



FORCE M
FORCE X

**High performance
solid carbide drills**

2018



FORCE M
FORCE X



The Force program of solid carbide drills provides excellent levels of performance with outstanding economy.

The range consists of:

FORCE X – versatile solid carbide drills suitable for use in a wide range of materials.

NEW FORCE M – a new addition to the Force range designed specifically for stainless steel drilling applications.

OVERVIEW

- These drills are problem solvers, **providing high productivity and consistent performance and repeatability** in multi applications across diverse machines and conditions. This makes them the ideal choice for general engineering and sub-contract environments.
- Modified 4-facet split point **improves chip formation, strength and wear-resistance.**
- Consistent edge preparation provides **predictable wear** and operator confidence.
- The family offers ranges of TiAlN coated drills in a variety of lengths, in solid and coolant feed variants.

FORCE M **NEW**

- The new Force M drills are ideally suited for high performance drilling of large numbers of holes in ISO M materials.

MATERIAL


- **Premium Micrograin Carbide**
Micrograin carbide provides an excellent combination of hardness and toughness, resulting in high wear resistance and longer tool life.

COATING

Multi-layer Titanium Aluminium Nitride (TiAlN)

- Improved cutting edge stability
- Outstanding wear protection
- High hardness at high temperature
- Increased tool life and productivity

GEOMETRY

- **CTW Flute Construction** 
Continuously Thinned Web technology provides a very strong web design whilst at the same time reducing thrust forces during drilling.
- **Edge Preparation**
A consistent edge preparation protects the cutting edges and prevents premature chipping and flaking.
- **Corner Design**
A strong corner design increases stability during drilling and reduces the forces encountered during breakthrough of the exit surface in both general drilling and cross hole drilling applications.
- **Point Geometry**
4-facet split-point, which enhances self-centering and hole quality. Furthermore, the chisel edge angle is increased, which gives a more obtuse angle between the secondary chisel-edge and the main cutting-edge. This significantly increases the strength and wear-resistance of the design, whilst also improving chip formation.

FORCE M **NEW**

- An advanced point geometry prevents premature wear of the cutting edges.

SHANK

DIN 6535 HA

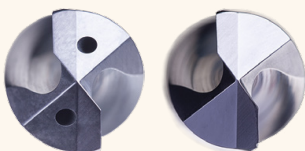
- High precision shank (h6) to reduce run-out and vibration, improving performance and hole quality.
- Many diameters on common shank to reduce tool holding costs.

FORCE

HIGH PERFORMANCE SOLID CARBIDE DRILLS



MULTI MATERIAL



FORCE X

- 3xD, 5xD and 8xD
- Internal coolant or solid (3xD & 5xD only) versions
- 3 mm to 20 mm
- 1/8 to 3/4 inch
- N1 to N30
- A to Z

STAINLESS STEEL



NEW

FORCE M

- 3xD and 5xD
- Internal coolant
- 3 mm to 16 mm
- 1/8 to 5/8 inch

	 FORCE X R458 3.00 - 20.00	 FORCE X R457 3.00 - 20.00	 FORCE X R454 3.00 - 20.00	 FORCE X R453 3.00 - 20.00	 FORCE X R459 3.00 - 16.00	 FORCE M R467 3.00 - 16.00 NEW	 FORCE M R463 3.00 - 16.00 NEW	
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AMG								ISO
1.1	■155W	■155W	■155V	■155V	■135V			P 1
1.2	■135W	■140W	■135V	■140V	■120V			P 1
1.3	■110W	■135W	■110V	■135V	■110U			P 2
1.4	■100V	■115V	■100V	■115V	■100U			P 3
1.5	■75V	■90V	■75V	■90V	■80U			P 4
1.6	■50U	■65U	■50U	■65U	■55T			H 1
1.7	■30U	■30U	■30U	■30U				H 3
1.8	■25U	■25U	■25U	■25U				H 4
2.1	■45U	■55V	■45U	■55V	■75V	■85G	■85G	M 1
2.2	■40T	■35V	■40T	■35V	■35V	■75G	■75G	M 3
2.3	■35T	■30U	■35T	●30U	●30U	■60F	■60F	M 2
2.4	●35T		●35T	●30U		■60E	■60E	S 2
3.1	■90W	■110W	■90W	■110W	■120W			K 1
3.2	■90W	■110W	■90W	■110W	■120W			K 2
3.3	■70V	■80V	■70V	■80V	■80V			K 3
3.4	■70V	■80V	■70V	■80V	■80V			K 4
4.1	●50U	■55V	●50U	■55V		■55V	■55V	S 1
4.2	●40U	■45V	●40U	■45V		■45V	■45V	S 2
4.3	●35T	■40U	●35T	■40U		■40U	■40U	S 3
5.1						●55U	●55U	S 1
5.2						●45U	●45U	S 2
5.3						●40U	●40U	S 3
6.1	■100V	■125W	■100V	■125W	●125V			N 3
6.2	■200V	■220W	■200V	■220W	●220V			N 3
6.3	■200V	■220W	■200V	■220W	●220V			N 3
6.4	●80U	■100V	●80U	■100V	●100U			N 4
7.1	■225W	■250W	■225W	■250W	●285W			N 1
7.2	■225W	■250W	■225W	■250W	■285W			N 1
7.3	■180V	■200V	■180V	■200V				N 1
7.4	■120V	■150V	■120V	■150V	■95V			N 2
8.1								O
8.2								O
8.3								O
9.1								H
10.1								O



HM

	∅ (D) [mm]											
	1	2	3	4	5	6	8	10	12	15	16	20
E	0,017	0,043	0,062	0,071	0,080	0,092	0,115	0,140	0,150	0,173	0,180	0,215
F	0,018	0,050	0,073	0,084	0,095	0,109	0,138	0,165	0,178	0,202	0,210	0,248
G	0,019	0,056	0,084	0,096	0,109	0,126	0,160	0,190	0,205	0,231	0,240	0,280
T	0,015	0,028	0,040	0,050	0,060	0,070	0,090	0,110	0,130	0,160	0,170	0,190
U	0,026	0,048	0,070	0,080	0,090	0,107	0,140	0,170	0,200	0,223	0,230	0,240
V	0,038	0,069	0,100	0,115	0,130	0,153	0,200	0,250	0,280	0,310	0,320	0,340
W	0,049	0,089	0,130	0,150	0,170	0,200	0,260	0,330	0,380	0,418	0,430	0,450
mm / REV ± 25%												

$$n = \frac{V_c \times 1000}{\pi \times D}$$

$$Vf = n \times fn$$

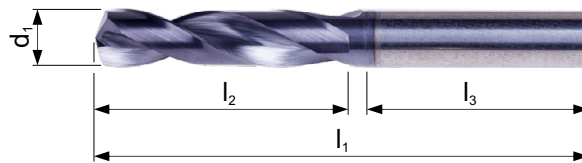
- Excellent for Application
- Good for Application

R458 • Force X Drill 3xD

R457 • Force X Drill Oil Feed 3xD

R458	▪	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	3.1	3.2	3.3	3.4	6.1	6.2	6.3	7.1	7.2
		7.3	7.4																		
	•	2.4	4.1	4.2	4.3	6.4															
R457	▪	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2	4.3	6.1	6.2
		6.3	6.4	7.1	7.2	7.3	7.4														

R458	HM	DIN 6537 K	3XD	140°	TiAIN	DIN 6535HA	CTW			
R457	HM	DIN 6537 K	3XD	140°	TiAIN	DIN 6535HA	CTW			



d_1 \emptyset "/Nr.	d_1 $\emptyset m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	R458	R457
	3.00	0.1181	20	62	36	6	R4583.0	R4573.0
	3.10	0.1220	20	62	36	6	R4583.1	R4573.1
1/8	3.18	0.1250	20	62	36	6	R4581/8	R4571/8
	3.20	0.1260	20	62	36	6	R4583.2	R4573.2
30	3.26	0.1283	20	62	36	6	R458N30	
	3.30	0.1299	20	62	36	6	R4583.3	R4573.3
	3.40	0.1339	20	62	36	6	R4583.4	R4573.4
29	3.45	0.1360	20	62	36	6	R458N29	
	3.50	0.1378	20	62	36	6	R4583.5	R4573.5
28	3.57	0.1406	20	62	36	6	R458N28	
9/64	3.57	0.1406	20	62	36	6	R4589/64	R4579/64
	3.60	0.1417	20	62	36	6	R4583.6	R4573.6
27	3.66	0.1441	20	62	36	6	R458N27	
	3.70	0.1457	20	62	36	6	R4583.7	R4573.7
26	3.73	0.1469	24	66	36	6	R458N26	R457N26
25	3.80	0.1496	24	66	36	6	R4583.8	R4573.8
24	3.86	0.1520	24	66	36	6	R458N24	R457N24
	3.90	0.1535	24	66	36	6	R4583.9	R4573.9
23	3.91	0.1539	24	66	36	6	R458N23	
5/32	3.97	0.1563	24	66	36	6	R4585/32	R4575/32
22	3.99	0.1571	24	66	36	6	R458N22	
	4.00	0.1575	24	66	36	6	R4584.0	R4574.0
21	4.04	0.1591	24	66	36	6	R458N21	
	4.05	0.1594	24	66	36	6		R4574.05
20	4.09	0.1610	24	66	36	6	R458N20	
	4.10	0.1614	24	66	36	6	R4584.1	R4574.1
	4.20	0.1654	24	66	36	6	R4584.2	R4574.2
19	4.22	0.1661	24	66	36	6	R458N19	R457N19

d_1 Ø "/Nr.	d_1 Ø _m , mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Ø _h mm	R458	R457
	4.30	0.1693	24	66	36	6	R4584.3	R4574.3
18	4.31	0.1697	24	66	36	6	R458N18	
11/64	4.37	0.1719	24	66	36	6	R45811/64	R45711/64
17	4.39	0.1728	24	66	36	6	R458N17	R457N17
	4.40	0.1732	24	66	36	6	R4584.4	R4574.4
	4.50	0.1772	24	66	36	6	R4584.5	R4574.5
16	4.50	0.1772	24	66	36	6	R458N16	
15	4.57	0.1799	24	66	36	6	R458N15	R457N15
	4.60	0.1811	24	66	36	6	R4584.6	R4574.6
14	4.62	0.1819	24	66	36	6	R458N14	R457N14
13	4.70	0.1850	24	66	36	6	R4584.7	R4574.7
3/16	4.76	0.1875	28	66	36	6	R4583/16	R4573/16
	4.80	0.1890	28	66	36	6	R4584.8	R4574.8
12	4.80	0.1890	28	66	36	6	R458N12	
11	4.85	0.1909	28	66	36	6	R458N11	
	4.90	0.1929	28	66	36	6	R4584.9	R4574.9
10	4.92	0.1937	28	66	36	6	R458N10	
9	4.98	0.1961	28	66	36	6	R458N9	R457N9
	5.00	0.1969	28	66	36	6	R4585.0	R4575.0
	5.05	0.1988	28	66	36	6		R4575.05
8	5.06	0.1992	28	66	36	6	R458N8	
	5.10	0.2008	28	66	36	6	R4585.1	R4575.1
7	5.11	0.2010	28	66	36	6	R458N7	
13/64	5.16	0.2031	28	66	36	6	R45813/64	R45713/64
6	5.18	0.2039	28	66	36	6	R458N6	
	5.20	0.2047	28	66	36	6	R4585.2	R4575.2
5	5.22	0.2055	28	66	36	6	R458N5	
	5.30	0.2087	28	66	36	6	R4585.3	R4575.3
4	5.31	0.2091	28	66	36	6	R458N4	R457N4
	5.40	0.2126	28	66	36	6	R4585.4	R4575.4
3	5.41	0.2130	28	66	36	6	R458N3	
	5.50	0.2165	28	66	36	6	R4585.5	R4575.5
7/32	5.56	0.2188	28	66	36	6	R4587/32	R4577/32
	5.60	0.2205	28	66	36	6	R4585.6	R4575.6
2	5.61	0.2209	28	66	36	6	R458N2	R457N2
	5.70	0.2244	28	66	36	6	R4585.7	R4575.7
1	5.79	0.2280	28	66	36	6	R458N1	
	5.80	0.2283	28	66	36	6	R4585.8	R4575.8
	5.90	0.2323	28	66	36	6	R4585.9	R4575.9
A	5.94	0.2339	28	66	36	6	R458A	R457A
15/64	5.95	0.2344	28	66	36	6	R45815/64	R45715/64
	6.00	0.2362	28	66	36	6	R4586.0	R4576.0
B	6.05	0.2380	34	79	36	8	R458B	R457B
	6.05	0.2382	34	79	36	8		R4576.05
	6.10	0.2402	34	79	36	8	R4586.1	R4576.1
C	6.15	0.2421	34	79	36	8	R458C	R457C
	6.20	0.2441	34	79	36	8	R4586.2	R4576.2
D	6.25	0.2461	34	79	36	8	R458D	R457D
	6.30	0.2480	34	79	36	8	R4586.3	R4576.3
1/4	6.35	0.2500	34	79	36	8	R4581/4	R4571/4
E	6.35	0.2500	34	79	36	8	R458E	R457E
	6.40	0.2520	34	79	36	8	R4586.4	R4576.4
	6.50	0.2559	34	79	36	8	R4586.5	R4576.5
F	6.53	0.2571	34	79	36	8	R458F	R457F
	6.60	0.2598	34	79	36	8	R4586.6	R4576.6
G	6.63	0.2610	34	79	36	8	R458G	R457G
	6.70	0.2638	34	79	36	8	R4586.7	R4576.7
17/64	6.75	0.2656	34	79	36	8	R45817/64	R45717/64
H	6.76	0.2661	34	79	36	8	R458H	R457H
	6.80	0.2677	34	79	36	8	R4586.8	R4576.8
	6.90	0.2717	34	79	36	8	R4586.9	R4576.9
I	6.91	0.2720	34	79	36	8	R458I	R457I
	7.00	0.2756	34	79	36	8	R4587.0	R4577.0
J	7.04	0.2772	34	79	36	8	R458J	
J	7.04	0.2772	41	79	36	8		R457J
	7.10	0.2795	41	79	36	8	R4587.1	R4577.1
K	7.14	0.2811	41	79	36	8	R458K	R457K
9/32	7.14	0.2813	41	79	36	8	R4589/32	R4579/32
	7.20	0.2835	41	79	36	8	R4587.2	R4577.2
	7.30	0.2874	41	79	36	8	R4587.3	R4577.3

d ₁ ∅ "/Nr.	d ₁ ∅ _{m7} mm	d ₁ decimal Inch	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ ∅ _{h6} mm	R458	R457
L	7.37	0.2902	41	79	36	8	R458L	R457L
	7.40	0.2913	41	79	36	8	R4587.4	R4577.4
M	7.49	0.2949	41	79	36	8	R458M	R457M
	7.50	0.2953	41	79	36	8	R4587.5	R4577.5
19/64	7.54	0.2969	41	79	36	8	R45819/64	R45719/64
	7.60	0.2992	41	79	36	8	R4587.6	R4577.6
N	7.67	0.3020	41	79	36	8	R458N	R457N
	7.70	0.3031	41	79	36	8	R4587.7	R4577.7
	7.80	0.3071	41	79	36	8	R4587.8	R4577.8
	7.90	0.3110	41	79	36	8	R4587.9	R4577.9
5/16	7.94	0.3125	41	79	36	8	R4585/16	R4575/16
	8.00	0.3150	41	79	36	8	R4588.0	R4578.0
O	8.03	0.3161	47	89	40	10	R458O	R457O
	8.05	0.3169	47	89	40	10		R4578.05
	8.10	0.3189	47	89	40	10	R4588.1	R4578.1
	8.20	0.3228	47	89	40	10	R4588.2	R4578.2
P	8.20	0.3228	47	89	40	10	R458P	R457P
	8.30	0.3268	47	89	40	10	R4588.3	R4578.3
21/64	8.33	0.3281	47	89	40	10	R45821/64	R45721/64
	8.40	0.3307	47	89	40	10	R4588.4	R4578.4
Q	8.43	0.3319	47	89	40	10		R457Q
	8.50	0.3346	47	89	40	10	R4588.5	R4578.5
	8.60	0.3386	47	89	40	10	R4588.6	R4578.6
R	8.61	0.3390	47	89	40	10	R458R	R457R
	8.70	0.3425	47	89	40	10	R4588.7	R4578.7
11/32	8.73	0.3438	47	89	40	10	R45811/32	R45711/32
	8.80	0.3465	47	89	40	10	R4588.8	R4578.8
S	8.84	0.3480	47	89	40	10	R458S	R457S
	8.90	0.3504	47	89	40	10	R4588.9	R4578.9
	9.00	0.3543	47	89	40	10	R4589.0	R4579.0
T	9.09	0.3579	47	89	40	10	R458T	R457T
	9.10	0.3583	47	89	40	10	R4589.1	R4579.1
23/64	9.13	0.3594	47	89	40	10	R45823/64	R45723/64
	9.20	0.3622	47	89	40	10	R4589.2	R4579.2
	9.30	0.3661	47	89	40	10	R4589.3	R4579.3
U	9.35	0.3681	47	89	40	10	R458U	
	9.40	0.3701	47	89	40	10	R4589.4	R4579.4
	9.50	0.3740	47	89	40	10	R4589.5	R4579.5
3/8	9.53	0.3750	47	89	40	10	R4583/8	R4573/8
V	9.58	0.3772	47	89	40	10	R458V	R457V
	9.60	0.3780	47	89	40	10	R4589.6	R4579.6
	9.70	0.3819	47	89	40	10	R4589.7	R4579.7
	9.80	0.3858	47	89	40	10	R4589.8	R4579.8
W	9.80	0.3858	47	89	40	10	R458W	R457W
	9.90	0.3898	47	89	40	10	R4589.9	R4579.9
25/64	9.92	0.3906	47	89	40	10	R45825/64	R45725/64
	10.00	0.3937	47	89	40	10	R45810.0	R45710.0
	10.05	0.3957	55	102	45	12		R45710.05
X	10.08	0.3969	55	102	45	12	R458X	R457X
	10.10	0.3976	55	102	45	12	R45810.1	R45710.1
	10.20	0.4016	55	102	45	12	R45810.2	R45710.2
Y	10.26	0.4039	55	102	45	12	R458Y	R457Y
	10.30	0.4055	55	102	45	12	R45810.3	R45710.3
13/32	10.32	0.4063	55	102	45	12	R45813/32	R45713/32
	10.40	0.4094	55	102	45	12	R45810.4	R45710.4
Z	10.49	0.4130	55	102	45	12	R458Z	R457Z
	10.50	0.4134	55	102	45	12	R45810.5	R45710.5
	10.60	0.4173	55	102	45	12	R45810.6	R45710.6
	10.70	0.4213	55	102	45	12	R45810.7	
27/64	10.72	0.4219	55	102	45	12	R45827/64	R45727/64
	10.80	0.4252	55	102	45	12	R45810.8	R45710.8
	10.90	0.4291	55	102	45	12	R45810.9	
	11.00	0.4331	55	102	45	12	R45811.0	R45711.0
	11.10	0.4370	55	102	45	12	R45811.1	
7/16	11.11	0.4375	55	102	45	12	R4587/16	R4577/16
	11.20	0.4409	55	102	45	12	R45811.2	R45711.2
	11.30	0.4449	55	102	45	12	R45811.3	R45711.3
	11.40	0.4488	55	102	45	12	R45811.4	R45711.4
	11.50	0.4528	55	102	45	12	R45811.5	R45711.5
29/64	11.51	0.4531	55	102	45	12	R45829/64	R45729/64

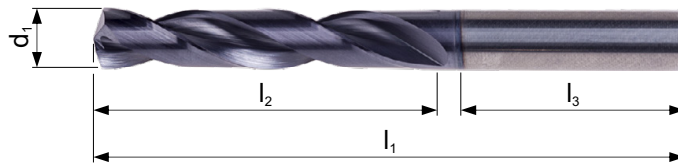
d_1 Ø "/Nr.	d_1 Øm, mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh ₆ mm	R458	R457
	11.60	0.4567	55	102	45	12	R45811.6	R45711.6
	11.70	0.4606	55	102	45	12	R45811.7	
	11.80	0.4646	55	102	45	12	R45811.8	R45711.8
	11.90	0.4685	55	102	45	12	R45811.9	
15/32	11.91	0.4688	55	102	45	12	R45815/32	R45715/32
	12.00	0.4724	55	102	45	12	R45812.0	R45712.0
	12.05	0.4744	60	107	45	14		R45712.05
	12.10	0.4764	60	107	45	14	R45812.1	R45712.1
	12.20	0.4803	60	107	45	14	R45812.2	R45712.2
31/64	12.30	0.4844	60	107	45	14	R45831/64	R45731/64
	12.50	0.4921	60	107	45	14	R45812.5	R45712.5
	12.70	0.5000	60	107	45	14	R45812.7	R45712.7
1/2	12.70	0.5000	60	107	45	14	R4581/2	R4571/2
	12.80	0.5039	60	107	45	14	R45812.8	R45712.8
	13.00	0.5118	60	107	45	14	R45813.0	R45713.0
33/64	13.10	0.5156	60	107	45	14	R45833/64	R45733/64
	13.30	0.5236	60	107	45	14	R45813.3	R45713.3
17/32	13.49	0.5313	60	107	45	14	R45817/32	R45717/32
	13.50	0.5315	60	107	45	14	R45813.5	R45713.5
	13.80	0.5433	60	107	45	14	R45813.8	R45713.8
35/64	13.89	0.5469	60	107	45	14	R45835/64	R45735/64
	14.00	0.5512	60	107	45	14	R45814.0	R45714.0
	14.25	0.5610	65	115	48	16	R45814.25	R45714.25
9/16	14.29	0.5625	65	115	48	16	R4589/16	R4579/16
	14.50	0.5709	65	115	48	16	R45814.5	R45714.5
37/64	14.68	0.5781	65	115	48	16	R45837/64	R45737/64
	14.80	0.5827	65	115	48	16	R45814.8	R45714.8
	15.00	0.5906	65	115	48	16	R45815.0	R45715.0
19/32	15.08	0.5938	65	115	48	16	R45819/32	R45719/32
	15.10	0.5945	65	115	48	16	R45815.1	R45715.1
	15.30	0.6024	65	115	48	16	R45815.3	R45715.3
39/64	15.48	0.6094	65	115	48	16	R45839/64	R45739/64
	15.50	0.6102	65	115	48	16	R45815.5	R45715.5
	15.80	0.6220	65	115	48	16	R45815.8	R45715.8
5/8	15.88	0.6250	65	115	48	16	R4585/8	R4575/8
	16.00	0.6299	65	115	48	16	R45816.0	R45716.0
41/64	16.27	0.6406	73	123	48	18	R45841/64	R45741/64
	16.50	0.6496	73	123	48	18	R45816.5	R45716.5
21/32	16.67	0.6563	73	123	48	18	R45821/32	R45721/32
	17.00	0.6693	73	123	48	18	R45817.0	R45717.0
43/64	17.07	0.6720	73	123	48	18	R45843/64	R45743/64
11/16	17.46	0.6874	73	123	48	18	R45811/16	R45711/16
	17.50	0.6890	73	123	48	18	R45817.5	R45717.5
	17.80	0.7008	73	123	48	18	R45817.8	
45/64	17.86	0.7031	73	123	48	18	R45845/64	R45745/64
	18.00	0.7087	73	123	48	18	R45818.0	R45718.0
23/32	18.26	0.7189	79	131	50	20	R45823/32	R45723/32
	18.50	0.7283	79	131	50	20	R45818.5	R45718.5
47/64	18.65	0.7343	79	131	50	20	R45847/64	R45747/64
	18.80	0.7402	79	131	50	20		R45718.8
	19.00	0.7480	79	131	50	20	R45819.0	R45719.0
	19.05	0.7500	79	131	50	20	R4583/4	
3/4	19.05	0.7500	79	131	50	20		R4573/4
	19.50	0.7677	79	131	50	20	R45819.5	R45719.5
	19.80	0.7795	79	131	50	20	R45819.8	R45719.8
	20.00	0.7874	79	131	50	20	R45820.0	R45720.0

R454 • Force X Drill 5xD

R453 • Force X Drill Oil Feed 5xD

R454	▪	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	3.1	3.2	3.3	3.4	6.1	6.2	6.3	7.1	7.2
		7.3	7.4																		
	•	2.4	4.1	4.2	4.3	6.4															
R453	▪	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	3.1	3.2	3.3	3.4	4.1	4.2	4.3	6.1	6.2	6.3
		6.4	7.1	7.2	7.3	7.4															
	•	2.3	2.4																		

R454	HM	DIN 6537 L	5XD	140°	TiAIN	DIN 6535HA	CTW			
R453	HM	DIN 6537 L	5XD	140°	TiAIN	DIN 6535HA	CTW			



d ₁ Ø Inch	d ₁ Ø _m , mm	d ₁ decimal Inch	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ Ø _h mm	R454	R453
	3.00	0.1181	28	66	36	6	R4543.0	R4533.0
	3.10	0.1220	28	66	36	6	R4543.1	R4533.1
1/8	3.18	0.1250	28	66	36	6	R4541/8	R4531/8
	3.20	0.1260	28	66	36	6	R4543.2	R4533.2
30	3.26	0.1283	28	66	36	6		R453N30
	3.30	0.1299	28	66	36	6	R4543.3	R4533.3
	3.40	0.1339	28	66	36	6	R4543.4	R4533.4
29	3.45	0.1360	28	66	36	6	R454N29	R453N29
	3.50	0.1378	28	66	36	6	R4543.5	R4533.5
28	3.57	0.1406	28	66	36	6	R454N28	R453N28
9/64	3.57	0.1406	28	66	36	6	R4549/64	R4539/64
	3.60	0.1417	28	66	36	6	R4543.6	R4533.6
27	3.66	0.1441	28	66	36	6	R454N27	R453N27
	3.70	0.1457	28	66	36	6	R4543.7	R4533.7
26	3.73	0.1469	36	74	36	6	R454N26	R453N26
25	3.80	0.1496	36	74	36	6	R4543.8	R4533.8
24	3.86	0.1520	36	74	36	6	R454N24	R453N24
	3.90	0.1535	36	74	36	6	R4543.9	R4533.9
23	3.91	0.1539	36	74	36	6	R454N23	R453N23
5/32	3.97	0.1563	36	74	36	6	R4545/32	R4535/32
22	3.99	0.1571	36	74	36	6	R454N22	R453N22
	4.00	0.1575	36	74	36	6	R4544.0	R4534.0
21	4.04	0.1591	36	74	36	6	R454N21	R453N21
	4.05	0.1594	36	74	36	6		R4534.05
20	4.09	0.1610	36	74	36	6	R454N20	R453N20
	4.10	0.1614	36	74	36	6	R4544.1	R4534.1

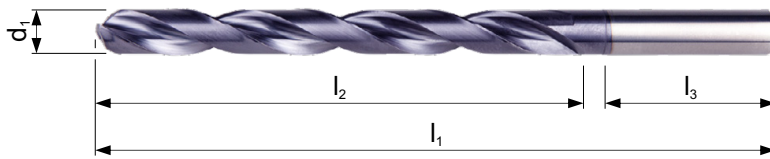
d_1 Ø Inch	d_1 Ø _m , mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Ø _h mm	R454	R453
	4.20	0.1654	36	74	36	6	R4544.2	R4534.2
19	4.22	0.1661	36	74	36	6	R454N19	R453N19
	4.30	0.1693	36	74	36	6	R4544.3	R4534.3
18	4.31	0.1697	36	74	36	6	R454N18	R453N18
11/64	4.37	0.1719	36	74	36	6	R45411/64	R45311/64
17	4.39	0.1728	36	74	36	6	R454N17	R453N17
	4.40	0.1732	36	74	36	6	R4544.4	R4534.4
	4.50	0.1772	36	74	36	6	R4544.5	R4534.5
16	4.50	0.1772	36	74	36	6	R454N16	R453N16
15	4.57	0.1799	36	74	36	6	R454N15	R453N15
	4.60	0.1811	36	74	36	6	R4544.6	R4534.6
14	4.62	0.1819	36	74	36	6	R454N14	R453N14
13	4.70	0.1850	36	74	36	6	R4544.7	R4534.7
3/16	4.76	0.1875	44	82	36	6	R4543/16	R4533/16
12	4.80	0.1890	44	82	36	6	R4544.8	R453N12
11	4.85	0.1909	44	82	36	6	R454N11	R453N11
	4.90	0.1929	44	82	36	6	R4544.9	R4534.9
10	4.92	0.1937	44	82	36	6	R454N10	R453N10
9	4.98	0.1961	44	82	36	6	R454N9	R453N9
	5.00	0.1969	44	82	36	6	R4545.0	R4535.0
	5.05	0.1988	44	82	36	6		R4535.05
8	5.06	0.1992	44	82	36	6	R454N8	R453N8
	5.10	0.2008	44	82	36	6	R4545.1	R4535.1
7	5.11	0.2010	44	82	36	6	R454N7	R453N7
13/64	5.16	0.2031	44	82	36	6	R45413/64	R45313/64
6	5.18	0.2039	44	82	36	6	R454N6	R453N6
	5.20	0.2047	44	82	36	6	R4545.2	R4535.2
5	5.22	0.2055	44	82	36	6	R454N5	R453N5
	5.30	0.2087	44	82	36	6		R4535.3
4	5.31	0.2091	44	82	36	6	R454N4	R453N4
	5.40	0.2126	44	82	36	6		R4535.4
3	5.41	0.2130	44	82	36	6	R454N3	R453N3
	5.50	0.2165	44	82	36	6	R4545.5	R4535.5
7/32	5.56	0.2188	44	82	36	6	R4547/32	R4537/32
	5.60	0.2205	44	82	36	6	R4545.6	R4535.6
2	5.61	0.2209	44	82	36	6	R454N2	R453N2
	5.70	0.2244	44	82	36	6	R4545.7	R4535.7
1	5.79	0.2280	44	82	36	6	R454N1	R453N1
	5.80	0.2283	44	82	36	6	R4545.8	R4535.8
	5.90	0.2323	44	82	36	6		R4535.9
A	5.94	0.2339	44	82	36	6	R454A	R453A
15/64	5.95	0.2344	44	82	36	6	R45415/64	R45315/64
	6.00	0.2362	44	82	36	6	R4546.0	R4536.0
B	6.05	0.2380	53	91	36	8	R454B	R453B
	6.05	0.2382	53	91	36	8		R4536.05
	6.10	0.2402	53	91	36	8	R4546.1	R4536.1
C	6.15	0.2421	53	91	36	8	R454C	R453C
	6.20	0.2441	53	91	36	8	R4546.2	R4536.2
D	6.25	0.2461	53	91	36	8	R454D	R453D
	6.30	0.2480	53	91	36	8	R4546.3	R4536.3
1/4	6.35	0.2500	53	91	36	8	R4541/4	R4531/4
E	6.35	0.2500	53	91	36	8	R454E	R453E
	6.40	0.2520	53	91	36	8	R4546.4	R4536.4
	6.50	0.2559	53	91	36	8	R4546.5	R4536.5
F	6.53	0.2571	53	91	36	8	R454F	R453F
	6.60	0.2598	53	91	36	8	R4546.6	R4536.6
G	6.63	0.2610	53	91	36	8	R454G	R453G
	6.70	0.2638	53	91	36	8	R4546.7	R4536.7
17/64	6.75	0.2656	53	91	36	8	R45417/64	R45317/64
H	6.76	0.2661	53	91	36	8		R453H
	6.80	0.2677	53	91	36	8	R4546.8	R4536.8
	6.90	0.2717	53	91	36	8	R4546.9	R4536.9
I	6.91	0.2720	53	91	36	8	R454I	R453I
	7.00	0.2756	53	91	36	8	R4547.0	R4537.0
J	7.04	0.2772	53	91	36	8	R454J	R453J
	7.10	0.2795	53	91	36	8	R4547.1	R4537.1
K	7.14	0.2811	53	91	36	8	R454K	R453K
9/32	7.14	0.2813	53	91	36	8	R4549/32	R4539/32
	7.20	0.2835	53	91	36	8		R4537.2
	7.30	0.2874	53	91	36	8	R4547.3	R4537.3

d_1 Ø Inch	d_1 Ø _{m7} mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Ø _{h6} mm	R454	R453
L	7.37	0.2902	53	91	36	8	R454L	
	7.40	0.2913	53	91	36	8	R4547.4	R4537.4
M	7.49	0.2949	53	91	36	8	R454M	R453M
	7.50	0.2953	53	91	36	8	R4547.5	R4537.5
19/64	7.54	0.2969	53	91	36	8	R45419/64	R45319/64
	7.60	0.2992	53	91	36	8	R4547.6	R4537.6
N	7.67	0.3020	53	91	36	8	R454N	R453N
	7.70	0.3031	53	91	36	8	R4547.7	R4537.7
	7.80	0.3071	53	91	36	8	R4547.8	R4537.8
	7.90	0.3110	53	91	36	8	R4547.9	R4537.9
5/16	7.94	0.3125	53	91	36	8	R4545/16	R4535/16
	8.00	0.3150	53	91	36	8	R4548.0	R4538.0
O	8.03	0.3161	61	103	40	10	R454O	R453O
	8.05	0.3169	61	103	40	10		R4538.05
	8.10	0.3189	61	103	40	10	R4548.1	R4538.1
	8.20	0.3228	61	103	40	10	R4548.2	R4538.2
P	8.20	0.3228	61	103	40	10	R454P	R453P
	8.30	0.3268	61	103	40	10		R4538.3
21/64	8.33	0.3281	61	103	40	10	R45421/64	R45321/64
	8.40	0.3307	61	103	40	10	R4548.4	R4538.4
Q	8.43	0.3319	61	103	40	10		R453Q
	8.50	0.3346	61	103	40	10	R4548.5	R4538.5
	8.60	0.3386	61	103	40	10	R4548.6	R4538.6
R	8.61	0.3390	61	103	40	10	R454R	R453R
	8.70	0.3425	61	103	40	10	R4548.7	R4538.7
11/32	8.73	0.3438	61	103	40	10	R45411/32	R45311/32
	8.80	0.3465	61	103	40	10	R4548.8	R4538.8
S	8.84	0.3480	61	103	40	10	R454S	R453S
	8.90	0.3504	61	103	40	10	R4548.9	R4538.9
	9.00	0.3543	61	103	40	10	R4549.0	R4539.0
T	9.09	0.3579	61	103	40	10	R454T	R453T
	9.10	0.3583	61	103	40	10	R4549.1	R4539.1
23/64	9.13	0.3594	61	103	40	10	R45423/64	R45323/64
	9.20	0.3622	61	103	40	10		R4539.2
	9.30	0.3661	61	103	40	10	R4549.3	R4539.3
U	9.35	0.3681	61	103	40	10	R454U	R453U
	9.40	0.3701	61	103	40	10	R4549.4	R4539.4
	9.50	0.3740	61	103	40	10	R4549.5	R4539.5
3/8	9.53	0.3750	61	103	40	10	R4543/8	R4533/8
V	9.58	0.3772	61	103	40	10	R454V	R453V
	9.60	0.3780	61	103	40	10	R4549.6	R4539.6
	9.70	0.3819	61	103	40	10	R4549.7	R4539.7
	9.80	0.3858	61	103	40	10	R4549.8	R4539.8
W	9.80	0.3858	61	103	40	10	R454W	R453W
	9.90	0.3898	61	103	40	10	R4549.9	R4539.9
25/64	9.92	0.3906	61	103	40	10	R45425/64	R45325/64
	10.00	0.3937	61	103	40	10	R45410.0	R45310.0
	10.05	0.3957	70	118	45	12		R45310.05
X	10.08	0.3969	70	118	45	12	R454X	R453X
	10.10	0.3976	70	118	45	12	R45410.1	R45310.1
	10.20	0.4016	70	118	45	12	R45410.2	R45310.2
Y	10.26	0.4039	70	118	45	12	R454Y	R453Y
	10.30	0.4055	70	118	45	12	R45410.3	R45310.3
13/32	10.32	0.4063	70	118	45	12	R45413/32	R45313/32
	10.40	0.4094	70	118	45	12	R45410.4	R45310.4
Z	10.49	0.4130	70	118	45	12	R454Z	R453Z
	10.50	0.4134	70	118	45	12	R45410.5	R45310.5
	10.60	0.4173	70	118	45	12	R45410.6	R45310.6
27/64	10.72	0.4219	70	118	45	12	R45427/64	R45327/64
	10.80	0.4252	70	118	45	12		R45310.8
	11.00	0.4331	70	118	45	12	R45411.0	R45311.0
7/16	11.11	0.4375	70	118	45	12	R4547/16	R4537/16
	11.20	0.4409	70	118	45	12	R45411.2	R45311.2
	11.30	0.4449	70	118	45	12		R45311.3
	11.40	0.4488	70	118	45	12	R45411.4	R45311.4
	11.50	0.4528	70	118	45	12	R45411.5	R45311.5
29/64	11.51	0.4531	70	118	45	12	R45429/64	R45329/64
	11.60	0.4567	70	118	45	12	R45411.6	R45311.6
	11.80	0.4646	70	118	45	12	R45411.8	R45311.8
15/32	11.91	0.4688	70	118	45	12	R45415/32	R45315/32

d_1 \varnothing Inch	d_1 \varnothing mm, mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 \varnothing h ₆ mm	R454	R453
	12.00	0.4724	70	118	45	12	R45412.0	R45312.0
	12.05	0.4744	76	124	45	14		R45312.05
	12.10	0.4764	76	124	45	14	R45412.1	
	12.20	0.4803	76	124	45	14	R45412.2	R45312.2
31/64	12.30	0.4844	76	124	45	14	R45431/64	R45331/64
	12.50	0.4921	76	124	45	14	R45412.5	R45312.5
	12.70	0.5000	76	124	45	14	R45412.7	R45312.7
1/2	12.70	0.5000	76	124	45	14	R4541/2	R4531/2
	12.80	0.5039	76	124	45	14	R45412.8	R45312.8
	13.00	0.5118	76	124	45	14	R45413.0	R45313.0
33/64	13.10	0.5156	76	124	45	14	R45433/64	R45333/64
	13.30	0.5236	76	124	45	14		R45313.3
17/32	13.49	0.5313	76	124	45	14	R45417/32	R45317/32
	13.50	0.5315	76	124	45	14	R45413.5	R45313.5
	13.80	0.5433	76	124	45	14	R45413.8	R45313.8
35/64	13.89	0.5469	76	124	45	14	R45435/64	R45335/64
	14.00	0.5512	76	124	45	14	R45414.0	R45314.0
	14.25	0.5610	82	133	48	16	R45414.25	R45314.25
9/16	14.29	0.5625	82	133	48	16	R4549/16	R4539/16
	14.50	0.5709	82	133	48	16	R45414.5	R45314.5
37/64	14.68	0.5781	82	133	48	16	R45437/64	R45337/64
	14.80	0.5827	82	133	48	16	R45414.8	R45314.8
	15.00	0.5906	82	133	48	16	R45415.0	R45315.0
19/32	15.08	0.5938	82	133	48	16	R45419/32	R45319/32
	15.10	0.5945	82	133	48	16	R45415.1	R45315.1
	15.30	0.6024	82	133	48	16		R45315.3
39/64	15.48	0.6094	82	133	48	16	R45439/64	R45339/64
	15.50	0.6102	82	133	48	16	R45415.5	R45315.5
	15.80	0.6220	82	133	48	16	R45415.8	R45315.8
5/8	15.88	0.6250	82	133	48	16	R4545/8	R4535/8
	16.00	0.6299	82	133	48	16	R45416.0	R45316.0
41/64	16.27	0.6406	91	143	48	18	R45441/64	R45341/64
	16.50	0.6496	91	143	48	18	R45416.5	R45316.5
21/32	16.67	0.6563	91	143	48	18	R45421/32	R45321/32
	17.00	0.6693	91	143	48	18	R45417.0	R45317.0
43/64	17.07	0.6720	91	143	48	18	R45443/64	R45343/64
11/16	17.46	0.6874	91	143	48	18	R45411/16	R45311/16
	17.50	0.6890	91	143	48	18	R45417.5	R45317.5
	17.80	0.7008	91	143	48	18	R45417.8	R45317.8
45/64	17.86	0.7031	91	143	48	18	R45445/64	R45345/64
	18.00	0.7087	91	143	48	18	R45418.0	R45318.0
23/32	18.26	0.7189	99	143	48	20		R45323/32
23/32	18.26	0.7189	99	153	50	20	R45423/32	
	18.50	0.7283	99	153	50	20	R45418.5	R45318.5
47/64	18.65	0.7343	99	153	50	20	R45447/64	R45347/64
	19.00	0.7480	99	153	50	20	R45419.0	R45319.0
3/4	19.05	0.7500	99	153	50	20	R4543/4	R4533/4
	19.50	0.7677	99	153	50	20	R45419.5	R45319.5
	19.80	0.7795	99	153	50	20	R45419.8	R45319.8
	20.00	0.7874	99	153	50	20	R45420.0	R45320.0

R459 • Force X Drill Oil Feed 8×D

- R459 ■ 1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 3.1 3.2 3.3 3.4 7.2 7.3 7.4
 • 2.3 6.1 6.2 6.3 6.4 7.1



d_1 $\varnothing m_7$ Inch	d_1 $\varnothing m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\varnothing h_6$ mm	R459
	3.00	0.1181	37	79	36	6	R4593.0
	3.10	0.1220	37	79	36	6	R4593.1
1/8	3.18	0.1250	37	79	36	6	R4591/8
	3.20	0.1260	37	79	36	6	R4593.2
	3.30	0.1299	37	79	36	6	R4593.3
	3.40	0.1339	37	79	36	6	R4593.4
	3.50	0.1378	37	79	36	6	R4593.5
9/64	3.57	0.1406	37	79	36	6	R4599/64
	3.60	0.1417	37	79	36	6	R4593.6
	3.70	0.1457	37	79	36	6	R4593.7
	3.80	0.1496	48	90	36	6	R4593.8
	3.90	0.1535	48	90	36	6	R4593.9
5/32	3.97	0.1563	48	90	36	6	R4595/32
	4.00	0.1575	48	90	36	6	R4594.0
	4.10	0.1614	48	90	36	6	R4594.1
	4.20	0.1654	48	90	36	6	R4594.2
	4.30	0.1693	48	90	36	6	R4594.3
11/64	4.37	0.1719	48	90	36	6	R45911/64
	4.40	0.1732	48	90	36	6	R4594.4
	4.50	0.1772	48	90	36	6	R4594.5
	4.60	0.1811	48	90	36	6	R4594.6
3/16	4.70	0.1850	62	104	36	6	R4594.7
	4.76	0.1875	62	104	36	6	R4593/16
	4.80	0.1890	62	104	36	6	R4594.8
	4.90	0.1929	62	104	36	6	R4594.9
	5.00	0.1969	62	104	36	6	R4595.0
	5.10	0.2008	62	104	36	6	R4595.1
13/64	5.16	0.2031	62	104	36	6	R45913/64
	5.20	0.2047	62	104	36	6	R4595.2
	5.30	0.2087	62	104	36	6	R4595.3
	5.40	0.2126	62	104	36	6	R4595.4
	5.50	0.2165	62	104	36	6	R4595.5
7/32	5.56	0.2188	62	104	36	6	R4597/32
	5.60	0.2205	62	104	36	6	R4595.6
	5.70	0.2244	62	104	36	6	R4595.7
	5.80	0.2283	62	104	36	6	R4595.8
	5.90	0.2323	62	104	36	6	R4595.9
15/64	5.95	0.2344	62	104	36	6	R45915/64
	6.00	0.2362	62	104	36	6	R4596.0
	6.10	0.2402	84	126	36	8	R4596.1

d_1 $\varnothing m_7$ Inch	d_1 $\varnothing m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\varnothing h_6$ mm	R459
1/4	6.20	0.2441	84	126	36	8	R4596.2
	6.30	0.2480	84	126	36	8	R4596.3
	6.35	0.2500	84	126	36	8	R4591/4
	6.40	0.2520	84	126	36	8	R4596.4
	6.50	0.2559	84	126	36	8	R4596.5
17/64	6.60	0.2598	84	126	36	8	R4596.6
	6.70	0.2638	84	126	36	8	R4596.7
	6.75	0.2656	84	126	36	8	R45917/64
	6.80	0.2677	84	126	36	8	R4596.8
	6.90	0.2717	84	126	36	8	R4596.9
9/32	7.00	0.2756	84	126	36	8	R4597.0
	7.10	0.2795	84	126	36	8	R4597.1
	7.14	0.2813	84	126	36	8	R4599/32
	7.20	0.2835	84	126	36	8	R4597.2
	7.30	0.2874	84	126	36	8	R4597.3
19/64	7.40	0.2913	84	126	36	8	R4597.4
	7.50	0.2953	84	126	36	8	R4597.5
	7.54	0.2969	84	126	36	8	R45919/64
	7.60	0.2992	84	126	36	8	R4597.6
	7.70	0.3031	84	126	36	8	R4597.7
5/16	7.80	0.3071	84	126	36	8	R4597.8
	7.90	0.3110	84	126	36	8	R4597.9
	7.94	0.3125	84	126	36	8	R4595/16
	8.00	0.3150	84	126	36	8	R4598.0
	8.10	0.3189	106	152	40	10	R4598.1
21/64	8.20	0.3228	106	152	40	10	R4598.2
	8.30	0.3268	106	152	40	10	R4598.3
	8.33	0.3281	106	152	40	10	R45921/64
	8.40	0.3307	106	152	40	10	R4598.4
	8.50	0.3346	106	152	40	10	R4598.5
11/32	8.60	0.3386	106	152	40	10	R4598.6
	8.70	0.3425	106	152	40	10	R4598.7
	8.73	0.3438	106	152	40	10	R45911/32
	8.80	0.3465	106	152	40	10	R4598.8
	8.90	0.3504	106	152	40	10	R4598.9
23/64	9.00	0.3543	106	152	40	10	R4599.0
	9.10	0.3583	106	152	40	10	R4599.1
	9.13	0.3594	106	152	40	10	R45923/64
	9.20	0.3622	106	152	40	10	R4599.2
	9.30	0.3661	106	152	40	10	R4599.3
3/8	9.40	0.3701	106	152	40	10	R4599.4
	9.50	0.3740	106	152	40	10	R4599.5
	9.53	0.3750	106	152	40	10	R4593/8
	9.60	0.3780	106	152	40	10	R4599.6
	9.70	0.3819	106	152	40	10	R4599.7
25/64	9.80	0.3858	106	152	40	10	R4599.8
	9.90	0.3898	106	152	40	10	R4599.9
	9.92	0.3906	106	152	40	10	R45925/64
	10.00	0.3937	106	152	40	10	R45910.0
	10.20	0.4016	128	180	45	12	R45910.2
13/32	10.30	0.4055	128	180	45	12	R45910.3
	10.32	0.4063	128	180	45	12	R45913/32
	10.40	0.4094	128	180	45	12	R45910.4
27/64	10.50	0.4134	128	180	45	12	R45910.5
	10.72	0.4219	128	180	45	12	R45927/64
	10.80	0.4252	128	180	45	12	R45910.8
7/16	11.00	0.4331	128	180	45	12	R45911.0
	11.11	0.4375	128	180	45	12	R4597/16
	11.20	0.4409	128	180	45	12	R45911.2
29/64	11.30	0.4449	128	180	45	12	R45911.3
	11.50	0.4528	128	180	45	12	R45911.5
	11.51	0.4531	128	180	45	12	R45929/64
15/32	11.80	0.4646	128	180	45	12	R45911.8
	11.91	0.4688	128	180	45	12	R45915/32
31/64	12.00	0.4724	128	180	45	12	R45912.0
	12.20	0.4803	151	202	48	14	R45912.2
	12.30	0.4844	151	202	48	14	R45931/64
1/2	12.50	0.4921	151	202	48	14	R45912.5
	12.70	0.5000	151	202	48	14	R4591/2
	12.80	0.5039	151	202	48	14	R45912.8
	13.00	0.5118	151	202	48	14	R45913.0

d_1 $\varnothing m,$ Inch	d_1 $\varnothing m,$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\varnothing h_6$ mm	R459
33/64	13.10	0.5156	151	202	48	14	R45933/64
17/32	13.49	0.5313	151	202	48	14	R45917/32
	13.50	0.5315	151	202	48	14	R45913.5
35/64	13.89	0.5469	151	202	48	14	R45935/64
	14.00	0.5512	151	202	48	14	R45914.0
	14.25	0.5610	172	227	48	16	R45914.25
9/16	14.29	0.5625	172	227	48	16	R4599/16
	14.50	0.5709	172	227	48	16	R45914.5
37/64	14.68	0.5781	172	227	48	16	R45937/64
	15.00	0.5906	172	227	48	16	R45915.0
19/32	15.08	0.5938	172	227	48	16	R45919/32
	15.10	0.5945	172	227	48	16	R45915.1
39/64	15.48	0.6094	172	227	48	16	R45939/64
	15.50	0.6102	172	227	48	16	R45915.5
5/8	15.88	0.6250	172	227	48	16	R4595/8
	16.00	0.6299	172	227	48	16	R45916.0

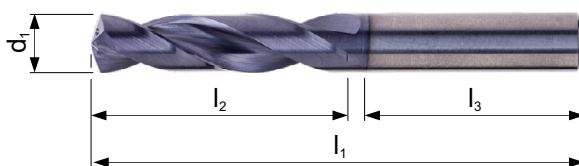
FORCE X



R467 • Force M Drill Oil Feed 3×D

- R467 ■ 2.1 2.2 2.3 2.4 4.1 4.2 4.3
 • 5.1 5.2 5.3

R467 **HM** **DIN 6537 K** **3XD** **140°** **TiAIN** **DIN 6535HA** **CTW**



d_1 \varnothing "/Nr./letter	d_1 \varnothing_{m_7} mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 \varnothing_{h_6} mm	R467
	3.00	0.1181	20	62	36	6	R4673.0
	3.10	0.1220	20	62	36	6	R4673.1
1/8	3.18	0.1250	20	62	36	6	R4671/8
	3.20	0.1260	20	62	36	6	R4673.2
	3.30	0.1299	20	62	36	6	R4673.3
	3.40	0.1339	20	62	36	6	R4673.4
29	3.45	0.1360	20	62	36	6	R467N29
	3.50	0.1378	20	62	36	6	R4673.5
9/64	3.57	0.1406	20	62	36	6	R4679/64
	3.60	0.1417	20	62	36	6	R4673.6
	3.70	0.1457	20	62	36	6	R4673.7
	3.80	0.1496	24	66	36	6	R4673.8
	3.90	0.1535	24	66	36	6	R4673.9
5/32	3.97	0.1563	24	66	36	6	R4675/32
	4.00	0.1575	24	66	36	6	R4674.0
	4.05	0.1594	24	66	36	6	R4674.05
	4.10	0.1614	24	66	36	6	R4674.1
	4.20	0.1654	24	66	36	6	R4674.2
11/64	4.30	0.1693	24	66	36	6	R4674.3
	4.37	0.1719	24	66	36	6	R46711/64
	4.40	0.1732	24	66	36	6	R4674.4
	4.50	0.1772	24	66	36	6	R4674.5
	4.60	0.1811	24	66	36	6	R4674.6
3/16	4.70	0.1850	24	66	36	6	R4674.7
	4.76	0.1875	28	66	36	6	R4673/16
	4.80	0.1890	28	66	36	6	R4674.8
	4.90	0.1929	28	66	36	6	R4674.9
	5.00	0.1969	28	66	36	6	R4675.0
	5.05	0.1988	28	66	36	6	R4675.05
	5.10	0.2008	28	66	36	6	R4675.1
7	5.11	0.2010	28	66	36	6	R467N7
13/64	5.16	0.2031	28	66	36	6	R46713/64
	5.20	0.2047	28	66	36	6	R4675.2
5	5.22	0.2055	28	66	36	6	R467N5
	5.30	0.2087	28	66	36	6	R4675.3
	5.40	0.2126	28	66	36	6	R4675.4
	5.50	0.2165	28	66	36	6	R4675.5
7/32	5.56	0.2188	28	66	36	6	R4677/32
	5.60	0.2205	28	66	36	6	R4675.6
	5.70	0.2244	28	66	36	6	R4675.7

d_1 \emptyset "/Nr./letter	d_1 $\emptyset m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	R467
	5.80	0.2283	28	66	36	6	R4675.8
	5.90	0.2323	28	66	36	6	R4675.9
15/64	5.95	0.2344	28	66	36	6	R46715/64
	6.00	0.2362	28	66	36	6	R4676.0
	6.05	0.2382	34	79	36	8	R4676.05
	6.10	0.2402	34	79	36	8	R4676.1
	6.20	0.2441	34	79	36	8	R4676.2
	6.30	0.2480	34	79	36	8	R4676.3
1/4	6.35	0.2500	34	79	36	8	R4671/4
	6.40	0.2520	34	79	36	8	R4676.4
	6.50	0.2559	34	79	36	8	R4676.5
	6.60	0.2598	34	79	36	8	R4676.6
	6.70	0.2638	34	79	36	8	R4676.7
17/64	6.75	0.2656	34	79	36	8	R46717/64
	6.80	0.2677	34	79	36	8	R4676.8
	6.90	0.2717	34	79	36	8	R4676.9
	7.00	0.2756	34	79	36	8	R4677.0
	7.10	0.2795	41	79	36	8	R4677.1
9/32	7.14	0.2813	41	79	36	8	R4679/32
	7.20	0.2835	41	79	36	8	R4677.2
	7.30	0.2874	41	79	36	8	R4677.3
	7.40	0.2913	41	79	36	8	R4677.4
	7.50	0.2953	41	79	36	8	R4677.5
19/64	7.54	0.2969	41	79	36	8	R46719/64
	7.60	0.2992	41	79	36	8	R4677.6
	7.70	0.3031	41	79	36	8	R4677.7
	7.80	0.3071	41	79	36	8	R4677.8
	7.90	0.3110	41	79	36	8	R4677.9
5/16	7.94	0.3125	41	79	36	8	R4675/16
	8.00	0.3150	41	79	36	8	R4678.0
	8.05	0.3169	47	89	40	10	R4678.05
	8.10	0.3189	47	89	40	10	R4678.1
	8.20	0.3228	47	89	40	10	R4678.2
	8.30	0.3268	47	89	40	10	R4678.3
21/64	8.33	0.3281	47	89	40	10	R46721/64
	8.40	0.3307	47	89	40	10	R4678.4
	8.50	0.3346	47	89	40	10	R4678.5
	8.60	0.3386	47	89	40	10	R4678.6
	8.70	0.3425	47	89	40	10	R4678.7
11/32	8.73	0.3438	47	89	40	10	R46711/32
	8.80	0.3465	47	89	40	10	R4678.8
	8.90	0.3504	47	89	40	10	R4678.9
	9.00	0.3543	47	89	40	10	R4679.0
	9.10	0.3583	47	89	40	10	R4679.1
23/64	9.13	0.3594	47	89	40	10	R46723/64
	9.20	0.3622	47	89	40	10	R4679.2
	9.30	0.3661	47	89	40	10	R4679.3
	9.40	0.3701	47	89	40	10	R4679.4
	9.50	0.3740	47	89	40	10	R4679.5
3/8	9.53	0.3750	47	89	40	10	R4673/8
	9.60	0.3780	47	89	40	10	R4679.6
	9.70	0.3819	47	89	40	10	R4679.7
	9.80	0.3858	47	89	40	10	R4679.8
	9.90	0.3898	47	89	40	10	R4679.9
25/64	9.92	0.3906	47	89	40	10	R46725/64
	10.00	0.3937	47	89	40	10	R46710.0
	10.05	0.3957	55	102	45	12	R46710.05
	10.10	0.3976	55	102	45	12	R46710.1
	10.20	0.4016	55	102	45	12	R46710.2
	10.30	0.4055	55	102	45	12	R46710.3
13/32	10.32	0.4063	55	102	45	12	R46713/32
	10.40	0.4094	55	102	45	12	R46710.4
	10.50	0.4134	55	102	45	12	R46710.5
	10.60	0.4173	55	102	45	12	R46710.6
27/64	10.72	0.4219	55	102	45	12	R46727/64
	10.80	0.4252	55	102	45	12	R46710.8
	10.90	0.4291	55	102	45	12	R46710.9
	11.00	0.4331	55	102	45	12	R46711.0
7/16	11.11	0.4375	55	102	45	12	R4677/16
	11.20	0.4409	55	102	45	12	R46711.2
	11.30	0.4449	55	102	45	12	R46711.3

d_1 \emptyset "/Nr./letter	d_1 $\emptyset m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	R467
	11.40	0.4488	55	102	45	12	R46711.4
	11.50	0.4528	55	102	45	12	R46711.5
29/64	11.51	0.4531	55	102	45	12	R46729/64
	11.60	0.4567	55	102	45	12	R46711.6
	11.80	0.4646	55	102	45	12	R46711.8
15/32	11.91	0.4688	55	102	45	12	R46715/32
	12.00	0.4724	55	102	45	12	R46712.0
	12.05	0.4744	60	107	45	14	R46712.05
	12.10	0.4764	60	107	45	14	R46712.1
	12.20	0.4803	60	107	45	14	R46712.2
31/64	12.30	0.4844	60	107	45	14	R46731/64
	12.50	0.4921	60	107	45	14	R46712.5
	12.70	0.5000	60	107	45	14	R46712.7
1/2	12.70	0.5000	60	107	45	14	R4671/2
	12.80	0.5039	60	107	45	14	R46712.8
	13.00	0.5118	60	107	45	14	R46713.0
33/64	13.10	0.5156	60	107	45	14	R46733/64
	13.30	0.5236	60	107	45	14	R46713.3
17/32	13.49	0.5313	60	107	45	14	R46717/32
	13.50	0.5315	60	107	45	14	R46713.5
	13.80	0.5433	60	107	45	14	R46713.8
35/64	13.89	0.5469	60	107	45	14	R46735/64
	14.00	0.5512	60	107	45	14	R46714.0
	14.25	0.5610	65	115	48	16	R46714.25
9/16	14.29	0.5625	65	115	48	16	R4679/16
	14.50	0.5709	65	115	48	16	R46714.5
37/64	14.68	0.5781	65	115	48	16	R46737/64
	14.80	0.5827	65	115	48	16	R46714.8
	15.00	0.5906	65	115	48	16	R46715.0
19/32	15.08	0.5938	65	115	48	16	R46719/32
	15.10	0.5945	65	115	48	16	R46715.1
	15.30	0.6024	65	115	48	16	R46715.3
39/64	15.48	0.6094	65	115	48	16	R46739/64
	15.50	0.6102	65	115	48	16	R46715.5
	15.80	0.6220	65	115	48	16	R46715.8
5/8	15.88	0.6250	65	115	48	16	R4675/8
	16.00	0.6299	65	115	48	16	R46716.0

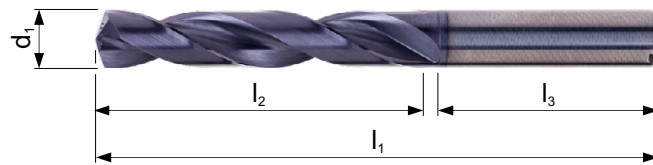
FORCE M



R463 • Force M Drill Oil Feed 5×D

- R463 ■ 2.1 2.2 2.3 2.4 4.1 4.2 4.3
 • 5.1 5.2 5.3

R463 **HM** **DIN 6537 L** **5XD** **140°** **TiAlN** **DIN 6535HA** **CTW**



d_1 \varnothing "/Nr./letter	d_1 \varnothing_{m_7} mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 \varnothing_{h_6} mm	R463
	3.00	0.1181	28	66	36	6	R4633.0
	3.10	0.1220	28	66	36	6	R4633.1
1/8	3.18	0.1250	28	66	36	6	R4631/8
	3.20	0.1260	28	66	36	6	R4633.2
	3.30	0.1299	28	66	36	6	R4633.3
	3.40	0.1339	28	66	36	6	R4633.4
29	3.45	0.1360	28	66	36	6	R463N29
	3.50	0.1378	28	66	36	6	R4633.5
9/64	3.57	0.1406	28	66	36	6	R4639/64
	3.60	0.1417	28	66	36	6	R4633.6
	3.70	0.1457	28	66	36	6	R4633.7
	3.80	0.1496	36	74	36	6	R4633.8
	3.90	0.1535	36	74	36	6	R4633.9
5/32	3.97	0.1563	36	74	36	6	R4635/32
	4.00	0.1575	36	74	36	6	R4634.0
	4.05	0.1594	36	74	36	6	R4634.05
	4.10	0.1614	36	74	36	6	R4634.1
	4.20	0.1654	36	74	36	6	R4634.2
	4.30	0.1693	36	74	36	6	R4634.3
11/64	4.37	0.1719	36	74	36	6	R46311/64
	4.40	0.1732	36	74	36	6	R4634.4
	4.50	0.1772	36	74	36	6	R4634.5
	4.60	0.1811	36	74	36	6	R4634.6
	4.70	0.1850	36	74	36	6	R4634.7
3/16	4.76	0.1875	44	82	36	6	R4633/16
	4.80	0.1890	44	82	36	6	R4634.8
	4.90	0.1929	44	82	36	6	R4634.9
	5.00	0.1969	44	82	36	6	R4635.0
	5.05	0.1988	44	82	36	6	R4635.05
	5.10	0.2008	44	82	36	6	R4635.1
7	5.11	0.2010	44	82	36	6	R463N7
13/64	5.16	0.2031	44	82	36	6	R46313/64
	5.20	0.2047	44	82	36	6	R4635.2
5	5.22	0.2055	44	82	36	6	R463N5
	5.30	0.2087	44	82	36	6	R4635.3
	5.40	0.2126	44	82	36	6	R4635.4
	5.50	0.2165	44	82	36	6	R4635.5
7/32	5.56	0.2188	44	82	36	6	R4637/32
	5.60	0.2205	44	82	36	6	R4635.6
	5.70	0.2244	44	82	36	6	R4635.7

d_1 \emptyset "/Nr./letter	d_1 $\emptyset m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	R463
	5.80	0.2283	44	82	36	6	R4635.8
	5.90	0.2323	44	82	36	6	R4635.9
15/64	5.95	0.2344	44	82	36	6	R46315/64
	6.00	0.2362	44	82	36	6	R4636.0
	6.05	0.2382	53	91	36	8	R4636.05
	6.10	0.2402	53	91	36	8	R4636.1
	6.20	0.2441	53	91	36	8	R4636.2
	6.30	0.2480	53	91	36	8	R4636.3
1/4	6.35	0.2500	53	91	36	8	R4631/4
	6.40	0.2520	53	91	36	8	R4636.4
	6.50	0.2559	53	91	36	8	R4636.5
	6.60	0.2598	53	91	36	8	R4636.6
	6.70	0.2638	53	91	36	8	R4636.7
17/64	6.75	0.2656	53	91	36	8	R46317/64
	6.80	0.2677	53	91	36	8	R4636.8
	6.90	0.2717	53	91	36	8	R4636.9
	7.00	0.2756	53	91	36	8	R4637.0
	7.10	0.2795	53	91	36	8	R4637.1
9/32	7.14	0.2813	53	91	36	8	R4639/32
	7.20	0.2835	53	91	36	8	R4637.2
	7.30	0.2874	53	91	36	8	R4637.3
	7.40	0.2913	53	91	36	8	R4637.4
	7.50	0.2953	53	91	36	8	R4637.5
19/64	7.54	0.2969	53	91	36	8	R46319/64
	7.60	0.2992	53	91	36	8	R4637.6
	7.70	0.3031	53	91	36	8	R4637.7
	7.80	0.3071	53	91	36	8	R4637.8
	7.90	0.3110	53	91	36	8	R4637.9
5/16	7.94	0.3125	53	91	36	8	R4635/16
	8.00	0.3150	53	91	36	8	R4638.0
	8.05	0.3169	61	103	40	10	R4638.05
	8.10	0.3189	61	103	40	10	R4638.1
	8.20	0.3228	61	103	40	10	R4638.2
	8.30	0.3268	61	103	40	10	R4638.3
21/64	8.33	0.3281	61	103	40	10	R46321/64
	8.40	0.3307	61	103	40	10	R4638.4
	8.50	0.3346	61	103	40	10	R4638.5
	8.60	0.3386	61	103	40	10	R4638.6
	8.70	0.3425	61	103	40	10	R4638.7
11/32	8.73	0.3438	61	103	40	10	R46311/32
	8.80	0.3465	61	103	40	10	R4638.8
	8.90	0.3504	61	103	40	10	R4638.9
	9.00	0.3543	61	103	40	10	R4639.0
	9.10	0.3583	61	103	40	10	R4639.1
23/64	9.13	0.3594	61	103	40	10	R46323/64
	9.20	0.3622	61	103	40	10	R4639.2
	9.30	0.3661	61	103	40	10	R4639.3
	9.40	0.3701	61	103	40	10	R4639.4
	9.50	0.3740	61	103	40	10	R4639.5
3/8	9.53	0.3750	61	103	40	10	R4633/8
	9.60	0.3780	61	103	40	10	R4639.6
	9.70	0.3819	61	103	40	10	R4639.7
	9.80	0.3858	61	103	40	10	R4639.8
	9.90	0.3898	61	103	40	10	R4639.9
25/64	9.92	0.3906	61	103	40	10	R46325/64
	10.00	0.3937	61	103	40	10	R46310.0
	10.05	0.3957	70	118	45	12	R46310.05
	10.10	0.3976	70	118	45	12	R46310.1
	10.20	0.4016	70	118	45	12	R46310.2
	10.30	0.4055	70	118	45	12	R46310.3
13/32	10.32	0.4063	70	118	45	12	R46313/32
	10.40	0.4094	70	118	45	12	R46310.4
	10.50	0.4134	70	118	45	12	R46310.5
	10.60	0.4173	70	118	45	12	R46310.6
27/64	10.72	0.4219	70	118	45	12	R46327/64
	10.80	0.4252	70	118	45	12	R46310.8
	10.90	0.4291	70	118	45	12	R46310.9
	11.00	0.4331	70	118	45	12	R46311.0
7/16	11.11	0.4375	70	118	45	12	R4637/16
	11.20	0.4409	70	118	45	12	R46311.2
	11.30	0.4449	70	118	45	12	R46311.3

d_1 \emptyset "/Nr./letter	d_1 $\emptyset m_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	R463
	11.40	0.4488	70	118	45	12	R46311.4
	11.50	0.4528	70	118	45	12	R46311.5
29/64	11.51	0.4531	70	118	45	12	R46329/64
	11.60	0.4567	70	118	45	12	R46311.6
	11.80	0.4646	70	118	45	12	R46311.8
15/32	11.91	0.4688	70	118	45	12	R46315/32
	12.00	0.4724	70	118	45	12	R46312.0
	12.05	0.4744	76	124	45	14	R46312.05
	12.20	0.4803	76	124	45	14	R46312.2
31/64	12.30	0.4844	76	124	45	14	R46331/64
	12.50	0.4921	76	124	45	14	R46312.5
	12.70	0.5000	76	124	45	14	R46312.7
1/2	12.70	0.5000	76	124	45	14	R4631/2
	12.80	0.5039	76	124	45	14	R46312.8
	13.00	0.5118	76	124	45	14	R46313.0
33/64	13.10	0.5156	76	124	45	14	R46333/64
	13.30	0.5236	76	124	45	14	R46313.3
17/32	13.49	0.5313	76	124	45	14	R46317/32
	13.50	0.5315	76	124	45	14	R46313.5
	13.80	0.5433	76	124	45	14	R46313.8
35/64	13.89	0.5469	76	124	45	14	R46335/64
	14.00	0.5512	76	124	45	14	R46314.0
	14.25	0.5610	82	133	48	16	R46314.25
9/16	14.29	0.5625	82	133	48	16	R4639/16
	14.50	0.5709	82	133	48	16	R46314.5
37/64	14.68	0.5781	82	133	48	16	R46337/64
	14.80	0.5827	82	133	48	16	R46314.8
	15.00	0.5906	82	133	48	16	R46315.0
19/32	15.08	0.5938	82	133	48	16	R46319/32
	15.10	0.5945	82	133	48	16	R46315.1
	15.30	0.6024	82	133	48	16	R46315.3
39/64	15.48	0.6094	82	133	48	16	R46339/64
	15.50	0.6102	82	133	48	16	R46315.5
	15.80	0.6220	82	133	48	16	R46315.8
5/8	15.88	0.6250	82	133	48	16	R4635/8
	16.00	0.6299	82	133	48	16	R46316.0

SIMPLY RELIABLE

As a professional you can judge the quality of work by just looking at the chip. Our chip is a clean and uncomplicated shape that in itself tells a story. It is a clear and consistent signal and that's why we use it as a symbol for being **Simply Reliable**.

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