

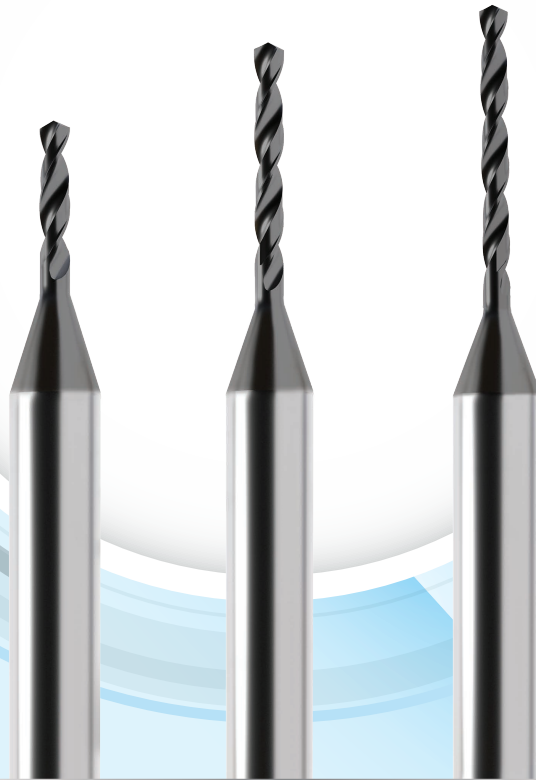


INDRILL⁺

ø 0.30 - 3.00 mm

MMP[®]
TECHNOLOGY

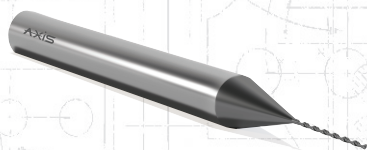
Embedded



T311-SN

T312-SN

T313-SN



SS

Titanium Alloy

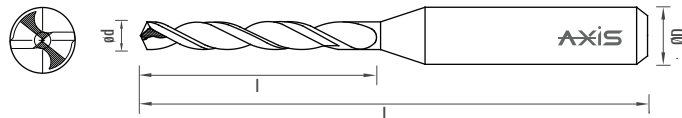
Steel High Alloyed

Nickel Alloy

Steel Low/Unalloyed

Cast Iron

Non-Ferrous



ød h6	ØD h6	T311-SN Stub Length		T312-SN Standard Length		T313-SN Long Length	
		l	L	l	L	l	L
0.30	3.00	1.5	38	3.0	38	5.5	38
0.31	3.00	1.5	38	3.0	38	5.5	38
0.32	3.00	1.5	38	3.0	38	5.5	38
0.33	3.00	1.5	38	3.0	38	5.5	38
0.34	3.00	1.5	38	3.0	38	5.5	38
0.35	3.00	1.5	38	3.0	38	5.5	38
0.36	3.00	1.5	38	3.0	38	5.5	38
0.37	3.00	1.5	38	3.0	38	5.5	38
0.38	3.00	1.5	38	3.0	38	5.5	38
0.39	3.00	1.5	38	3.0	38	5.5	38
0.40	3.00	1.5	38	3.0	38	6.0	38
0.41	3.00	2.0	38	4.0	38	6.0	38
0.42	3.00	2.0	38	4.0	38	6.0	38
0.43	3.00	2.0	38	4.0	38	6.0	38
0.44	3.00	2.0	38	4.0	38	6.0	38
0.45	3.00	2.0	38	4.0	38	6.0	38
0.46	3.00	2.0	38	4.0	38	6.0	38
0.47	3.00	2.0	38	4.0	38	6.0	38
0.48	3.00	2.0	38	4.0	38	6.0	38
0.49	3.00	2.0	38	4.0	38	6.0	38
0.50	3.00	2.0	38	4.0	38	6.0	38
0.51	3.00	2.5	38	4.0	38	6.0	38
0.52	3.00	2.5	38	4.0	38	6.0	38
0.53	3.00	2.5	38	4.0	38	6.0	38
0.54	3.00	2.5	38	4.0	38	6.0	38
0.55	3.00	2.5	38	5.0	38	8.0	38
0.56	3.00	2.5	38	5.0	38	8.0	38
0.57	3.00	2.5	38	5.0	38	8.0	38
0.58	3.00	2.5	38	5.0	38	8.0	38
0.59	3.00	2.5	38	5.0	38	8.0	38
0.60	3.00	2.5	38	5.0	38	8.0	38
0.61	3.00	2.5	38	5.0	38	8.0	38
0.62	3.00	2.5	38	5.0	38	8.0	38
0.63	3.00	2.5	38	5.0	38	8.0	38
0.64	3.00	2.5	38	5.0	38	8.0	38
0.65	3.00	2.5	38	5.0	38	8.0	38
0.66	3.00	2.5	38	5.0	38	8.0	38
0.67	3.00	3.0	38	5.0	38	8.0	38
0.68	3.00	3.0	38	5.0	38	8.0	38
0.69	3.00	3.0	38	5.0	38	8.0	38
0.70	3.00	3.0	38	5.0	38	8.0	38
0.71	3.00	3.0	38	5.0	38	8.0	38
0.72	3.00	3.0	38	5.0	38	8.0	38
0.73	3.00	3.0	38	5.0	38	8.0	38
0.74	3.00	3.0	38	5.0	38	8.0	38
0.75	3.00	3.0	38	5.0	38	8.0	38
0.76	3.00	3.0	38	5.0	38	8.0	38
0.77	3.00	3.0	38	5.0	38	8.0	38
0.78	3.00	3.0	38	5.0	38	8.0	38
0.79	3.00	3.0	38	5.0	38	8.0	38
0.80	3.00	4.0	38	6.0	38	8.0	38
0.81	3.00	4.0	38	6.0	38	8.0	38
0.82	3.00	4.0	38	6.0	38	8.0	38
0.83	3.00	4.0	38	6.0	38	8.0	38
0.84	3.00	4.0	38	6.0	38	8.0	38
0.85	3.00	4.0	38	6.0	38	8.0	38
0.86	3.00	4.0	38	6.0	38	8.0	38
0.87	3.00	4.0	38	6.0	38	8.0	38
0.88	3.00	4.0	38	6.0	38	8.0	38
0.89	3.00	4.0	38	6.0	38	8.0	38

		T311-SN Stub Length		T312-SN Standard Length		T313-SN Long Length	
ød	OD h6	I	L	I	L	I	L
0.90	3.00	5.0	38	6.0	38	8.0	38
0.91	3.00	5.0	38	8.0	38	10.0	38
0.92	3.00	5.0	38	8.0	38	10.0	38
0.93	3.00	5.0	38	8.0	38	10.0	38
0.94	3.00	5.0	38	8.0	38	10.0	38
0.95	3.00	5.0	38	8.0	38	10.0	38
0.96	3.00	5.0	38	8.0	38	10.0	38
0.97	3.00	5.0	38	8.0	38	10.0	38
0.98	3.00	5.0	38	8.0	38	10.0	38
0.99	3.00	5.0	38	8.0	38	10.0	38
1.00	3.00	5.0	38	8.0	38	10.0	38
1.01	3.00	5.0	38	8.0	38	10.0	38
1.02	3.00	5.0	38	8.0	38	10.0	38
1.03	3.00	5.0	38	8.0	38	10.0	38
1.04	3.00	5.0	38	8.0	38	10.0	38
1.05	3.00	5.0	38	8.0	38	10.0	38
1.06	3.00	5.0	38	8.0	38	10.0	38
1.07	3.00	5.0	38	8.0	38	10.0	38
1.08	3.00	5.0	38	8.0	38	10.0	38
1.09	3.00	5.0	38	8.0	38	10.0	38
1.10	3.00	6.0	38	10.0	38	12.0	38
1.11	3.00	6.0	38	10.0	38	12.0	38
1.12	3.00	6.0	38	10.0	38	12.0	38
1.13	3.00	6.0	38	10.0	38	12.0	38
1.14	3.00	6.0	38	10.0	38	12.0	38
1.15	3.00	6.0	38	10.0	38	12.0	38
1.16	3.00	6.0	38	10.0	38	12.0	38
1.17	3.00	6.0	38	10.0	38	12.0	38
1.18	3.00	6.0	38	10.0	38	12.0	38
1.19	3.00	6.0	38	10.0	38	12.0	38
1.20	3.00	6.0	38	10.0	38	12.0	38
1.21	3.00	6.0	38	10.0	38	12.0	38
1.22	3.00	6.0	38	10.0	38	12.0	38
1.23	3.00	6.0	38	10.0	38	12.0	38
1.24	3.00	6.0	38	10.0	38	12.0	38
1.25	3.00	6.0	38	10.0	38	12.0	38
1.26	3.00	6.0	38	10.0	38	12.0	38
1.27	3.00	6.0	38	10.0	38	12.0	38
1.28	3.00	6.0	38	10.0	38	12.0	38
1.29	3.00	6.0	38	10.0	38	12.0	38
1.30	3.00	6.0	38	10.0	38	14.0	45
1.31	3.00	6.0	38	10.0	38	14.0	45
1.32	3.00	6.0	38	10.0	38	14.0	45
1.33	3.00	6.0	38	10.0	38	14.0	45
1.34	3.00	6.0	38	10.0	38	14.0	45
1.35	3.00	6.0	38	10.0	38	14.0	45
1.36	3.00	6.0	38	10.0	38	14.0	45
1.37	3.00	6.0	38	10.0	38	14.0	45
1.38	3.00	6.0	38	10.0	38	14.0	45
1.39	3.00	6.0	38	10.0	38	14.0	45
1.40	3.00	6.0	38	10.0	38	14.0	45
1.41	3.00	6.0	38	10.0	38	14.0	45
1.42	3.00	6.0	38	10.0	38	14.0	45
1.43	3.00	6.0	38	10.0	38	14.0	45
1.44	3.00	6.0	38	10.0	38	14.0	45
1.45	3.00	6.0	38	10.0	38	14.0	45
1.46	3.00	6.0	38	10.0	38	14.0	45
1.47	3.00	6.0	38	10.0	38	14.0	45
1.48	3.00	6.0	38	10.0	38	14.0	45
1.49	3.00	6.0	38	10.0	38	14.0	45
1.50	3.00	8.0	38	12.0	38	16.0	45
1.51	3.00	8.0	38	12.0	38	16.0	45
1.52	3.00	8.0	38	12.0	38	16.0	45
1.53	3.00	8.0	38	12.0	38	16.0	45
1.54	3.00	8.0	38	12.0	38	16.0	45
1.55	3.00	8.0	38	12.0	38	16.0	45
1.56	3.00	8.0	38	12.0	38	16.0	45
1.57	3.00	8.0	38	12.0	38	16.0	45
1.58	3.00	8.0	38	12.0	38	16.0	45
1.59	3.00	8.0	38	12.0	38	16.0	45
1.60	3.00	8.0	38	12.0	38	16.0	45
1.61	3.00	8.0	38	12.0	38	16.0	45
1.62	3.00	8.0	38	12.0	38	16.0	45
1.63	3.00	8.0	38	12.0	38	16.0	45
1.64	3.00	8.0	38	12.0	38	16.0	45
1.65	3.00	8.0	38	12.0	38	16.0	45
1.66	3.00	8.0	38	12.0	38	16.0	45
1.67	3.00	8.0	38	12.0	38	16.0	45

		T311-SN Stub Length		T312-SN Standard Length		T313-SN Long Length	
ød	ØD h6	I	L	I	L	I	L
1.68	3.00	8.0	38	12.0	38	16.0	45
1.69	3.00	8.0	38	12.0	38	16.0	45
1.70	3.00	8.0	38	12.0	38	18.0	45
1.71	3.00	8.0	38	12.0	38	18.0	45
1.72	3.00	8.0	38	12.0	38	18.0	45
1.73	3.00	8.0	38	12.0	38	18.0	45
1.74	3.00	8.0	38	12.0	38	18.0	45
1.75	3.00	8.0	38	12.0	38	18.0	45
1.76	3.00	8.0	38	12.0	38	18.0	45
1.77	3.00	8.0	38	12.0	38	18.0	45
1.78	3.00	8.0	38	12.0	38	18.0	45
1.79	3.00	8.0	38	12.0	38	18.0	45
1.80	3.00	8.0	38	12.0	38	18.0	45
1.81	3.00	8.0	38	12.0	38	18.0	45
1.82	3.00	8.0	38	12.0	38	18.0	45
1.83	3.00	8.0	38	12.0	38	18.0	45
1.84	3.00	8.0	38	12.0	38	18.0	45
1.85	3.00	8.0	38	12.0	38	18.0	45
1.86	3.00	8.0	38	12.0	38	18.0	45
1.87	3.00	8.0	38	12.0	38	18.0	45
1.88	3.00	8.0	38	12.0	38	18.0	45
1.89	3.00	8.0	38	12.0	38	18.0	45
1.90	3.00	8.0	38	12.0	38	18.0	45
1.91	3.00	8.0	38	12.0	38	18.0	45
1.92	3.00	8.0	38	12.0	38	18.0	45
1.93	3.00	8.0	38	12.0	38	18.0	45
1.94	3.00	8.0	38	12.0	38	18.0	45
1.95	3.00	8.0	38	12.0	38	18.0	45
1.96	3.00	8.0	38	12.0	38	18.0	45
1.97	3.00	8.0	38	12.0	38	18.0	45
1.98	3.00	8.0	38	12.0	38	18.0	45
1.99	3.00	8.0	38	12.0	38	18.0	45
2.00	3.00	8.0	38	12.0	38	18.0	45
2.01	3.00	12.0	38	14.0	45	20.0	50
2.02	3.00	12.0	38	14.0	45	20.0	50
2.03	3.00	12.0	38	14.0	45	20.0	50
2.04	3.00	12.0	38	14.0	45	20.0	50
2.05	3.00	12.0	38	14.0	45	20.0	50
2.06	3.00	12.0	38	14.0	45	20.0	50
2.07	3.00	12.0	38	14.0	45	20.0	50
2.08	3.00	12.0	38	14.0	45	20.0	50
2.09	3.00	12.0	38	14.0	45	20.0	50
2.10	3.00	12.0	38	14.0	45	20.0	50
2.11	3.00	12.0	38	14.0	45	20.0	50
2.12	3.00	12.0	38	14.0	45	20.0	50
2.13	3.00	12.0	38	14.0	45	20.0	50
2.14	3.00	12.0	38	14.0	45	20.0	50
2.15	3.00	12.0	38	14.0	45	20.0	50
2.16	3.00	12.0	38	14.0	45	20.0	50
2.17	3.00	12.0	38	14.0	45	20.0	50
2.18	3.00	12.0	38	14.0	45	20.0	50
2.19	3.00	12.0	38	14.0	45	20.0	50
2.20	3.00	12.0	38	14.0	45	20.0	50
2.21	3.00	12.0	38	14.0	45	20.0	50
2.22	3.00	12.0	38	14.0	45	20.0	50
2.23	3.00	12.0	38	14.0	45	20.0	50
2.24	3.00	12.0	38	14.0	45	20.0	50
2.25	3.00	12.0	38	14.0	45	20.0	50
2.26	3.00	12.0	38	14.0	45	22.0	50
2.27	3.00	12.0	38	14.0	45	22.0	50
2.28	3.00	12.0	38	14.0	45	22.0	50
2.29	3.00	12.0	38	14.0	45	22.0	50
2.30	3.00	12.0	38	14.0	45	22.0	50
2.31	3.00	12.0	38	14.0	45	22.0	50
2.32	3.00	12.0	38	14.0	45	22.0	50
2.33	3.00	12.0	38	14.0	45	22.0	50
2.34	3.00	12.0	38	14.0	45	22.0	50
2.35	3.00	12.0	38	14.0	45	22.0	50
2.36	3.00	12.0	38	14.0	45	22.0	50
2.37	3.00	12.0	38	14.0	45	22.0	50
2.38	3.00	12.0	38	14.0	45	22.0	50
2.39	3.00	12.0	38	14.0	45	22.0	50
2.40	3.00	12.0	38	14.0	45	22.0	50
2.41	3.00	12.0	38	16.0	45	22.0	50
2.42	3.00	12.0	38	16.0	45	22.0	50
2.43	3.00	12.0	38	16.0	45	22.0	50
2.44	3.00	12.0	38	16.0	45	22.0	50
2.45	3.00	12.0	38	16.0	45	22.0	50

		T311-SN Stub Length		T312-SN Standard Length		T313-SN Long Length	
ød	ØD h6	I	L	I	L	I	L
2.46	3.00	12.0	38	16.0	45	22.0	50
2.47	3.00	12.0	38	16.0	45	22.0	50
2.48	3.00	12.0	38	16.0	45	22.0	50
2.49	3.00	12.0	38	16.0	45	22.0	50
2.50	3.00	12.0	38	16.0	45	24.0	50
2.51	3.00	12.0	38	16.0	45	24.0	50
2.52	3.00	12.0	38	16.0	45	24.0	50
2.53	3.00	12.0	38	16.0	45	24.0	50
2.54	3.00	12.0	38	16.0	45	24.0	50
2.55	3.00	12.0	38	16.0	45	24.0	50
2.56	3.00	12.0	38	16.0	45	24.0	50
2.57	3.00	12.0	38	16.0	45	24.0	50
2.58	3.00	12.0	38	16.0	45	24.0	50
2.59	3.00	12.0	38	16.0	45	24.0	50
2.60	3.00	12.0	38	16.0	45	24.0	50
2.61	3.00	12.0	38	16.0	45	24.0	50
2.62	3.00	12.0	38	16.0	45	24.0	50
2.63	3.00	12.0	38	16.0	45	24.0	50
2.64	3.00	12.0	38	16.0	45	24.0	50
2.65	3.00	12.0	38	16.0	45	24.0	50
2.66	3.00	12.0	38	16.0	45	24.0	50
2.67	3.00	12.0	38	16.0	45	24.0	50
2.68	3.00	12.0	38	16.0	45	24.0	50
2.69	3.00	12.0	38	16.0	45	24.0	50
2.70	3.00	12.0	38	16.0	45	24.0	50
2.71	3.00	12.0	38	18.0	45	26.0	50
2.72	3.00	12.0	38	18.0	45	26.0	50
2.73	3.00	12.0	38	18.0	45	26.0	50
2.74	3.00	12.0	38	18.0	45	26.0	50
2.75	3.00	12.0	38	18.0	45	26.0	50
2.76	3.00	12.0	38	18.0	45	26.0	50
2.77	3.00	12.0	38	18.0	45	26.0	50
2.78	3.00	12.0	38	18.0	45	26.0	50
2.79	3.00	12.0	38	18.0	45	26.0	50
2.80	3.00	12.0	38	18.0	45	26.0	50
2.81	3.00	12.0	38	18.0	45	26.0	50
2.82	3.00	12.0	38	18.0	45	26.0	50
2.83	3.00	12.0	38	18.0	45	26.0	50
2.84	3.00	12.0	38	18.0	45	26.0	50
2.85	3.00	12.0	38	18.0	45	26.0	50
2.86	3.00	12.0	38	18.0	45	26.0	50
2.87	3.00	12.0	38	18.0	45	26.0	50
2.88	3.00	12.0	38	18.0	45	26.0	50
2.89	3.00	12.0	38	18.0	45	26.0	50
2.90	3.00	12.0	38	18.0	45	26.0	50
2.91	3.00	12.0	38	18.0	45	26.0	50
2.92	3.00	12.0	38	18.0	45	26.0	50
2.93	3.00	12.0	38	18.0	45	26.0	50
2.94	3.00	12.0	38	18.0	45	26.0	50
2.95	3.00	12.0	38	18.0	45	26.0	50
2.96	3.00	12.0	38	18.0	45	26.0	50
2.97	3.00	12.0	38	18.0	45	26.0	50
2.98	3.00	12.0	38	18.0	45	26.0	50
2.99	3.00	12.0	38	18.0	45	26.0	50
3.00	3.00	12.0	38	18.0	45	26.0	50

Machining Parameters

Materials			Dia Range		
			0.30-0.40	0.41-0.50	0.51-0.70
P	Low/Unalloyed Steel <600 N/mm ²	N min-1	20000-19000	29000-18000	18000-17000
		F mm/rev	0.010-0.015	0.015-0.020	0.020-0.030
	Low/Unalloyed Steel 600-1000 N/mm ²	N min-1	20000-19000	29000-18000	18000-17000
		F mm/rev	0.010-0.015	0.015-0.020	0.020-0.030
	High Alloyed Steel 700-1500 N/mm ²	N min-1	18000-17000	17000-15000	15000-12000
		F mm/rev	0.010-0.015	0.015-0.020	0.020-0.030
M	Ferritic/Martensitic	N min-1	16500-15700	15700-14000	13500-10000
		F mm/rev	0.004-0.005	0.005-0.008	0.008-0.014
	Austenitic	N min-1	16500-15700	15700-14000	13500-10000
		F mm/rev	0.004-0.005	0.005-0.008	0.008-0.012
	Duplex/PH > 800 N/mm ²	N min-1	16500-15700	15700-14000	13500-10000
		F mm/rev	0.004-0.005	0.005-0.008	0.008-0.012
K	GCI/NCI <180 BHN	N min-1	20000-19000	29000-18000	18000-17000
		F mm/rev	0.01-0.015	0.015-0.020	0.02-0.030
	GCI/NCI 200-250 BHN	N min-1	17000-16000	15700-14000	14000-12000
		F mm/rev	0.01-0.015	0.015-0.020	0.020-0.030
S	Ti - Based	N min-1	7500-7000	7000-6500	6500-6000
		F mm/rev	0.004-0.005	0.005-0.008	0.008-0.014
	Fe, Ni, Co - Based	N min-1	7000-6500	6500-6000	6000-5600
		F mm/rev	0.004-0.005	0.005-0.008	0.008-0.012

Dia D (mm)	0.30-0.50	0.51-3.00
Peck Depth (mm)	(0.2-0.3)xd	0.5xd

Dia Range				
0.71-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00
17000-15000	15000-12000	12000-10000	10000-8000	8000-7000
0.030-0.040	0.040-0.050	0.050-0.060	0.060-0.075	0.075-0.090
17000-15000	15000-12000	12000-10000	10000-8000	8000-7000
0.030-0.040	0.040-0.050	0.050-0.060	0.060-0.075	0.075-0.090
12000-10000	10000-9000	9000-7000	7000-6000	6000-5000
0.030-0.040	0.040-0.050	0.050-0.060	0.060-0.075	0.075-0.090
9000-7000	7000-6000	6000-5000	5000-4000	4000-3000
0.015-0.020	0.020-0.025	0.025-0.027	0.027-0.030	0.030-0.035
9000-7000	7000-6000	6000-5000	5000-4000	4000-3000
0.015-0.020	0.018-0.022	0.022-0.024	0.024-0.027	0.028-0.032
9000-7000	7000-6000	6000-5000	5000-4000	4000-3000
0.015-0.020	0.018-0.022	0.022-0.024	0.024-0.027	0.028-0.032
17000-15000	15000-12000	12000-10000	10000-8000	8000-7000
0.030-0.040	0.040-0.050	0.050-0.060	0.060-0.070	0.070-0.080
11500-10000	9500-8000	8000-7000	7000-6000	6000-5000
0.030-0.040	0.040-0.050	0.050-0.060	0.060-0.070	0.070-0.080
6000-5600	5600-5000	5000-4000	4000-3000	3000-2500
0.015-0.020	0.020-0.025	0.025-0.027	0.027-0.030	0.030-0.035
5600-5000	5000-4000	4000-3000	3000-2500	2500-2200
0.015-0.020	0.018-0.022	0.022-0.024	0.024-0.027	0.028-0.032

* When machines can not achieve a recommended rotation speed, please set maximum speed but in stable rotation and adjust the feed rate.

* For smaller drills under $\phi 0.5$, the most stable rotation speed of the spindle takes precedence over the recommended conditions indicated in the table.



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