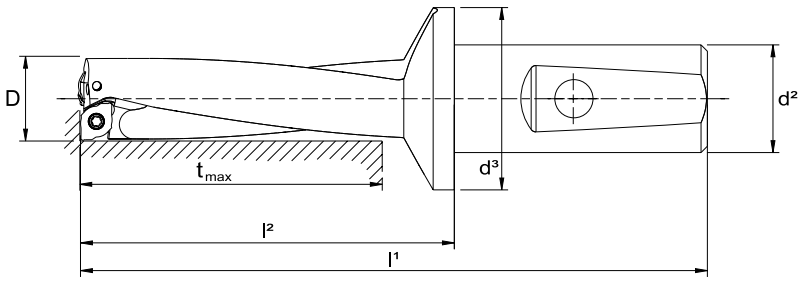
WIDIA Top Cut Plus Indexable Insert Drills

4 D

TCP Metric Drills
Depth to Diameter Ratio: 4 x D

Diameter Range: 14.5 mm - 34.0 mm





D mm	DESIGNATION	D inch	d^2 mm	d^3 inch	l^1 inch	l^2 inch	t_{max} inch
	Insert: XOMT-050204-34 / XOMT-050204-35 / XOMT-050204-36						
14.5	**TCP-14.5R4**	.570	25	1.69	5.24	3.03	2.28
15.0	**TCP-15R4**	.590	25	1.69	5.31	3.11	2.36
16.0	**TCP-16R4**	.629	25	1.69	5.47	3.27	2.51
17.0	**TCP-17R4**	.669	25	1.69	5.63	3.43	2.67
17.5	**TCP-17.5R4**	.688	25	1.69	5.71	3.50	2.75
18.0	**TCP-18R4**	.708	25	1.69	5.79	3.58	2.83
	Insert lock screw #214.60.125			*Torx Wrench #214.75.490*			
	Insert: XOMT-070304-34 / XOMT-070304-35 / XOMT-070304-36						
19.0	**TCP-19R4**	.748	25	1.69	5.95	3.74	2.99
20.0	**TCP-20R4**	.787	25	1.69	6.10	3.90	3.14
21.0	**TCP-21R4**	.826	25	1.69	6.26	4.06	3.30
22.0	**TCP-22R4**	.866	25	1.69	6.42	4.21	3.46
23.0	**TCP-23R4**	.905	25	1.69	6.58	4.37	3.62
24.0	**TCP-24R4**	.944	25	1.69	6.73	4.53	3.77
	Insert lock screw #214.80.800			*Torx Wrench #214.80.866*			
	Insert: XOMT-09T306-34 / XOMT-09T306-35						
25.0	**TCP-25R4**	.984	32	1.88	7.05	4.69	3.93
26.0	**TCP-26R4**	1.023	32	1.88	7.21	4.84	4.09
27.0	**TCP-27R4**	1.062	32	1.88	7.36	5.00	4.25
28.0	**TCP-28R4**	1.102	32	1.88	7.52	5.16	4.40
29.0	**TCP-29R4**	1.141	32	1.88	7.68	5.32	4.56
30.0	**TCP-30R4**	1.181	32	1.88	7.84	5.47	4.72
31.0	**TCP-31R4**	1.220	32	1.88	7.99	5.63	4.88
32.0	**TCP-32R4**	1.259	32	1.88	8.15	5.79	5.03
33.0	**TCP-33R4**	1.299	32	1.88	8.31	5.95	5.19
34.0	**TCP-34R4**	1.338	32	1.88	8.47	6.10	5.35
	Insert lock screw #214.80.672			*Torx Wrench #214.80.866*			

WIDIA Top Cut Plus Carbide Indexable Inserts

The Geometries

For the reliable machining of common and difficult-to-machine work materials, WIDIA offers a range of three new geometries. Each has strengthened cutting edges to guarantee maximum production safety. Precision-sintered inserts ensure smooth finishes, exact positioning and dimensionally accurate drilling.

XOMT...-34

The all purpose geometry for drilling common work materials, particularly under unfavourable conditions, e.g. interrupted cuts. Strong cutting edge and reinforced centre cutting edge.

- for steels and cast irons

XOMT...-35

Fish-scale geometry with low cutting forces and highly positive rake angle. High-performance geometry for high cutting speeds and heavy feeds, also in non-rigid set-ups. Reduced burring and edge chipping, so ideal for through and cross holes.

- for high-alloy and
- stainless steels, cast irons and nonferrous metals

XOMT...-36

Claw geometry with optimized external and centre cutting edge. Produces short chips with reliable chip control, grooved chips with no loss of stability and a positive chip control geometry.

- low alloyed steels
- mild and 300 series (austenitic) stainless steels
- all gummy materials

The Grades

Four carbide grades guarantee optimum machining performance in almost every drilling operation.

TN7015 (HC-P15)

New WIDASELECT grade consisting of a thermal and mechanical shock resistant hardmetal substrate with modified edge zone and Moderate Temperature CVD coating of TiN-TiCN-Al_2O_3-ZrCN. Top layer of ZrCN has residual compressive stresses to protect against cracking. TN7015 ideally combines high wear resistance for long tool life and excellent toughness with high production safety. First choice for drilling steels at high cutting speeds on rigid set-ups.

TPC35 (HP-P35, M30)

The first choice for all steel applications. Extremely fracture resistant and mechanical shock resistant hardmetal substrate with a highly crack resistant TiN coating produced by Plasma CVD method. Covers a wide range of applications in drilling. For general and stainless steels, nodular cast irons. Particularly suitable for unfavourable conditions.

TN5515 (HC-K15)

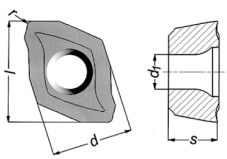
New grade combining a hardmetal substrate of high compresive strength and high thermal and mechanical shock resistance with a Moderate Temperature CVD coating of TiN-TiCN-Al_2O_3. With its high wear resistance and edge strength this grade is ideal for drilling cast irons.

THM (HW-K15)

Uncoated hardmetal grade offering high edge strength, sharp edges and great toughness. This classic two-phase carbide has an ideal microstructure and offers outstanding resistance to fracture and elevated temperatures. Recommended for cast irons, nonferrous metals and high-temperature alloys.

XOMT- ...

TOP CUT INSERTS, THE PERFECT CHOICE.

WIDIA Insert	Designation	Dimensions					Coated									Uncoated			
		l	s	r	d	d_1													
	XOMT-04T103-34	.188	5/64	.012	.178	.083			●				●	●					●
	XOMT-04T103-35			.012					●				●	●					●
	XOMT-050204-34	.247	7/64	1/64	7/32	.098			●				●	●					●
	XOMT-050204-35			1/64					●				●	●					●
	XOMT-050204-36			1/64					●				●						
	XOMT-070304-34	.328	1/8	1/64	.273	.110			●				●	●					●
	XOMT-070304-35			1/64					●				●	●					●
	XOMT-070304-36			1/64					●				●						
	XOMT-09T306-34	.429	5/32	.024	25/64	.134			●				●	●					●
	XOMT-09T306-35			.024					●				●	●					●

WIDIA Top Cut Plus
Recommended Cutting Data

WIDIA Recommended Data for TCP Drills

DIN ISO 513	Work Material		Condition	Hardness HB	Material Group	Cutting Speeds in SFPM TN7015			TPC35				Feed f (inches/rev) for Drill diameter D D = .433" - .551" (11mm -14mm)			D = .571" - .709" (14.5mm - 18mm)			D = .748" - .945" (19mm - 24mm)			D = .984" - 1.339" (25mm - 34mm)		
P	Unalloyed steel, cast steel and free cutting steel	< 0.25% C	annealed	125	1	975	780	585	845	666	487		.0015	.002	.003	.0015	.003	.004	.002	.0035	.005	.003	.005	.0055
		≥ 0.25% C	annealed	190	2	910	747	585	780	601	422		.002	.003	.004	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
		< 0.55% C	hardened	250	3	910	715	520	715	552	390		.002	.003	.004	.002	.004	.0055	.003	.005	.007	.004	.006	.008
		≤ 0.55% C	annealed	220	4	910	715	520	715	552	390		.002	.003	.004	.002	.004	.0055	.003	.005	.007	.004	.006	.008
			hardened	300	5	845	650	455	650	487	325		.0015	.002	.003	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
	Low alloy steel and cast steel		annealed	200	6	910	747	585	780	601	422		.002	.003	.004	.002	.004	.0055	.003	.005	.007	.004	.006	.008
				275	7	910	715	520	715	552	390		.002	.003	.004	.002	.004	.0055	.003	.005	.007	.004	.006	.008
			hardened	300	8	845	650	455	650	487	325		.0015	.002	.003	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
				350	9	780	585	390	585	422	260		.0015	.002	.003	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
	High alloy steel, cast steel & tool steel		annealed	200	10	910	715	520	715	552	390		.002	.003	.004	.002	.004	.0055	.003	.005	.007	.004	.006	.008
			hardened	352	11	780	585	390	585	422	260		.002	.003	.004	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
M	400 Series Stainless steel and cast steel		ferritic / martensitic	200	12	845	650	455	650	487	325		.0015	.002	.003	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
			martensitic	240	13	780	617	455	585	422	260		.0015	.002	.003	.002	.003	.005	.002	.004	.0055	.003	.005	.0055
	300 Series Stainless steel		austenitic	180	14	747	585	422	487	357	228		.0015	.002	.003	.002	.005	.004	.002	.003	.005	.003	.004	.005

DIN ISO 513	Work Material		Condition	Hardness HB	Material Group	Cutting Speeds in SFPM TN5515			TPC35			THM			Feed f (inches/rev) for Drill diameter D D = .433" - .551 (11mm -14mm)			D = .571" - .709" (14.5mm - 18mm)			D = .748" - .945" (19mm - 24mm)			D = .984" - 1.339" (25mm - 34mm)		
K	Grey cast iron		ferritic/pearlitic	180	15	845	650	455				520	390	260	.003	.0035	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.0085
			pearlitic	260	16	747	568	390				422	308	195	.0025	.003	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.0085
	Nodular cast iron		ferritic	160	17	812	617	422	650	487	325	520	390	260	.0025	.003	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.0085
			pearlitic	250	18	747	568	390	585	422	260	422	308	195	.0025	.003	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.008
	Malleable cast iron		ferritic	130	19	812	617	422	715	552	390	585	438	293	.0025	.003	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.008
			pearlitic	230	20	682	520	357	650	487	325	520	390	260	.0025	.003	.004	.003	.004	.0055	.004	.006	.008	.004	.006	.008
N	Aluminum alloys wrought		non-age-hardenable	60	21							1625	1218	813	.0025	.003	.005	.0025	.004	.0055	.003	.005	.007	.004	.006	.0085
			age-hardened	100	22							1625	1218	813	.0025	.003	.005	.0025	.004	.0055	.003	.005	.007	.004	.006	.0085
	Cast aluminium alloys	≤ 12% Si	non-age-hardenable	75	23							1462	1056	650	.0025	.003	.005	.0025	.004	.0055	.003	.005	.007	.004	.006	.0085
			age hardened	90	24							1462	1056	650	.0025	.003	.005	.0025	.004	.0055	.003	.005	.007	.004	.006	.0085
		> 12% Si	heat resisting	130	25							1040	764	488	.0025	.003	.005	.0025	.004	.0055	.003	.005	.007	.004	.006	.0085
	Copper & copper alloys	> 1% Pb	lead alloy	110	26							487	374	260	.0025	.003	.005	.003	.004	.0055	.004	.006	.008	.005	.006	.0095
			Brass, red brass	90	27							487	374	260	.0025	.003	.005	.003	.004	.0055	.004	.006	.008	.005	.006	.0095
			Bronze, electrolyte-Cu	100	28							455	325	195	.0025	.003	.005	.003	.004	.0055	.004	.006	.008	.005	.006	.0095

WARNING: Cutting tools are susceptible to chipping and/or fragmenting while in use. Machine guards and personal protective clothing/equipment should be utilized at all times to prevent bodily injury from flying particles or chips. Adequate ventilation and body protection should be provided when grinding tools. Hazardous dust and mist are produced during grinding; avoid breathing of and prolonged skin contact. Workers should be provided with adequate ventilation and body protection.

TYSON TOOL™

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