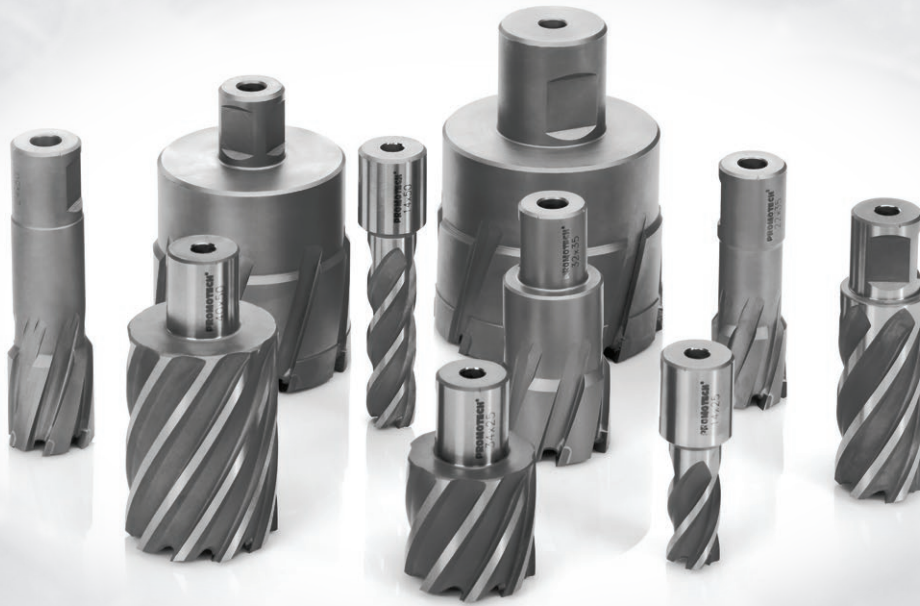


METRIC ANNULAR CUTTERS | HSS & TCT

HSS cutters are made of high speed steel with multi-cut geometry for ply-cutting to gain better removal of chips. TCT cutters incorporate selected special-purpose carbide tips with multi-cut geometry for ply-cutting, lower friction and reduced damage of tips. Both types of the cutters include Weldon shank with more firm clamping for stable cutting and finish of the holes.



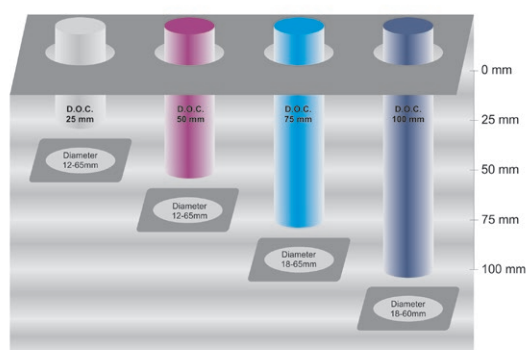
Annular cutters advantages over twist drills:

- save time and money by eliminating costly pilot holes and step drilling
- cut material only at the periphery of the hole, whereas twist drills convert entire hole to chips
- drill holes 3 times faster than twist drills
- drill on curved surfaces such as pipe or tubing
- overlap cuts on existing holes
- produce reamed quality burr-free holes
- reduce machine size and power requirements
- resharpenable cutting edges (HSS)

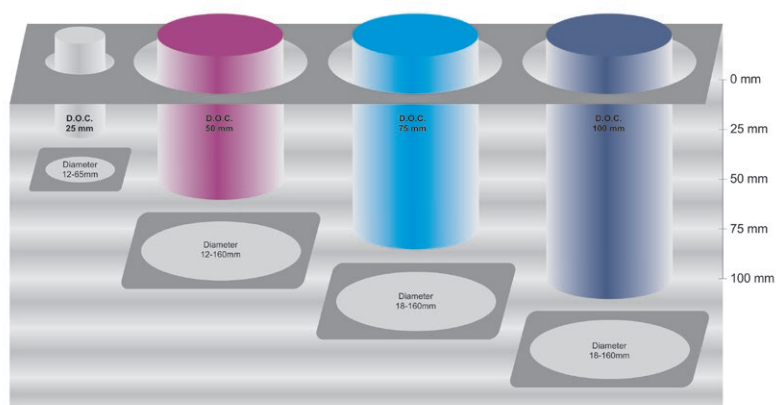
Most important practical guidelines:

- do not use annular cutters without pilot pins and arbors without ejection spring
- it is not safe or productive to use blunt or damaged tools
- mark the center of the hole to be drilled then center pilot pin to locate the hole center
- check if the coolant valve is opened and then depress cutter to show flow of the coolant that increases the cutter life enormously
- maintain a firm and steady feed rate (not too slow) to extend the life of the cutter even more
- pay attention that at the end of the cut the slug will be ejected with force and distance, that may hit someone around
- after drilling the first hole, make sure that the hole diameter conforms to the marking on the annular cutter.
- use recommended work parameters (spindle speed and feed rate) depending on the cutter diameter and workpiece hardness.

HSS cutters



TCT cutters



RECOMMENDED SPINDLE SPEED FOR HSS ANNULAR CUTTERS

Material	Steel ≤ 500 N/mm ²	Steel ≤ 750 N/mm ²	Steel ≤ 900 N/mm ²	Steel ≤ 1200 N/mm ²	Steel ≤ 1400 N/mm ²	Stainless steel	Aluminium	Cast iron	Cast copper
Feed [mm/rev]	0,08-0,13	0,08-0,13	0,05-0,1	0,05-0,1	0,05-0,1	0,05-0,1	0,1-0,15	0,07-0,12	0,08-0,13
Milling speed [m/min]	25	20	13	10	7	12	50	18	40
Cooling	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	Compressed air	5% cooling emulsion
Diameter Ø mm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm
12	663	530	344	265	185	318	1327	477	1061
14	568	454	295	227	159	272	1137	409	909
16	497	397	258	198	139	238	995	358	795
18	442	353	229	176	123	212	885	318	707
20	397	318	206	159	111	190	796	286	636
24	331	265	172	132	92	159	663	238	530
30	265	212	137	106	74	127	531	190	424
36	221	176	114	88	61	106	442	159	353
40	198	159	103	79	55	95	398	143	318
50	159	127	82	63	44	76	318	114	254
65	122	97	63	48	34	58	245	88	195

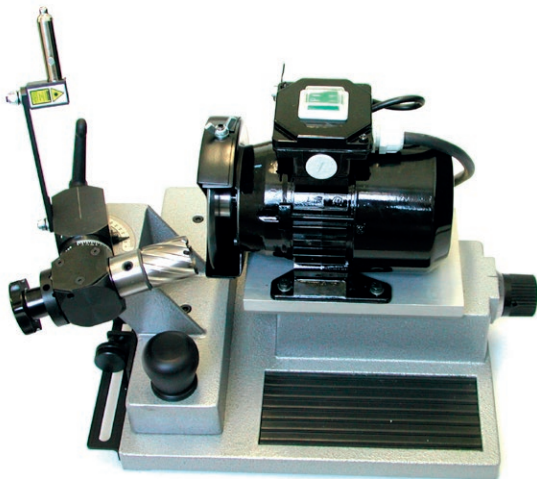
RECOMMENDED SPINDLE SPEED FOR TCT ANNULAR CUTTERS

Material	Steel ≤ 500 N/mm ²	Steel ≤ 750 N/mm ²	Steel ≤ 900 N/mm ²	Steel ≤ 1200 N/mm ²	Steel ≤ 1400 N/mm ²	Stainless steel	Aluminium	Cast iron	Cast copper
Feed [mm/rev]	0,08-0,13	0,08-0,13	0,05-0,1	0,05-0,1	0,05-0,1	0,05-0,1	0,1-0,15	0,07-0,12	0,08-0,13
Milling speed [m/min]	40	37	35	30	25	20	90	60	35
Cooling	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	5% cooling emulsion	Compressed air	5% cooling emulsion
Diameter Ø mm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm
14	909	841	795	682	568	454	2046	1364	795
18	707	654	618	530	442	353	1591	1061	618
20	636	588	557	477	397	318	1432	954	557
22	578	535	506	434	361	289	1302	868	506
24	530	490	464	397	331	265	1193	795	464
30	424	392	371	318	265	212	954	636	371
36	353	327	309	265	221	176	795	530	309
40	318	294	278	238	198	159	716	477	278
50	254	235	222	190	159	127	572	381	222
60	212	196	185	159	132	106	477	318	185
80	159	147	139	119	99	79	358	238	139
100	127	117	111	95	79	63	286	190	111
120	106	98	92	79	66	53	238	159	92
150	84	78	74	63	53	42	190	127	74

Annular cutter regrinding machine SM-101 saves time and money in carrying out an effective HSS core drills re-sharpening, particularly if the customer is in urgent need for continued production drilling. Thanks to its solid construction, low power consumption, small dimensions, the machine can be used in any place and needs short time to be installed

Features and benefits:

- simple set up operation - easy positioning of cutting tool
- economical - far less expensive than heavier equipment
- lightweight and portable - ideal for site work, or a small workshop
- diamond wheel - creates a sharp, clean new cutting edge
- easy angle adjustment - simple alignment to original angle geometry
- laser guided cutter alignment - ensure correct positioning of cutting edge to the wheel
- will re-sharpen cutters from 12mm to 50 mm diameter in cutting depths of 25 mm and 50 mm



SM-101 TECHNICAL SPECIFICATION		
Dimensions L x W x H		465 x 399 x 355 mm
Net weight		15.5 kg
Supply [V]		1-230 V, 50-60 Hz
Motor power / speed		0.18 kW / 2820 rpm
Movement length	Motor guide	70 mm
	Guiding slide	162 mm
Noise level		<70 dB(A)
Grinding disc		Electroplated, diamond grinding disc Ø 125 mm
Cutter's clamping		19.05 mm (Weldon shank)
Max cutter's length		50 mm
Scope of the cutter's diameter		Ø 12 mm - Ø 50 mm

Annular cutter type HSS



Annular cutter type TCT



A range of twist drills with 19.05 mm (3/4) Weldon shank extend the scope of possible drilling applications



Product Code	Description
WRL-000011	Twist drill f 6 mm (Weldon Shank 19.05 mm)
WRL-000012	Twist drill f 8 mm (Weldon Shank 19.05 mm)
WRL-000013	Twist drill f 9.8 mm (Weldon Shank 19.05 mm)
WRL-000009	Twist drill f 10 mm (Weldon Shank 19.05 mm)
WRL-000014	Twist drill f 11 mm (Weldon Shank 19.05 mm)
WRL-000010	Twist drill f 12 mm (Weldon Shank 19.05 mm)
WRL-000015	Twist drill f 13 mm (Weldon Shank 19.05 mm)
WRL-000016	Twist drill f 13.5 mm (Weldon Shank 19.05 mm)
WRL-000017	Twist drill f 14 mm (Weldon Shank 19.05 mm)
WRL-000018	Twist drill f 16 mm (Weldon Shank 19.05 mm)

HSS Metric Annular Cutters				
Dia- meter Metric	25 mm D.O.C. Product Code	50 mm D.O.C. Product Code	75 mm D.O.C. Product Code	100 mm D.O.C. Product Code
12 mm	FRZ-001000	FRZ-001054	N/A	N/A
13 mm	FRZ-001001	FRZ-001055	N/A	N/A
14 mm	FRZ-001002	FRZ-001056	N/A	N/A
15 mm	FRZ-001003	FRZ-001057	N/A	N/A
16 mm	FRZ-001004	FRZ-001058	N/A	N/A
17 mm	FRZ-001005	FRZ-001059	N/A	N/A
18 mm	FRZ-001006	FRZ-001060	FRZ-001108	FRZ-001156
19 mm	FRZ-001007	FRZ-001061	FRZ-001109	FRZ-001157
20 mm	FRZ-001008	FRZ-001062	FRZ-001110	FRZ-001158
21 mm	FRZ-001009	FRZ-001063	FRZ-001111	FRZ-001159
22 mm	FRZ-001010	FRZ-001064	FRZ-001112	FRZ-001160
23 mm	FRZ-001011	FRZ-001065	FRZ-001113	FRZ-001161
24 mm	FRZ-001012	FRZ-001066	FRZ-001114	FRZ-001162
25 mm	FRZ-001013	FRZ-001067	FRZ-001115	FRZ-001163
26 mm	FRZ-001014	FRZ-001068	FRZ-001116	FRZ-001164
27 mm	FRZ-001015	FRZ-001069	FRZ-001117	FRZ-001165
28 mm	FRZ-001016	FRZ-001070	FRZ-001118	FRZ-001166
29 mm	FRZ-001017	FRZ-001071	FRZ-001119	FRZ-001167
30 mm	FRZ-001018	FRZ-001072	FRZ-001120	FRZ-001168
31 mm	FRZ-001019	FRZ-001073	FRZ-001121	FRZ-001169
32 mm	FRZ-001020	FRZ-001074	FRZ-001122	FRZ-001170
33 mm	FRZ-001021	FRZ-001075	FRZ-001123	FRZ-001171
34 mm	FRZ-001022	FRZ-001076	FRZ-001124	FRZ-001172
35 mm	FRZ-001023	FRZ-001077	FRZ-001125	FRZ-001173
36 mm	FRZ-001024	FRZ-001078	FRZ-001126	FRZ-001174
37 mm	FRZ-001025	FRZ-001079	FRZ-001127	FRZ-001175
38 mm	FRZ-001026	FRZ-001080	FRZ-001128	FRZ-001176
39 mm	FRZ-001027	FRZ-001081	FRZ-001129	FRZ-001177
40 mm	FRZ-001028	FRZ-001082	FRZ-001130	FRZ-001178
41 mm	FRZ-001029	FRZ-001083	FRZ-001131	FRZ-001179
42 mm	FRZ-001030	FRZ-001084	FRZ-001132	FRZ-001180
43 mm	FRZ-001031	FRZ-001085	FRZ-001133	FRZ-001181
44 mm	FRZ-001032	FRZ-001086	FRZ-001134	FRZ-001182
45 mm	FRZ-001033	FRZ-001087	FRZ-001135	FRZ-001183
46 mm	FRZ-001034	FRZ-001088	FRZ-001136	FRZ-001184
47 mm	FRZ-001035	FRZ-001089	FRZ-001137	FRZ-001185
48 mm	FRZ-001036	FRZ-001090	FRZ-001138	FRZ-001186
49 mm	FRZ-001037	FRZ-001091	FRZ-001139	FRZ-001187
50 mm	FRZ-001038	FRZ-001092	FRZ-001140	FRZ-001188
51 mm	FRZ-001039	FRZ-001093	FRZ-001141	FRZ-001189
52 mm	FRZ-001040	FRZ-001094	FRZ-001142	FRZ-001190
53 mm	FRZ-001041	FRZ-001095	FRZ-001143	FRZ-001191
54 mm	FRZ-001042	FRZ-001096	FRZ-001144	FRZ-001192
55 mm	FRZ-001043	FRZ-001097	FRZ-001145	FRZ-001193
56 mm	FRZ-001044	FRZ-001098	FRZ-001146	FRZ-001194
57 mm	FRZ-001045	FRZ-001099	FRZ-001147	FRZ-001195
58 mm	FRZ-001046	FRZ-001100	FRZ-001148	FRZ-001196
59 mm	FRZ-001047	FRZ-001101	FRZ-001149	FRZ-001197
60 mm	FRZ-001048	FRZ-001102	FRZ-001150	FRZ-001198
61 mm	FRZ-001049	FRZ-001103	FRZ-001151	
62 mm	FRZ-001050	FRZ-001104	FRZ-001152	
63 mm	FRZ-001051	FRZ-001105	FRZ-001153	
64 mm	FRZ-001052	FRZ-001106	FRZ-001154	
65 mm	FRZ-001053	FRZ-001107	FRZ-001155	

TCT Metric Annular Cutters				
Dia- meter Metric	35 mm D.O.C. Product Code	50 mm D.O.C. Product Code	75 mm D.O.C. Product Code	100 mm D.O.C. Product Code
12 mm	FRZ-001199	FRZ-001253	N/A	N/A
13 mm	FRZ-001200	FRZ-001254	N/A	N/A
14 mm	FRZ-001201	FRZ-001255	N/A	N/A
15 mm	FRZ-001202	FRZ-001256	N/A	N/A
16 mm	FRZ-001203	FRZ-001257	N/A	N/A
17 mm	FRZ-001204	FRZ-001258	N/A	N/A
18 mm	FRZ-001205	FRZ-001259	FRZ-001362	FRZ-001465
19 mm	FRZ-001206	FRZ-001260	FRZ-001363	FRZ-001466
20 mm	FRZ-001207	FRZ-001261	FRZ-001364	FRZ-001467
21 mm	FRZ-001208	FRZ-001262	FRZ-001365	FRZ-001468
22 mm	FRZ-001209	FRZ-001263	FRZ-001366	FRZ-001469
23 mm	FRZ-001210	FRZ-001264	FRZ-001367	FRZ-001470
24 mm	FRZ-001211	FRZ-001265	FRZ-001368	FRZ-001471
25 mm	FRZ-001212	FRZ-001266	FRZ-001369	FRZ-001472
26 mm	FRZ-001213	FRZ-001267	FRZ-001370	FRZ-001473
27 mm	FRZ-001214	FRZ-001268	FRZ-001371	FRZ-001474
28 mm	FRZ-001215	FRZ-001269	FRZ-001372	FRZ-001475
29 mm	FRZ-001216	FRZ-001270	FRZ-001373	FRZ-001476
30 mm	FRZ-001217	FRZ-001271	FRZ-001374	FRZ-001477
31 mm	FRZ-001218	FRZ-001272	FRZ-001375	FRZ-001478
32 mm	FRZ-001219	FRZ-001273	FRZ-001376	FRZ-001479
33 mm	FRZ-001220	FRZ-001274	FRZ-001377	FRZ-001480
34 mm	FRZ-001221	FRZ-001275	FRZ-001378	FRZ-001481
35 mm	FRZ-001222	FRZ-001276	FRZ-001379	FRZ-001482
36 mm	FRZ-001223	FRZ-001277	FRZ-001380	FRZ-001483
37 mm	FRZ-001224	FRZ-001278	FRZ-001381	FRZ-001484
38 mm	FRZ-001225	FRZ-001279	FRZ-001382	FRZ-001485
39 mm	FRZ-001226	FRZ-001280	FRZ-001383	FRZ-001486
40 mm	FRZ-001227	FRZ-001281	FRZ-001384	FRZ-001487
41 mm	FRZ-001228	FRZ-001282	FRZ-001385	FRZ-001488
42 mm	FRZ-001229	FRZ-001283	FRZ-001386	FRZ-001489
43 mm	FRZ-001230	FRZ-001284	FRZ-001387	FRZ-001490
44 mm	FRZ-001231	FRZ-001285	FRZ-001388	FRZ-001491
45 mm	FRZ-001232	FRZ-001286	FRZ-001389	FRZ-001492
46 mm	FRZ-001233	FRZ-001287	FRZ-001390	FRZ-001493
47 mm	FRZ-001234	FRZ-001288	FRZ-001391	FRZ-001494
48 mm	FRZ-001235	FRZ-001289	FRZ-001392	FRZ-001495
49 mm	FRZ-001236	FRZ-001290	FRZ-001393	FRZ-001496
50 mm	FRZ-001237	FRZ-001291	FRZ-001394	FRZ-001497
51 mm	FRZ-001238	FRZ-001292	FRZ-001395	FRZ-001498
52 mm	FRZ-001239	FRZ-001293	FRZ-001396	FRZ-001499
53 mm	FRZ-001240	FRZ-001294	FRZ-001397	FRZ-001500
54 mm	FRZ-001241	FRZ-001295	FRZ-001398	FRZ-001501
55 mm	FRZ-001242	FRZ-001296	FRZ-001399	FRZ-001502
56 mm	FRZ-001243	FRZ-001297	FRZ-001400	FRZ-001503
57 mm	FRZ-001244	FRZ-001298	FRZ-001401	FRZ-001504
58 mm	FRZ-001245	FRZ-001299	FRZ-001402	FRZ-001505
59 mm	FRZ-001246	FRZ-001300	FRZ-001403	FRZ-001506
60 mm	FRZ-001247	FRZ-001301	FRZ-001404	FRZ-001507
61 mm	FRZ-001248	FRZ-001302	FRZ-001405	FRZ-001508
62 mm	FRZ-001249	FRZ-001303	FRZ-001406	FRZ-001509
63 mm	FRZ-001250	FRZ-001304	FRZ-001407	FRZ-001510
64 mm	FRZ-001251	FRZ-001305	FRZ-001408	FRZ-001511
65 mm	FRZ-001252	FRZ-001306	FRZ-001409	FRZ-001512

TCT Metric Annular Cutters			
Dia- meter Metric	50 mm D.O.C. Product Code	75 mm D.O.C. Product Code	100 mm D.O.C. Product Code
66 mm	FRZ-001307	FRZ-001410	FRZ-001513
67 mm	FRZ-001308	FRZ-001411	FRZ-001514
68 mm	FRZ-001309	FRZ-001412	FRZ-001515
69 mm	FRZ-001310	FRZ-001413	FRZ-001516
70 mm	FRZ-001311	FRZ-001414	FRZ-001517
71 mm	FRZ-001312	FRZ-001415	FRZ-001518
72 mm	FRZ-001313	FRZ-001416	FRZ-001519
73 mm	FRZ-001314	FRZ-001417	FRZ-001520
74 mm	FRZ-001315	FRZ-001418	FRZ-001521
75 mm	FRZ-001316	FRZ-001419	FRZ-001522
76 mm	FRZ-001317	FRZ-001420	FRZ-001523
77 mm	FRZ-001318	FRZ-001421	FRZ-001524
78 mm	FRZ-001319	FRZ-001422	FRZ-001525
79 mm	FRZ-001320	FRZ-001423	FRZ-001526
80 mm	FRZ-001321	FRZ-001424	FRZ-001527
81 mm	FRZ-001322	FRZ-001425	FRZ-001528
82 mm	FRZ-001323	FRZ-001426	FRZ-001529
83 mm	FRZ-001324	FRZ-001427	FRZ-001530
84 mm	FRZ-001325	FRZ-001428	FRZ-001531
85 mm	FRZ-001326	FRZ-001429	FRZ-001532
86 mm	FRZ-001327	FRZ-001430	FRZ-001533
87 mm	FRZ-001328	FRZ-001431	FRZ-001534
88 mm	FRZ-001329	FRZ-001432	FRZ-001535
89 mm	FRZ-001330	FRZ-001433	FRZ-001536
90 mm	FRZ-001331	FRZ-001434	FRZ-001537
91 mm	FRZ-001332	FRZ-001435	FRZ-001538
92 mm	FRZ-001333	FRZ-001436	FRZ-001539
93 mm	FRZ-001334	FRZ-001437	FRZ-001540
94 mm	FRZ-001335	FRZ-001438	FRZ-001541
95 mm	FRZ-001336	FRZ-001439	FRZ-001542
96 mm	FRZ-001337	FRZ-001440	FRZ-001543
97 mm	FRZ-001338	FRZ-001441	FRZ-001544
98 mm	FRZ-001339	FRZ-001442	FRZ-001545
99 mm	FRZ-001340	FRZ-001443	FRZ-001546
100 mm	FRZ-001341	FRZ-001444	FRZ-001547
101 mm	FRZ-001342	FRZ-001445	FRZ-001548
102 mm	FRZ-001343	FRZ-001446	FRZ-001549
103 mm	FRZ-001344	FRZ-001447	FRZ-001550
104 mm	FRZ-001345	FRZ-001448	FRZ-001551
105 mm	FRZ-001346	FRZ-001449	FRZ-001552
106 mm	FRZ-001347	FRZ-001450	FRZ-001553
107 mm	FRZ-001348	FRZ-001451	FRZ-001554
108 mm	FRZ-001349	FRZ-001452	FRZ-001555
109 mm	FRZ-001350	FRZ-001453	FRZ-001556
110 mm	FRZ-001351	FRZ-001454	FRZ-001557
115 mm	FRZ-001352	FRZ-001455	FRZ-001558
120 mm	FRZ-001353	FRZ-001456	FRZ-001559
125 mm	FRZ-001354	FRZ-001457	FRZ-001560
130 mm	FRZ-001355	FRZ-001458	FRZ-001561
135 mm	FRZ-001356	FRZ-001459	FRZ-001562
140 mm	FRZ-001357	FRZ-001460	FRZ-001563
145 mm	FRZ-001358	FRZ-001461	FRZ-001564
150 mm	FRZ-001359	FRZ-001462	FRZ-001565
155 mm	FRZ-001360	FRZ-001463	FRZ-001566
160 mm	FRZ-001361	FRZ-001464	FRZ-001567

TCT Rail		TCT Rail HD
Dia- meter Metric	25 mm D.O.C. Product Code	25 mm D.O.C. Product Code
13.5 mm	N/A	FRZ-001587
18 mm	FRZ-001568	FRZ-001588
19 mm	FRZ-001569	FRZ-001589
20 mm	FRZ-001570	FRZ-001590
21 mm	FRZ-001571	FRZ-001591
22 mm	FRZ-001572	FRZ-001592
23 mm	FRZ-001573	FRZ-001593
24 mm	FRZ-001574	FRZ-001594
25 mm	FRZ-001575	FRZ-001595
26 mm	FRZ-001576	FRZ-001596
27 mm	FRZ-001577	FRZ-001597
28 mm	FRZ-001578	FRZ-001598
29 mm	FRZ-001579	FRZ-001599
30 mm	FRZ-001580	FRZ-001600
31 mm	FRZ-001581	FRZ-001601
32 mm	FRZ-001582	FRZ-001602
33 mm	FRZ-001583	FRZ-001603
34 mm	FRZ-001584	FRZ-001604
35 mm	FRZ-001585	FRZ-001605
36 mm	FRZ-001586	FRZ-001606



HSS Annular Cutter



TCT Annular Cutter

Pilot Pin Size	Matching HSS Metric Cutters	Product Code
Ø6.34/5.3 x 77 mm	Ø12 - 65 mm with 25 mm D.O.C.	PLT-000100
Ø6.34/5.3 x 102 mm	Ø12 - 65 mm with 50 mm D.O.C.	PLT-000101
Ø7.98 x 130 mm	Ø18 - 65 mm with 75 mm D.O.C.	PLT-000102
Ø7.98 x 160 mm	Ø18 - 60 mm with 100 mm D.O.C.	PLT-000103