

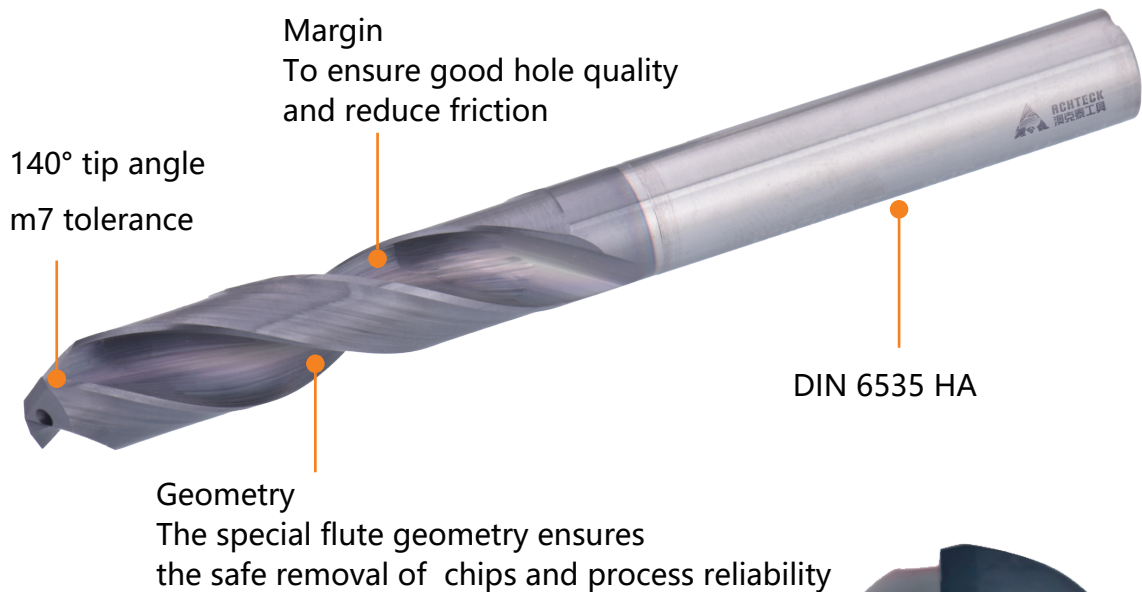
NEW
PRODUCT!

D151--Solid Carbide Drill

For stainless steel
and difficult machining material

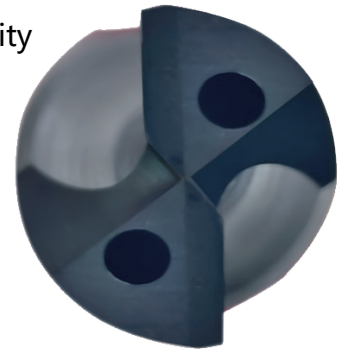


◆ D151 Solid Carbide drill



Application

- Main application for ISO material M,S. 2nd choice for P,K,N,
- Emulsion or cutting oil can be used.
- Can be applied in general machining, aerospace, medical equipment, food and chemical industry, small parts industry.



Features

- Linear cutting edge with special geometry can reduce the cutting force and improve tool stability.
- Double relief angle to obtain higher positioning accuracy.
- Special coating for stainless steel to ensure excellent machining performance.

Specification

- Diameter range 3~16mm
- Cutting edge tolerance m7
- Size
DIN6537K-- > 3xDc
DIN6537L-- > 5xDc
- With internal coolant

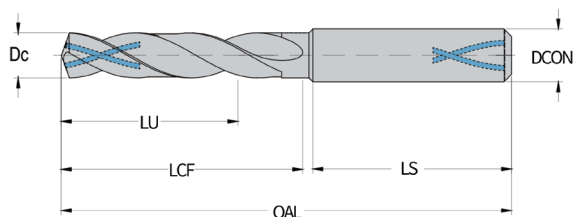
• D151 Solid carbide drill naming system

D	1	51			03			06000	A	1
1	2	3			4			5	6	7

1-Tool group		2-Generation		3-Series		4-Drilling depth	
D	Drill	1		50-59	For stainless	03	3xDc in accordance with DIN 6537K
						05	5xDc in accordance with DIN 6537K

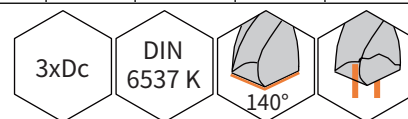
5-Cutting diameter		6-Shank type		7-Coolant	
06000	6.0mm	A	6535 HA cylindrical	0	External coolant
12100	12.1mm			1	Internal coolant

D151 Product list-3xDc



●1st choice ●2nd choice

P	M	K	N	S	H
●	●●	●	●	●●	

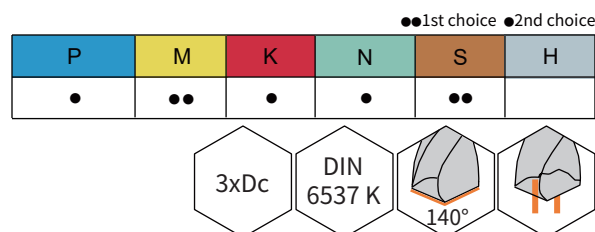
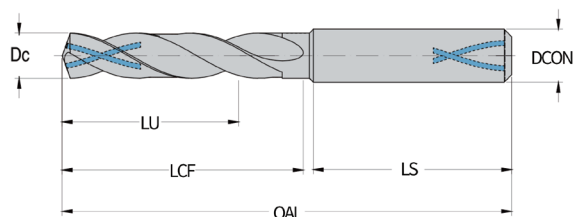


Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-03-03000A1	3	14	62	20	36	4	●
D151-03-03100A1	3.1	14	62	20	36	4	○
D151-03-03175A1	3.175	14	62	20	36	4	○
D151-03-03200A1	3.2	14	62	20	36	4	●
D151-03-03250A1	3.25	14	62	20	36	4	○
D151-03-03300A1	3.3	14	62	20	36	4	●
D151-03-03400A1	3.4	14	62	20	36	4	○
D151-03-03500A1	3.5	14	62	20	36	4	●
D151-03-03572A1	3.572	14	62	20	36	4	○
D151-03-03600A1	3.6	14	62	20	36	4	○
D151-03-03700A1	3.7	14	62	20	36	4	●
D151-03-03800A1	3.8	17	66	24	36	4	○
D151-03-03900A1	3.9	17	66	24	36	4	○
D151-03-03969A1	3.969	17	66	24	36	4	○
D151-03-04000A1	4	17	66	24	36	4	●
D151-03-04100A1	4.1	17	66	24	36	6	○
D151-03-04200A1	4.2	17	66	24	36	6	●
D151-03-04300A1	4.3	17	66	24	36	6	○
D151-03-04366A1	4.366	17	66	24	36	6	○
D151-03-04400A1	4.4	17	66	24	36	6	○
D151-03-04500A1	4.5	17	66	24	36	6	●
D151-03-04600A1	4.6	17	66	24	36	6	○
D151-03-04650A1	4.65	17	66	24	36	6	○
D151-03-04700A1	4.7	17	66	24	36	6	○
D151-03-04763A1	4.763	20	66	28	36	6	○
D151-03-04800A1	4.8	20	66	28	36	6	○
D151-03-04900A1	4.9	20	66	28	36	6	●
D151-03-05000A1	5	20	66	28	36	6	●
D151-03-05100A1	5.1	20	66	28	36	6	○
D151-03-05159A1	5.159	20	66	28	36	6	○
D151-03-05200A1	5.2	20	66	28	36	6	○
D151-03-05300A1	5.3	20	66	28	36	6	○
D151-03-05400A1	5.4	20	66	28	36	6	○
D151-03-05500A1	5.5	20	66	28	36	6	●
D151-03-05550A1	5.55	20	66	28	36	6	○
D151-03-05556A1	5.556	20	66	28	36	6	○
D151-03-05600A1	5.6	20	66	28	36	6	○
D151-03-05700A1	5.7	20	66	28	36	6	○
D151-03-05800A1	5.8	20	66	28	36	6	○
D151-03-05900A1	5.9	20	66	28	36	6	○
D151-03-05953A1	5.953	20	66	28	36	6	○

Special product can be ordered

● Stocked

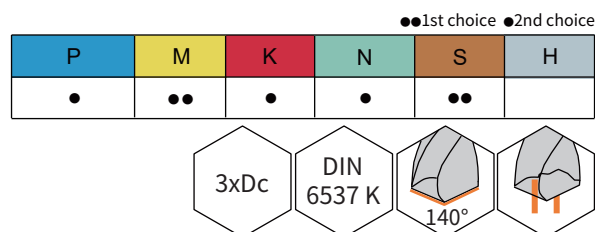
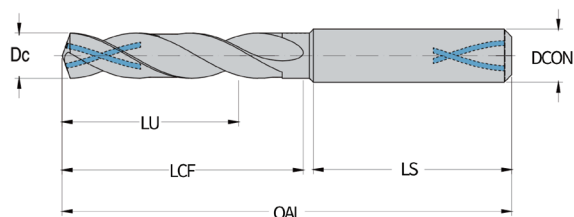
○ Limited Stock



Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-03-06000A1	6	20	66	28	36	6	●
D151-03-06100A1	6.1	24	79	34	36	8	○
D151-03-06200A1	6.2	24	79	34	36	8	○
D151-03-06300A1	6.3	24	79	34	36	8	○
D151-03-06350A1	6.35	24	79	34	36	8	○
D151-03-06400A1	6.4	24	79	34	36	8	○
D151-03-06500A1	6.5	24	79	34	36	8	●
D151-03-06600A1	6.6	24	79	34	36	8	○
D151-03-06700A1	6.7	24	79	34	36	8	○
D151-03-06747A1	6.747	24	79	34	36	8	○
D151-03-06800A1	6.8	24	79	34	36	8	●
D151-03-06900A1	6.9	24	79	34	36	8	○
D151-03-07000A1	7	24	79	34	36	8	●
D151-03-07100A1	7.1	29	79	41	36	8	○
D151-03-07144A1	7.144	29	79	41	36	8	○
D151-03-07200A1	7.2	29	79	41	36	8	○
D151-03-07300A1	7.3	29	79	41	36	8	○
D151-03-07400A1	7.4	29	79	41	36	8	○
D151-03-07500A1	7.5	29	79	41	36	8	●
D151-03-07541A1	7.541	29	79	41	36	8	○
D151-03-07600A1	7.6	29	79	41	36	8	○
D151-03-07700A1	7.7	29	79	41	36	8	○
D151-03-07800A1	7.8	29	79	41	36	8	●
D151-03-07900A1	7.9	29	79	41	36	8	○
D151-03-07938A1	7.938	29	79	41	36	8	○
D151-03-08000A1	8	29	79	41	36	8	●
D151-03-08100A1	8.1	35	89	47	40	10	○
D151-03-08200A1	8.2	35	89	47	40	10	○
D151-03-08300A1	8.3	35	89	47	40	10	○
D151-03-08334A1	8.334	35	89	47	40	10	○
D151-03-08400A1	8.4	35	89	47	40	10	○
D151-03-08500A1	8.5	35	89	47	40	10	●
D151-03-08600A1	8.6	35	89	47	40	10	○
D151-03-08700A1	8.7	35	89	47	40	10	○
D151-03-08731A1	8.731	35	89	47	40	10	○
D151-03-08800A1	8.8	35	89	47	40	10	○
D151-03-08900A1	8.9	35	89	47	40	10	○
D151-03-09000A1	9	35	89	47	40	10	●
D151-03-09100A1	9.1	35	89	47	40	10	○
D151-03-09128A1	9.128	35	89	47	40	10	○
D151-03-09200A1	9.2	35	89	47	40	10	○

Special product can be ordered

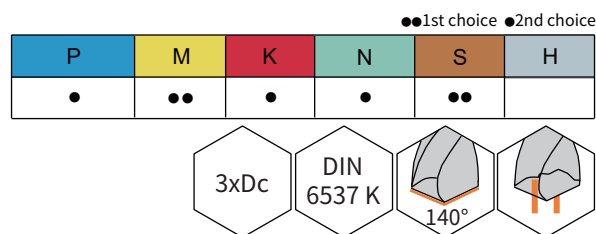
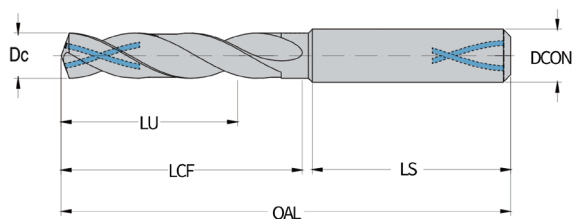
● Stocked
○ Limited Stock



Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-03-09300A1	9.3	35	89	47	40	10	○
D151-03-09400A1	9.4	35	89	47	40	10	○
D151-03-09500A1	9.5	35	89	47	40	10	●
D151-03-09525A1	9.525	35	89	47	40	10	○
D151-03-09600A1	9.6	35	89	47	40	10	○
D151-03-09700A1	9.7	35	89	47	40	10	○
D151-03-09800A1	9.8	35	89	47	40	10	○
D151-03-09900A1	9.9	35	89	47	40	10	○
D151-03-09922A1	9.922	35	89	47	40	10	○
D151-03-10000A1	10	35	89	47	40	10	●
D151-03-10100A1	10.1	40	102	55	45	12	○
D151-03-10200A1	10.2	40	102	55	45	12	●
D151-03-10300A1	10.3	40	102	55	45	12	○
D151-03-10319A1	10.319	40	102	55	45	12	○
D151-03-10400A1	10.4	40	102	55	45	12	○
D151-03-10500A1	10.5	40	102	55	45	12	●
D151-03-10600A1	10.6	40	102	55	45	12	○
D151-03-10700A1	10.7	40	102	55	45	12	○
D151-03-10716A1	10.716	40	102	55	45	12	○
D151-03-10800A1	10.8	40	102	55	45	12	●
D151-03-10900A1	10.9	40	102	55	45	12	○
D151-03-11000A1	11	40	102	55	45	12	●
D151-03-11100A1	11.1	40	102	55	45	12	○
D151-03-11113A1	11.113	40	102	55	45	12	○
D151-03-11200A1	11.2	40	102	55	45	12	○
D151-03-11300A1	11.3	40	102	55	45	12	○
D151-03-11400A1	11.4	40	102	55	45	12	○
D151-03-11500A1	11.5	40	102	55	45	12	●
D151-03-11509A1	11.509	40	102	55	45	12	○
D151-03-11600A1	11.6	40	102	55	45	12	○
D151-03-11700A1	11.7	40	102	55	45	12	○
D151-03-11800A1	11.8	40	102	55	45	12	○
D151-03-11900A1	11.9	40	102	55	45	12	○
D151-03-12000A1	12	40	102	55	45	12	●
D151-03-12100A1	12.1	43	107	60	45	14	○
D151-03-12200A1	12.2	43	107	60	45	14	○
D151-03-12300A1	12.3	43	107	60	45	14	○
D151-03-12303A1	12.303	43	107	60	45	14	○
D151-03-12500A1	12.5	43	107	60	45	14	●
D151-03-12600A1	12.6	43	107	60	45	14	○
D151-03-12700A1	12.7	43	107	60	45	14	○

Special product can be ordered

● Stocked
○ Limited Stock

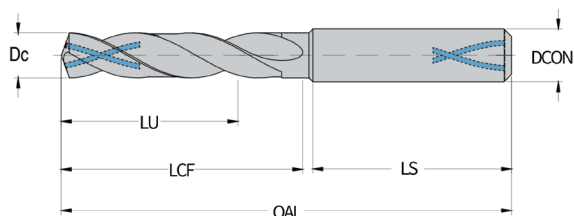


Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-03-12900A1	12.9	43	107	60	45	14	○
D151-03-13000A1	13	43	107	60	45	14	●
D151-03-13100A1	13.1	43	107	60	45	14	○
D151-03-13300A1	13.3	43	107	60	45	14	○
D151-03-13494A1	13.494	43	107	60	45	14	○
D151-03-13500A1	13.5	43	107	60	45	14	●
D151-03-13800A1	13.8	43	107	60	45	14	○
D151-03-14000A1	14	43	107	60	45	14	●
D151-03-14200A1	14.2	45	115	65	48	16	○
D151-03-14288A1	14.288	45	115	65	48	16	○
D151-03-14500A1	14.5	45	115	65	48	16	○
D151-03-14750A1	14.75	45	115	65	48	16	○
D151-03-15000A1	15	45	115	65	48	16	○
D151-03-15100A1	15.1	45	115	65	48	16	○
D151-03-15200A1	15.2	45	115	65	48	16	○
D151-03-15300A1	15.3	45	115	65	48	16	○
D151-03-15500A1	15.5	45	115	65	48	16	○
D151-03-15800A1	15.8	45	115	65	48	16	○
D151-03-16000A1	16	45	115	65	48	16	○

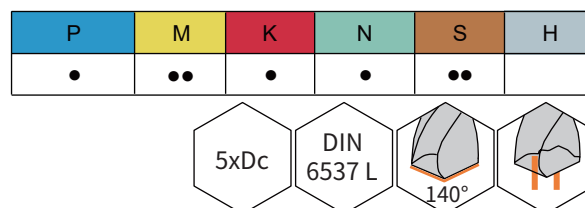
Special product can be ordered

● Stocked
○ Limited Stock

◆ D151 Product list-5xDc



●1st choice ●2nd choice

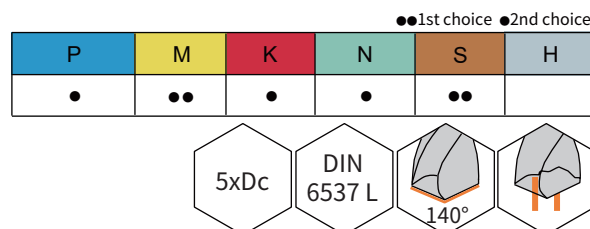
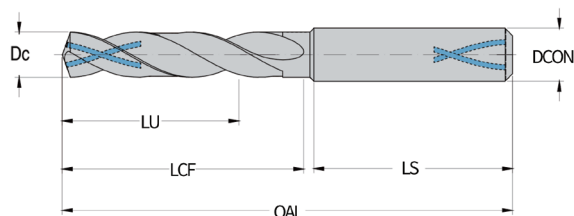


Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-05-03000A1	3	19	66	24	36	4	●
D151-05-03100A1	3.1	19	66	24	36	4	○
D151-05-03175A1	3.175	19	66	24	36	4	○
D151-05-03200A1	3.2	19	66	24	36	4	○
D151-05-03250A1	3.25	19	66	24	36	4	○
D151-05-03300A1	3.3	19	66	24	36	4	●
D151-05-03400A1	3.4	19	66	24	36	4	○
D151-05-03500A1	3.5	19	66	24	36	4	●
D151-05-03572A1	3.572	19	66	24	36	4	○
D151-05-03600A1	3.6	19	66	24	36	4	○
D151-05-03700A1	3.7	19	66	24	36	4	●
D151-05-03800A1	3.8	29	74	36	36	4	○
D151-05-03900A1	3.9	29	74	36	36	4	○
D151-05-03969A1	3.969	29	74	36	36	4	○
D151-05-04000A1	4	29	74	36	36	4	●
D151-05-04100A1	4.1	29	74	36	36	6	○
D151-05-04200A1	4.2	29	74	36	36	6	●
D151-05-04300A1	4.3	29	74	36	36	6	○
D151-05-04366A1	4.366	29	74	36	36	6	○
D151-05-04400A1	4.4	29	74	36	36	6	○
D151-05-04500A1	4.5	29	74	36	36	6	●
D151-05-04600A1	4.6	29	74	36	36	6	○
D151-05-04650A1	4.65	29	74	36	36	6	○
D151-05-04700A1	4.7	29	74	36	36	6	○
D151-05-04763A1	4.763	35	82	44	36	6	○
D151-05-04800A1	4.8	35	82	44	36	6	○
D151-05-04900A1	4.9	35	82	44	36	6	●
D151-05-05000A1	5	35	82	44	36	6	●
D151-05-05100A1	5.1	35	82	44	36	6	○
D151-05-05159A1	5.159	35	82	44	36	6	○
D151-05-05200A1	5.2	35	82	44	36	6	○
D151-05-05300A1	5.3	35	82	44	36	6	○
D151-05-05400A1	5.4	35	82	44	36	6	○
D151-05-05500A1	5.5	35	82	44	36	6	●
D151-05-05550A1	5.55	35	82	44	36	6	○
D151-05-05556A1	5.556	35	82	44	36	6	○
D151-05-05600A1	5.6	35	82	44	36	6	○
D151-05-05700A1	5.7	35	82	44	36	6	○
D151-05-05800A1	5.8	35	82	44	36	6	○
D151-05-05900A1	5.9	35	82	44	36	6	○
D151-05-05953A1	5.953	35	82	44	36	6	○

Special product can be ordered

● Stocked

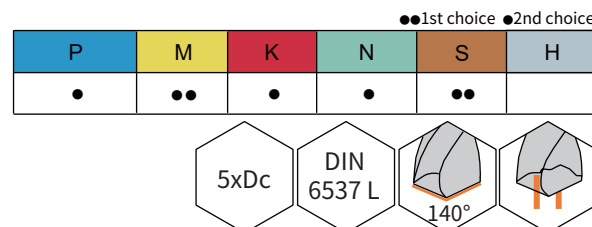
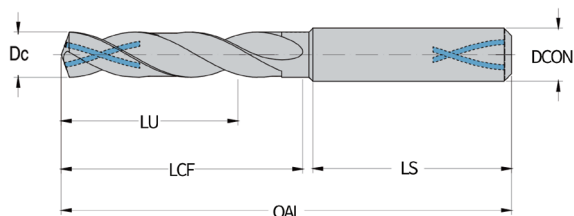
○ Limited Stock



Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-05-06000A1	6	35	82	44	36	6	●
D151-05-06100A1	6.1	43	91	53	36	8	○
D151-05-06200A1	6.2	43	91	53	36	8	○
D151-05-06300A1	6.3	43	91	53	36	8	○
D151-05-06350A1	6.35	43	91	53	36	8	○
D151-05-06400A1	6.4	43	91	53	36	8	○
D151-05-06500A1	6.5	43	91	53	36	8	●
D151-05-06600A1	6.6	43	91	53	36	8	●
D151-05-06700A1	6.7	43	91	53	36	8	○
D151-05-06747A1	6.747	43	91	53	36	8	○
D151-05-06800A1	6.8	43	91	53	36	8	●
D151-05-06900A1	6.9	43	91	53	36	8	○
D151-05-07000A1	7	43	91	53	36	8	●
D151-05-07100A1	7.1	43	91	53	36	8	○
D151-05-07144A1	7.144	43	91	53	36	8	○
D151-05-07200A1	7.2	43	91	53	36	8	○
D151-05-07300A1	7.3	43	91	53	36	8	○
D151-05-07400A1	7.4	43	91	53	36	8	○
D151-05-07500A1	7.5	43	91	53	36	8	●
D151-05-07541A1	7.541	43	91	53	36	8	○
D151-05-07600A1	7.6	43	91	53	36	8	○
D151-05-07700A1	7.7	43	91	53	36	8	○
D151-05-07800A1	7.8	43	91	53	36	8	●
D151-05-07900A1	7.9	43	91	53	36	8	○
D151-05-07938A1	7.938	43	91	53	36	8	○
D151-05-08000A1	8	43	91	53	36	8	●
D151-05-08100A1	8.1	49	103	61	40	10	○
D151-05-08200A1	8.2	49	103	61	40	10	○
D151-05-08300A1	8.3	49	103	61	40	10	○
D151-05-08334A1	8.334	49	103	61	40	10	○
D151-05-08400A1	8.4	49	103	61	40	10	○
D151-05-08500A1	8.5	49	103	61	40	10	●
D151-05-08600A1	8.6	49	103	61	40	10	○
D151-05-08700A1	8.7	49	103	61	40	10	○
D151-05-08731A1	8.731	49	103	61	40	10	○
D151-05-08800A1	8.8	49	103	61	40	10	○
D151-05-08900A1	8.9	49	103	61	40	10	○
D151-05-09000A1	9	49	103	61	40	10	●
D151-05-09100A1	9.1	49	103	61	40	10	○
D151-05-09128A1	9.128	49	103	61	40	10	○
D151-05-09200A1	9.2	49	103	61	40	10	○

Special product can be ordered

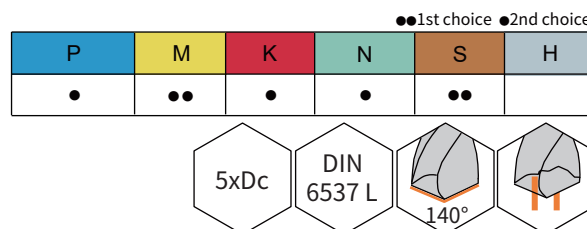
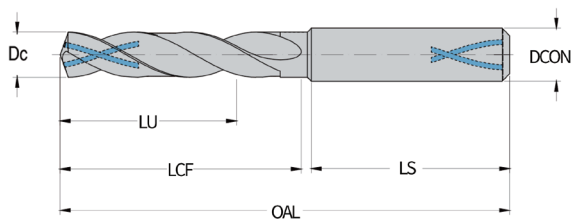
● Stocked
○ Limited Stock



Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-05-09300A1	9.3	49	103	61	40	10	●
D151-05-09400A1	9.4	49	103	61	40	10	○
D151-05-09500A1	9.5	49	103	61	40	10	●
D151-05-09525A1	9.525	49	103	61	40	10	○
D151-05-09600A1	9.6	49	103	61	40	10	○
D151-05-09700A1	9.7	49	103	61	40	10	○
D151-05-09800A1	9.8	49	103	61	40	10	○
D151-05-09900A1	9.9	49	103	61	40	10	○
D151-05-09922A1	9.922	49	103	61	40	10	○
D151-05-10000A1	10	49	103	61	40	10	●
D151-05-10100A1	10.1	56	118	71	45	12	○
D151-05-10200A1	10.2	56	118	71	45	12	●
D151-05-10300A1	10.3	56	118	71	45	12	○
D151-05-10319A1	10.319	56	118	71	45	12	○
D151-05-10400A1	10.4	56	118	71	45	12	○
D151-05-10500A1	10.5	56	118	71	45	12	●
D151-05-10600A1	10.6	56	118	71	45	12	●
D151-05-10700A1	10.7	56	118	71	45	12	○
D151-05-10716A1	10.716	56	118	71	45	12	○
D151-05-10800A1	10.8	56	118	71	45	12	○
D151-05-10900A1	10.9	56	118	71	45	12	○
D151-05-11000A1	11	56	118	71	45	12	●
D151-05-11100A1	11.1	56	118	71	45	12	○
D151-05-11113A1	11.113	56	118	71	45	12	○
D151-05-11200A1	11.2	56	118	71	45	12	○
D151-05-11300A1	11.3	56	118	71	45	12	○
D151-05-11400A1	11.4	56	118	71	45	12	○
D151-05-11500A1	11.5	56	118	71	45	12	●
D151-05-11509A1	11.509	56	118	71	45	12	○
D151-05-11600A1	11.6	56	118	71	45	12	○
D151-05-11700A1	11.7	56	118	71	45	12	○
D151-05-11800A1	11.8	56	118	71	45	12	○
D151-05-11900A1	11.9	56	118	71	45	12	○
D151-05-12000A1	12	56	118	71	45	12	●
D151-05-12100A1	12.1	60	124	77	45	14	○
D151-05-12200A1	12.2	60	124	77	45	14	○
D151-05-12300A1	12.3	60	124	77	45	14	○
D151-05-12303A1	12.303	60	124	77	45	14	○
D151-05-12500A1	12.5	60	124	77	45	14	●
D151-05-12600A1	12.6	60	124	77	45	14	○
D151-05-12700A1	12.7	60	124	77	45	14	○

Special product can be ordered

● Stocked
○ limited stock



Product code	Dc(m7) mm	LU mm	OAL mm	LCF mm	LS mm	DCON(h6) mm	Stock
D151-05-12800A1	12.8	60	124	77	45	14	○
D151-05-13000A1	13	60	124	77	45	14	●
D151-05-13100A1	13.1	60	124	77	45	14	○
D151-05-13300A1	13.3	60	124	77	45	14	○
D151-05-13494A1	13.494	60	124	77	45	14	○
D151-05-13500A1	13.5	60	124	77	45	14	●
D151-05-13800A1	13.8	60	124	77	45	14	○
D151-05-14000A1	14	60	124	77	45	14	●
D151-05-14200A1	14.2	62	133	83	48	16	○
D151-05-14288A1	14.288	62	133	83	48	16	○
D151-05-14400A1	14.4	62	133	83	48	16	○
D151-05-14500A1	14.5	62	133	83	48	16	○
D151-05-14800A1	14.8	62	133	83	48	16	○
D151-05-15000A1	15	62	133	83	48	16	○
D151-05-15100A1	15.1	62	133	83	48	16	○
D151-05-15300A1	15.3	62	133	83	48	16	○
D151-05-15500A1	15.5	62	133	83	48	16	○
D151-05-15800A1	15.8	62	133	83	48	16	○
D151-05-16000A1	16	62	133	83	48	16	○

Special product can be ordered

● Stocked
○ limited stock

Cutting Data for D151 Solid Carbide Drill Family

Vc=Cutting speed (m/min) Feed code = feed reference table see page 12				Drilling depth		3xDc		5xDc	
									
				Product family		D151		D151	
				Dia. Range(mm)		3.00-16.00		3.00-16.00	
				Coolant		Internal coolant		Internal coolant	
Workpiece material				Brinell hardness (HB)	Tensile strength (N/mm2)	Vc	Feed code	Vc	Feed code
P	Unalloyed steel	C≤0.25%	Annealed	125	428	80-120	F	80-120	F
		0.25 < C≤0.55%	Annealed	190	639	80-120	E	80-120	E
		0.25 < C≤0.55%	Heat-treated	210	708	70-100	E	70-100	E
		C > 0.55%	Annealed	190	639	80-120	E	80-120	E
		C > 0.55%	Heat-treated	300	1013	60-80	D	60-80	D
		Free cutting steel (short-chip)	Annealed	220	745	80-120	F	80-120	F
	Low-alloyed steel	Annealed		175	591	70-100	E	70-100	E
		Heat-treated		285	960	60-80	D	60-80	D
		Heat-treated		380	1282	40-50	C	40-50	C
		Heat-treated		430	1477	30-40	B	30-40	B
	High-alloyed steel and high-alloyed tool steel	Annealed		200	675	60-80	D	60-80	D
		Hardened and tempered		300	1013	40-60	C	40-60	C
		Hardened and tempered		400	1361	40-50	C	40-50	C
	Stainless steel	Ferritic/martensitic, annealed		200	675	70-100	D	70-100	D
		Martensitic, heat-treated		330	1114	50-60	C	50-60	C
M	Stainless steel	Austenitic, quench hardened		200	675	50-60	C	50-60	C
		Austenitic, precipitation hardened (PH)		300	1013	50-60	C	50-60	C
		Austenitic/ferritic, duplex		230	778	40-50	B	40-50	B
K	Malleable cast iron	Ferritic		200	400	70-90	G	70-90	G
		Pearlitic		260	700	60-80	G	60-80	G
	Grey cast iron	Low tensile strength		180	200	70-100	H	70-100	H
		High tensile strength/austenitic		245	350	60-80	G	60-80	G
	Cast iron with spheroidal graphite	Ferritic		155	400	80-120	H	80-120	H
		Pearlitic		265	700	60-80	F	60-80	F
	GGV (CGI)			230	400	60-80	F	60-80	F
N	Wrought aluminium alloys	non-aging		30	-	300-400	G	300-400	G
		aged		100	340	300-400	G	300-400	G
	Cast aluminium alloys	≤ 12% Si, non-aging		75	260	180-240	H	180-240	H
		≤ 12% Si, aged		90	310	180-200	H	180-200	H
		> 12% Si, non-aging		130	450	140-180	G	140-180	G
	Magnesium alloys			70	250				
		Unalloyed, electrolytic copper		100	340	140-170	D	120-150	D
		Brass, bronze, red brass		90	310				
		Cu alloys, short-chip		110	380	140-180	F	140-180	F
S	Heat-resistant alloys	Fe-based	Annealed	200	680	30-40	B	30-40	B
			Hardened	280	940	20-30	A	20-25	A
		Ni or Co based	Annealed	250	840	20-30	B	20-30	B
			Hardened	350	1180	10-20	A	10-20	A
			Cast	320	1080	20-30	A	15-25	A
	Titanium alloys	Pure titanium		200	680	40-50	C	40-50	C
		α and β alloys, hardened		375	1260	20-40	B	25-35	B
		β alloys		410	1400	15-25	A	15-25	A
	Tungsten alloys			300	1010	15-25	A	15-25	A
	Molybdenum alloys			300	1010	15-25	A	15-25	A
H	Hardened steel	Hardened and tempered		50HRC					
		Hardened and tempered		55HRC					
		Hardened and tempered		60HRC					
	Chilled cast iron	Hardened and tempered		50HRC					

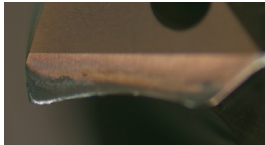
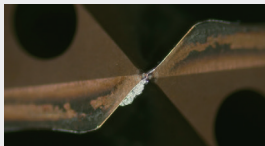
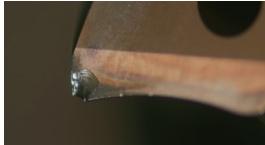
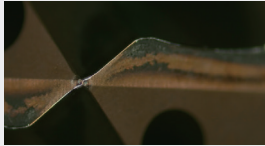
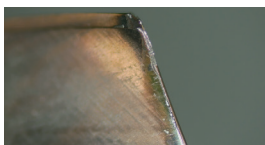
The specified cutting data are average recommended values. For special applications, adjustment is needed.



Feed Reference Table

Feed rate f (mm/ rev)									
Dia. mm		A	B	C	D	E	F	G	H
	3.0	0.03	0.04	0.05	0.06	0.08	0.10	0.12	0.14
	4.0	0.04	0.05	0.06	0.08	0.10	0.12	0.14	0.16
	5.0	0.05	0.06	0.07	0.09	0.10	0.12	0.16	0.18
	6.0	0.05	0.07	0.08	0.10	0.12	0.15	0.18	0.20
	8.0	0.06	0.08	0.10	0.12	0.15	0.18	0.20	0.23
	10.0	0.08	0.10	0.12	0.14	0.18	0.20	0.24	0.28
	12.0	0.10	0.12	0.14	0.18	0.20	0.24	0.28	0.32
	14.0	0.10	0.14	0.18	0.20	0.24	0.28	0.32	0.34
	16.0	0.12	0.15	0.18	0.20	0.25	0.30	0.34	0.36
	20.0	0.15	0.16	0.20	0.25	0.30	0.34	0.37	0.40

Solid Carbide Drill Failure Mode and Solutions

Failures	Picture	Analysis	Solution
Flank wear 		• Abrasion between the work piece and the flank surface leads to flank wear.	• Reduce cutting speed • Raise feed rate • Raise coolant flow (e.g. raise coolant pressure)
Built-up edge 		• The work piece material stick on the cutting edge leads to built-up edge.	• Raise cutting speed • Raise coolant flow (e.g. raise coolant pressure)
Fracture 		• Perpendicular cracks along the edges, chip eroding, vibration and extremely high wear resistance lead to fractures.	• Replace and recondition the tool sooner • Improve stability (work piece/tool)
Plastic deformation 		• High heat and mechanical stress cause plastic deformation.	• Reduce cutting speed • Raise coolant flow (e.g. raise coolant pressure)
Crater wear 		• Tool Material is too soft. • Too high cutting speed. • Too high feed rate.	• Choose more wear resistant grade • Reduce cutting speed • Reduce feed • Raise coolant pressure

• Thread Pilot Hole Diameters Before Tapping

M Metric ISO coarse pitch thread DIN 13 and DIN ISO 965-1			
D	D1		
Tread Size	Min (mm)	Max (mm) 5H/6H	Drill Size
M4	3.242	3.422	3.30
M4.5	3.688	3.878	3.70
M5	4.134	4.334	4.20
M6	4.917	5.153	5.00
M7	5.917	6.153	6.00
M8	6.647	6.912	6.80
M9	7.647	7.912	7.80
M10	8.376	8.676	8.50
M11	9.376	9.676	9.50
M12	10.106	10.441	10.20
M14	11.835	12.210	12.00
M16	13.835	14.210	14.00
M18	15.294	15.744	15.50
M20	17.294	17.744	17.50
M22	19.294	19.744	19.50

UNC Coarse thread ASME B1.1 standard			
D	D1		
Tread Size	Min (mm) 2B/3B	Max (mm) 2B	Drill Size
8-32 UNC	3.302	3.531	3.50
10-24 UNC	3.683	3.962	3.90
12-24 UNC	4.343	4.597	4.50
1/4-20 UNC	4.976	5.268	5.10
5/16-18 UNC	6.411	6.734	6.60
3/8-16 UNC	7.805	8.164	8.00
7/16-14 UNC	9.149	9.550	9.40
1/2-13 UNC	10.584	11.013	10.28
9/16-12 UNC	11.996	12.456	12.20
5/8-11 UNC	13.376	13.868	13.50
3/4-10 UNC	16.299	16.833	16.50
7/8-9 UNC	19.169	19.748	19.50

UNF Fine thread ASME B1.1 standard			
D	D1		
Tread Size	Min (mm) 2B/3B	Max (mm) 2B	Drill Size
8-36 UNF	3.404	3.607	3.50
10-32 UNF	3.962	4.166	4.10
12-28 UNF	4.496	4.724	4.60
1/4-28 UNF	5.367	5.580	5.50
5/16-24 UNF	6.792	7.038	6.90
3/8-24 UNF	8.379	8.626	8.50
7/16-20 UNF	9.738	10.030	9.90
1/2-20 UNF	11.326	11.618	11.50
9/16-18 UNF	12.761	13.084	12.90
5/8-18 UNF	14.348	14.671	14.50
3/4-16 UNF	17.330	17.689	17.50

MF Metric ISO fine pitch thread DIN 13 and DIN ISO 965-1		
D	D1	
Tread Size	Max (mm) 5H/6H	Drill Size
M3.5x0.35	3.221	3.15
M4x0.35	3.721	3.65
M4x0.5	3.599	3.50
M4.5x0.5	4.099	4.00
M5x0.35	4.721	4.65
M5x0.5	4.599	4.50
M5x0.75	4.378	4.20
M5x0.5	5.599	5.50
M6x0.75	5.378	5.25
M7x0.5	6.599	6.50
M7x0.75	6.378	6.25
M8x0.5	7.599	7.50
M8x0.75	7.378	7.25
M8x1	7.153	7.00
M9x0.75	8.378	8.25
M9x1	8.153	8.00
M10x0.5	9.599	9.50
M10x0.75	9.378	9.25
M10x1	9.153	9.00
M10x1.25	8.912	8.75
M11x1	10.153	10.00
M12x0.5	11.599	11.50
M12x1	11.153	11.00
M12x1.25	10.912	10.75
M12x1.5	10.676	10.50
M13x1	12.153	12.00
M14x0.75	13.378	13.20
M14x1	13.153	13.00
M14x1.25	12.912	12.75
M14x1.5	12.676	12.50
M15x1	14.153	14.00
M15x1.5	13.676	13.50
M16x0.75	15.378	15.20
M16x1	15.153	15.00
M16x1.25	14.912	14.80
M16x1.5	14.676	14.50
M17x1	16.153	16.00
M18x1	17.153	17.00
M18x1.5	16.676	16.50
M18x2	16.21	16.00
M20x1	19.153	19.00
M20x1.5	18.676	18.50
M20x2	18.21	18.00



• Thread Pilot Hole Diameters Before Forming

M	Metric ISO coarse pitch thread DIN 13 and DIN ISO 965-1
D	
Tread Size	Drill Size
M3.5	3.25
M4	3.70
M5	4.65
M6	5.55
M8	7.40
M10	9.30
M12	11.20
M14	13.10
M16	15.10
M18	16.90
M20	18.90

MF	Metric ISO fine pitch thread DIN 13 and DIN ISO 965-1
D	
Tread Size	Drill Size
M4x0.5	3.80
M5x0.5	4.80
M6x0.5	5.80
M6x0.75	5.65
M7x0.75	6.65
M8x0.75	7.65
M8x1	7.55
M10x0.75	9.65
M10x1	9.55
M10x1.25	9.40
M12x1	11.55
M12x1.25	11.40
M12x1.5	11.30
M14x1	13.55
M14x1.5	13.30
M16x1	15.55
M16x1.5	15.30
M18x1	17.55
M18x1.5	17.30
M20x1.5	19.30
M20x2	19.10
M22x1.5	21.30

UNC	Coarse thread ASME B1.1 standard
D	
Tread Size	Drill Size
6-32 UNC	3.15
8-32 UNC	3.80
10-24 UNC	4.30
12-24 UNC	5.00
1/4-20 UNC	5.75
5/16-18 UNC	7.25
3/8-16 UNC	8.75
7/16-14 UNC	10.30
1/2-13 UNC	11.80
9/16-12 UNC	13.30
5/8-11 UNC	14.80
3/4-10 UNC	17.90

UNF	Fine thread ASME B1.1 standard
D	
Tread Size	Drill Size
6-40 UNF	3.20
8-36 UNF	3.85
10-32 UNF	4.45
12-28 UNF	5.05
1/4-28 UNF	5.90
5/16-24 UNF	7.45
3/8-24 UNF	9.00
7/16-20 UNF	10.50
1/2-20 UNF	12.10
9/16-18 UNF	13.70
5/8-18 UNF	15.25
3/4-16 UNF	18.40