

CARBIDE DRILL

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DRILLING INTO
STEEL IN GENERAL,
CAST STEEL, CAST IRON,
CHILLED CAST IRON,
MALLEABLE CAST IRON,
NON-FERROUS HEAVY METAL,
NON-FERROUS LIGHT METAL,
ABRASIVE PLASTIC

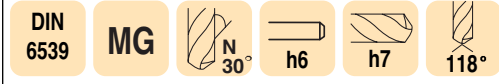


Europa Tool 8TH EDITION

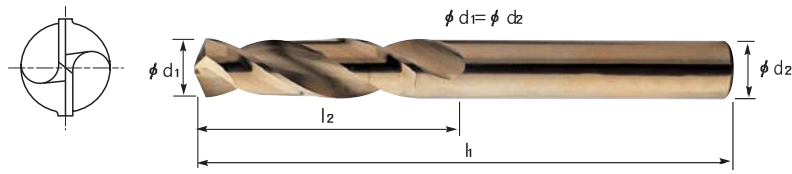
CARBIDE DRILL CONTENTS

PRODUCTS	SERIES	SHANK TYPE	DESCRIPTION	PAGE
	800303	· STRAIGHT	CARBIDE DRILL STUB SERIES(DIN6539)	259/260
	801303	· STRAIGHT	CARBIDE DRILL JOBBER SERIES(DIN338)	261
	802323	· STRAIGHT	CARBIDE TiAIN COATED GOLD DRILLS(DIN6539)	262/263
	803323	· STRAIGHT	CARBIDE TiAIN GOLD DRILLS WITH COOLANT HOLE SHORT(DIN6537)	264/265
	804323	· STRAIGHT	CARBIDE TiAIN GOLD DRILLS WITH COOLANT HOLE LONG(DIN6537)	266/267
	805323	· STRAIGHT	CARBIDE TiAIN GOLD DRILLS WITH COOLANT HOLE EXTRA LONG(DIN6537)	268/269
	806303	· STRAIGHT	CARBIDE NC SPOTTING DRILLS 90°	270
	806403	· STRAIGHT	CARBIDE NC SPOTTING DRILLS 120°	270
CUTTING DATA				271

CARBIDE DRILLS STUB SERIES



Series No. 800303



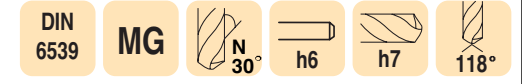
Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

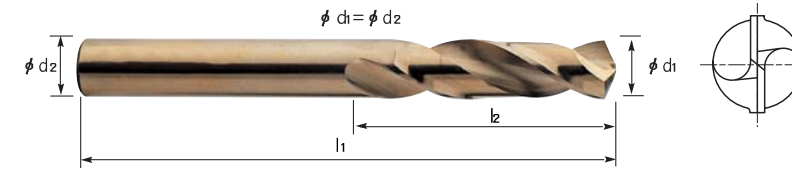
EDP No.	O.D = S.D $d_1 = d_2$	FL l_2	OAL l_1
8003030200	2.0	12	38
8003030210	2.1		
8003030220	2.2		
8003030230	2.3	13	40
8003030240	2.4		
8003030250	2.5		
8003030260	2.6	14	43
8003030270	2.7		
8003030280	2.8		
8003030290	2.9	16	46
8003030300	3.0		
8003030310	3.1		
8003030320	3.2	18	49
8003030330	3.3		
8003030340	3.4		
8003030350	3.5	20	52
8003030360	3.6		
8003030370	3.7		
8003030380	3.8	22	55
8003030390	3.9		
8003030400	4.0		
8003030410	4.1	24	58
8003030420	4.2		
8003030430	4.3		
8003030440	4.4	24	58
8003030450	4.5		
8003030460	4.6		
8003030470	4.7		

EDP No.	O.D = S.D $d_1 = d_2$	FL l_2	OAL l_1
8003030480	4.8	26	62
8003030490	4.9		
8003030500	5.0		
8003030510	5.1	28	66
8003030520	5.2		
8003030530	5.3		
8003030540	5.4	31	70
8003030550	5.5		
8003030560	5.6		
8003030570	5.7	34	74
8003030580	5.8		
8003030590	5.9		
8003030600	6.0	34	74
8003030610	6.1		
8003030620	6.2		
8003030630	6.3	31	70
8003030640	6.4		
8003030650	6.5		
8003030660	6.6	34	74
8003030670	6.7		
8003030680	6.8		
8003030690	6.9	34	74
8003030700	7.0		
8003030710	7.1		
8003030720	7.2	34	74
8003030730	7.3		
8003030740	7.4		
8003030750	7.5		

CARBIDE DRILLS STUB SERIES



Series No. 800303



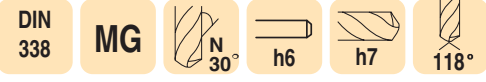
Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

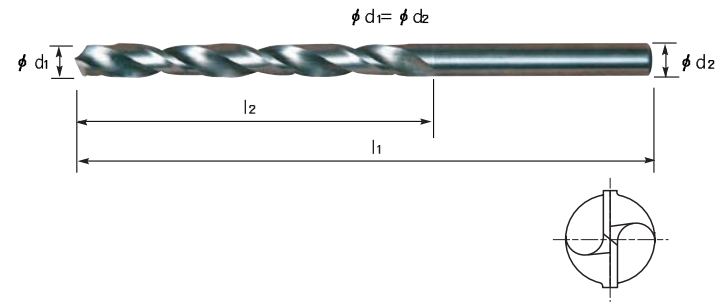
EDP No.	O.D = S.D $d_1 = d_2$	FL l_2	OAL l_1
8003030760	7.6	37	79
8003030770	7.7		
8003030780	7.8		
8003030790	7.9	40	84
8003030800	8.0		
8003030810	8.1		
8003030820	8.2	43	89
8003030830	8.3		
8003030840	8.4		
8003030850	8.5	47	95
8003030860	8.6		
8003030870	8.7		
8003030880	8.8	51	102
8003030890	8.9		
8003030900	9.0		
8003030910	9.1		

EDP No.	O.D = S.D $d_1 = d_2$	FL l_2	OAL l_1
8003030920	9.2	40	84
8003030930	9.3		
8003030940	9.4		
8003030950	9.5	43	89
8003030960	9.6		
8003030970	9.7		
8003030980	9.8	47	95
8003030990	9.9		
8003031000	10.0		
8003031020	10.2	51	102
8003031050	10.5		
8003031100	11.0		
8003031150	11.5	51	102
8003031200	12.0		
8003031300	13.0		

CARBIDE DRILLS JOBBER SERIES



Series No. 801303



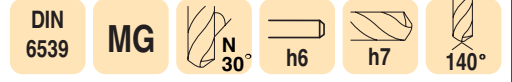
Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

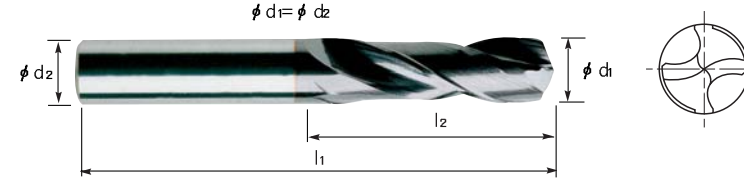
EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8013030200	2.0	24	49
8013030210	2.1		
8013030220	2.2	27	53
8013030230	2.3		
8013030240	2.4		
8013030250	2.5	30	57
8013030260	2.6		
8013030270	2.7		
8013030280	2.8	33	61
8013030290	2.9		
8013030300	3.0		
8013030310	3.1		
8013030320	3.2	36	65
8013030330	3.3		
8013030340	3.4		
8013030350	3.5	39	70
8013030360	3.6		
8013030370	3.7		
8013030380	3.8		
8013030390	3.9		
8013030400	4.0	43	75
8013030410	4.1		
8013030420	4.2		
8013030430	4.3		
8013030440	4.4	47	80
8013030450	4.5		

EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8013030460	4.6	47	80
8013030470	4.7		
8013030480	4.8		
8013030490	4.9		
8013030500	5.0	52	86
8013030510	5.1		
8013030520	5.2		
8013030530	5.3		
8013030540	5.4		
8013030550	5.5		
8013030560	5.6		
8013030570	5.7	57	93
8013030580	5.8		
8013030590	5.9		
8013030600	6.0		
8013030610	6.1		
8013030620	6.2		
8013030630	6.3	63	101
8013030640	6.4		
8013030650	6.5		
8013030680	6.8		
8013030700	7.0	69	109
8013030800	8.0		
8013030850	8.5	75	117
8013031000	10.0		
8013031020	10.2	87	113

CARBIDE GOLD DRILLS



Series No. 802323



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

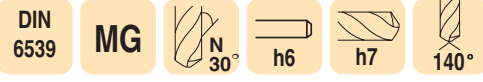
Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8023230300	3.0	16	46
8023230310	3.1		
8023230320	3.2	18	49
8023230330	3.3		
8023230340	3.4		
8023230350	3.5		
8023230360	3.6	20	52
8023230370	3.7		
8023230380	3.8		
8023230390	3.9		
8023230400	4.0	22	55
8023230410	4.1		
8023230420	4.2		
8023230430	4.3		
8023230440	4.4		
8023230450	4.5	24	58
8023230460	4.6		
8023230470	4.7		
8023230480	4.8		
8023230490	4.9		
8023230500	5.0	26	62
8023230510	5.1		
8023230520	5.2		

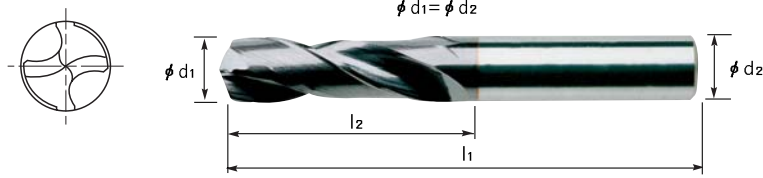
EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8023230530	5.3	26	62
8023230540	5.4		
8023230550	5.5		
8023230560	5.6		
8023230570	5.7	28	66
8023230580	5.8		
8023230590	5.9		
8023230600	6.0		
8023230610	6.1		
8023230620	6.2		
8023230630	6.3		
8023230640	6.4	31	70
8023230650	6.5		
8023230660	6.6		
8023230670	6.7		
8023230680	6.8		
8023230690	6.9		
8023230700	7.0		
8023230710	7.1	34	74
8023230720	7.2		
8023230730	7.3		
8023230740	7.4		
8023230750	7.5		

CARBIDE GOLD DRILLS



Series No. 802323

TiAIN



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8023230760	7.6	37	79
8023230770	7.7		
8023230780	7.8		
8023230790	7.9		
8023230800	8.0		
8023230810	8.1		
8023230820	8.2		
8023230830	8.3		
8023230840	8.4		
8023230850	8.5		
8023230860	8.6	40	84
8023230870	8.7		
8023230880	8.8		
8023230890	8.9		
8023230900	9.0		
8023230910	9.1		
8023230920	9.2		
8023230930	9.3		
8023230940	9.4		
8023230950	9.5		
8023230960	9.6	43	89
8023230970	9.7		
8023230980	9.8		

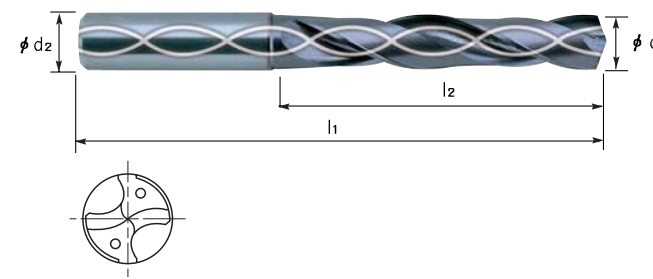
EDP No.	O.D = S.D d ₁ = d ₂	FL l ₂	OAL l ₁
8023230990	9.9	43	89
8023231000	10.0		
8023231020	10.2		
8023231050	10.5	47	95
8023231100	11.0		
8023231150	11.5		
8023231200	12.0	51	102
8023231300	13.0		
8023231350	13.5		
8023231400	14.0	54	107
8023231450	14.5		
8023231500	15.0		
8023231550	15.5	56	111
8023231600	16.0		
8023231650	16.5		
8023231700	17.0	60	119
8023231750	17.5		
8023231800	18.0		
8023231850	18.5	62	123
8023231900	19.0		
8023231950	19.5		
8023232000	20.0	64	127
		66	131

CARBIDE GOLD DRILLS with COOLANT HOLE SHORT



Series No. 803323

TiAIN



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8033230300	3.0	6.0	20	62
8033230310	3.1			
8033230320	3.2			
8033230330	3.3			
8033230340	3.4			
8033230350	3.5			
8033230360	3.6			
8033230370	3.7			
8033230380	3.8			
8033230390	3.9			
8033230400	4.0	6.0	24	66
8033230410	4.1			
8033230420	4.2			
8033230430	4.3			
8033230440	4.4			
8033230450	4.5			
8033230460	4.6			
8033230470	4.7			
8033230480	4.8			
8033230490	4.9			
8033230500	5.0	6.0	28	66
8033230510	5.1			
8033230520	5.2			
8033230530	5.3			
8033230540	5.4			
8033230550	5.5			
8033230560	5.6			
8033230570	5.7			
8033230580	5.8			
8033230590	5.9			
8033230600	6.0	8.0	34	79
8033230610	6.1			
8033230620	6.2			

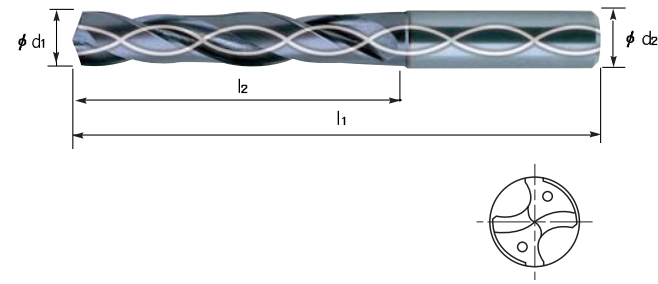
EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8033230630	6.3	8.0	34	79
8033230640	6.4			
8033230650	6.5			
8033230660	6.6			
8033230670	6.7			
8033230680	6.8			
8033230690	6.9			
8033230700	7.0			
8033230710	7.1			
8033230720	7.2			
8033230730	7.3	8.0	41	79
8033230740	7.4			
8033230750	7.5			
8033230760	7.6			
8033230770	7.7			
8033230780	7.8			
8033230790	7.9			
8033230800	8.0			
8033230810	8.1			
8033230820	8.2			
8033230830	8.3			
8033230840	8.4			
8033230850	8.5			
8033230860	8.6			
8033230870	8.7			
8033230880	8.8			
8033230890	8.9			
8033230900	9.0			
8033230910	9.1			
8033230920	9.2			
8033230930	9.3			
8033230940	9.4			
8033230950	9.5			

CARBIDE GOLD DRILLS with COOLANT HOLE SHORT



Series No. 803323

TiAlN



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8033230960	9.6	10.0	47	89
8033230970	9.7			
8033230980	9.8			
8033230990	9.9			
8033231000	10.0			
8033231010	10.1	12.0	55	102
8033231020	10.2			
8033231030	10.3			
8033231040	10.4			
8033231050	10.5			
8033231060	10.6			
8033231070	10.7			
8033231080	10.8			
8033231090	10.9			
8033231100	11.0			
8033231110	11.1			
8033231120	11.2			
8033231130	11.3			
8033231140	11.4			
8033231150	11.5			
8033231160	11.6			
8033231170	11.7			
8033231180	11.8			
8033231190	11.9			

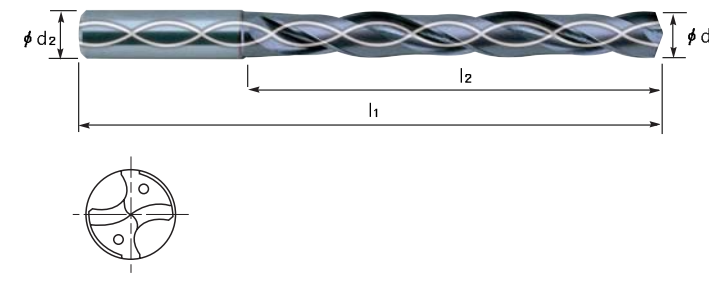
EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8033231200	12.0	12.0	55	102
8033231250	12.5	14.0	60	107
8033231300	13.0			
8033231350	13.5			
8033231400	14.0	16.0	65	115
8033231450	14.5			
8033231500	15.0			
8033231550	15.5			
8033231600	16.0			
8033231650	16.5	18.0	73	123
8033231700	17.0			
8033231750	17.5			
8033231800	18.0	20.0	79	131
8033231850	18.5			
8033231900	19.0			
8033231950	19.5			
8033232000	20.0			

CARBIDE GOLD DRILLS with COOLANT HOLE LONG



Series No. 804323

TiAlN



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

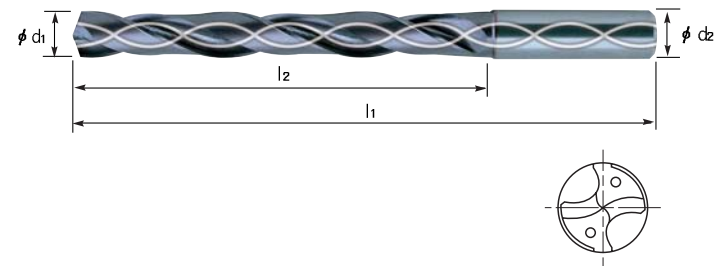
EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8043230300	3.0	6.0	28	66
8043230310	3.1			
8043230320	3.2			
8043230330	3.3			
8043230340	3.4			
8043230350	3.5			
8043230360	3.6			
8043230370	3.7			
8043230380	3.8			
8043230390	3.9			
8043230400	4.0	6.0	36	74
8043230410	4.1			
8043230420	4.2			
8043230430	4.3			
8043230440	4.4			
8043230450	4.5			
8043230460	4.6			
8043230470	4.7			
8043230480	4.8			
8043230490	4.9			
8043230500	5.0	6.0	44	82
8043230510	5.1			
8043230520	5.2			
8043230530	5.3			
8043230540	5.4			
8043230550	5.5			
8043230560	5.6			
8043230570	5.7			
8043230580	5.8			
8043230590	5.9			
8043230600	6.0	8.0	53	91
8043230610	6.1			
8043230620	6.2			

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8043230630	6.3	8.0	53	91
8043230640	6.4			
8043230650	6.5			
8043230660	6.6			
8043230670	6.7			
8043230680	6.8			
8043230690	6.9			
8043230700	7.0			
8043230710	7.1			
8043230720	7.2			
8043230730	7.3	10.0	61	103
8043230740	7.4			
8043230750	7.5			
8043230760	7.6			
8043230770	7.7			
8043230780	7.8			
8043230790	7.9			
8043230800	8.0			
8043230810	8.1			
8043230820	8.2			
8043230830	8.3			
8043230840	8.4			
8043230850	8.5			
8043230860	8.6			
8043230870	8.7			
8043230880	8.8			
8043230890	8.9			
8043230900	9.0			
8043230910	9.1			
8043230920	9.2			
8043230930	9.3			
8043230940	9.4			
8043230950	9.5			

CARBIDE GOLD DRILLS with COOLANT HOLE LONG



Series No. 804323



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

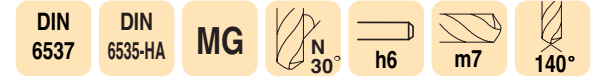
Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

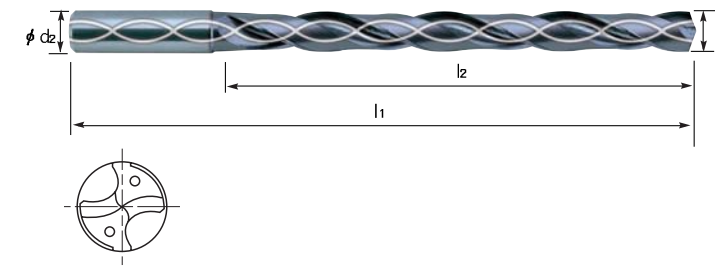
EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8043230960	9.6	10.0	61	103
8043230970	9.7			
8043230980	9.8			
8043230990	9.9			
8043231000	10.0			
8043231010	10.1	12.0	71	118
8043231020	10.2			
8043231030	10.3			
8043231040	10.4			
8043231050	10.5			
8043231060	10.6			
8043231070	10.7			
8043231080	10.8			
8043231090	10.9			
8043231100	11.0			
8043231110	11.1			
8043231120	11.2			
8043231130	11.3			
8043231140	11.4			
8043231150	11.5			
8043231160	11.6			
8043231170	11.7			
8043231180	11.8			
8043231190	11.9			

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8043231200	12.0	12.0	71	118
8043231250	12.5	14.0	77	124
8043231300	13.0			
8043231350	13.5			
8043231400	14.0			
8043231450	14.5	16.0	83	133
8043231500	15.0			
8043231550	15.5			
8043231600	16.0			
8043231650	16.5	18.0	93	143
8043231700	17.0			
8043231750	17.5			
8043231800	18.0			
8043231850	18.5	20.0	101	153
8043231900	19.0			
8043231950	19.5			
8043232000	20.0			

CARBIDE GOLD DRILLS with COOLANT HOLE EXTRA LONG



Series No. 805323



Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

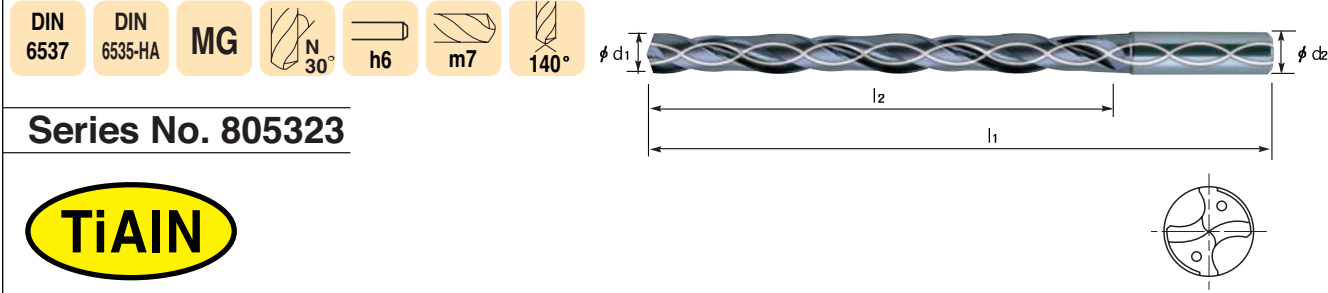
Advantage :

Self centering - center drilling is not required
Excellent positioning - bush is not necessary
Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8053230300	3.0	6.0	34	72
8053230310	3.1			
8053230320	3.2			
8053230330	3.3			
8053230340	3.4			
8053230350	3.5			
8053230360	3.6			
8053230370	3.7			
8053230380	3.8	6.0	43	81
8053230390	3.9			
8053230400	4.0			
8053230410	4.1			
8053230420	4.2			
8053230430	4.3			
8053230440	4.4			
8053230450	4.5	6.0	57	95
8053230460	4.6			
8053230470	4.7			
8053230480	4.8			
8053230490	4.9			
8053230500	5.0			
8053230510	5.1			
8053230520	5.2			

EDP No.	O.D d ₁	S.D d ₂	FL l ₂	OAL l ₁
8053230530	5.3	6.0	57	95
8053230540	5.4			
8053230550	5.5			
8053230560	5.6			
8053230570	5.7			
8053230580	5.8	8.0	76	114
8053230590	5.9			
8053230600	6.0			
8053230610	6.1			
8053230620	6.2			
8053230630	6.3			
8053230640	6.4			
8053230650	6.5			
8053230660	6.6			
8053230670	6.7			
8053230680	6.8			
8053230690	6.9			
8053230700	7.0			
8053230710	7.1			
8053230720	7.2			
8053230730	7.3			
8053230740	7.4			
8053230750	7.5			

CARBIDE GOLD DRILLS with COOLANT HOLE EXTRA LONG



Series No. 805323

TiAIN

Application :

Drilling into steel in general, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

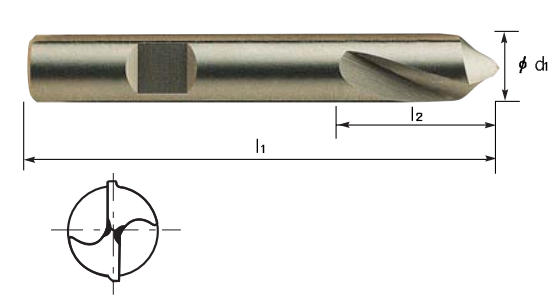
Advantage :

Self centering - center drilling is not required
 Excellent positioning - bush is not necessary
 Special design - reaming is not required, good chip removal, powerful drilling

EDP No.	O.D d_1	S.D d_2	FL l_2	OAL l_1
8053230760	7.6	8.0	76	114
8053230770	7.7			
8053230780	7.8			
8053230790	7.9			
8053230800	8.0			
8053230810	8.1	10.0	95	142
8053230820	8.2			
8053230830	8.3			
8053230840	8.4			
8053230850	8.5			
8053230860	8.6			
8053230870	8.7			
8053230880	8.8			
8053230890	8.9			
8053230900	9.0			
8053230910	9.1			
8053230920	9.2			
8053230930	9.3			
8053230940	9.4			
8053230950	9.5			
8053230960	9.6			
8053230970	9.7			
8053230980	9.8			

EDP No.	O.D d_1	S.D d_2	FL l_2	OAL l_1
8053230990	9.9	10.0	95	142
8053231000	10.0			
8053231010	10.1			
8053231020	10.2			
8053231030	10.3			
8053231040	10.4			
8053231050	10.5			
8053231060	10.6			
8053231070	10.7			
8053231080	10.8			
8053231090	10.9	12.0	114	162
8053231100	11.0			
8053231110	11.1			
8053231120	11.2			
8053231130	11.3			
8053231140	11.4			
8053231150	11.5			
8053231160	11.6			
8053231170	11.7			
8053231180	11.8			
8053231190	11.9			
8053231200	12.0			

CARBIDE NC SPOTTING DRILLS



MG
 DIN6535HB
 h6
 90°
 120°
 Series No. 806303, 806403

Application :

For more precise centering work on NC/CNC Machine.
 A larger diameter in respect to the subsequent drilling tool permits to obtain the centering and chamfering simultaneously.

NC-Spotting drills 90°

EDP No.	O.D d_1	FL l_2	OAL l_1
8063030600	6.0	13	50
8063030800	8.0	23	60
8063031000	10.0	24	70
8063031200	12.0		
8063031600	16.0	29	75
8063032000	20.0	35	100

NC-Spotting drills 120°

EDP No.	O.D d_1	FL l_2	OAL l_1
8064030600	6.0	13	50
8064030800	8.0	23	60
8064031000	10.0	24	70
8064031200	12.0		
8064031600	16.0	29	75
8064032000	20.0	35	100

CARBIDE DRILL CUTTING CONDITION

800303, 801303



MATERIAL	Tool steels Alloy steels		Aluminum Aluminum alloy		Titan alloy		Brass Bronze		Glass fiber Epoxy resin	
	N	S	N	S	N	S	N	S	N	S
3	4000~7000	0.020	10000~13100	0.028	3000~6000	0.010	7000~10000	0.020	9000~12000	0.075
5	2400~4200	0.028	6000~7800	0.048	1800~3600	0.020	4200~6000	0.038	5400~7200	0.075
8	1500~2600	0.048	3700~4900	0.085	1100~2200	0.038	2600~3700	0.075	3400~4500	0.095
12	1000~1700	0.065	2500~3200	0.125	750~1500	0.065	1700~2500	0.125	2200~3000	0.115

N = R.P.M (rev./min)
S = Feed per revolution (mm/rev.)

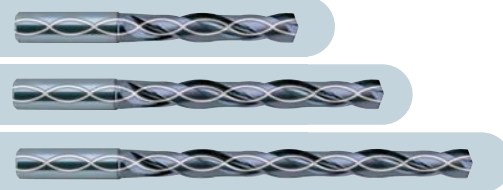
802323 (TiAlN Coated)



MATERIAL	NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON		STAINLESS STEELS		AI-SI ALLOY, SI <10%		AI-SI ALLOY, SI >10%	
	< 700 N/mm ²		< 1000 N/mm ²		< HB240, GG25		< HB300, GG40		-		-		-	
DIA.	N	S	N	S	N	S	N	S	N	S	N	S	N	S
3~5	8330	0.130	7410	0.130	13890	0.160	9260	0.130	3240	0.060	14310	0.200	11780	0.160
5.1~8	5020	0.160	4460	0.160	8370	0.210	5570	0.160	1950	0.080	8620	0.260	7090	0.210
8.1~10	3490	0.230	3110	0.230	5810	0.290	3880	0.230	1350	0.110	6000	0.360	4940	0.290
10.1~12	2850	0.280	2530	0.280	4750	0.350	3160	0.280	1110	0.140	4900	0.440	4030	0.350
12.1~14	2410	0.310	2140	0.310	4010	0.400	2670	0.310	940	0.160	4130	0.500	3400	0.400
14.1~20	1890	0.350	1680	0.350	3150	0.450	2090	0.350	730	0.180	3240	0.560	2670	0.450

N = R.P.M (rev./min)
S = Feed per revolution (mm/rev.)

803323, 804323, 805323 (TiAlN Coated)



MATERIAL	NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON		STAINLESS STEELS		AI-SI ALLOY, SI <10%		AI-SI ALLOY, SI >10%	
	< 700 N/mm ²		< 1000 N/mm ²		< HB240, GG25		< HB300, GG40		-		-		-	
DIA.	N	S	N	S	N	S	N	S	N	S	N	S	N	S
3~5	9260	0.160	8330	0.130	15740	0.160	10190	0.160	3710	0.060	16830	0.200	14310	0.200
5.1~8	5570	0.210	5020	0.160	9480	0.210	6130	0.210	2230	0.080	10130	0.260	8620	0.260
8.1~10	3880	0.290	3490	0.230	6600	0.290	4270	0.290	1550	0.110	7060	0.360	6000	0.360
10.1~12	3160	0.350	2850	0.280	5380	0.350	3480	0.350	1270	0.140	5760	0.440	4900	0.440
12.1~14	2670	0.400	2410	0.310	4550	0.400	2950	0.400	1070	0.160	4870	0.500	4130	0.500
14.1~20	2090	0.450	1890	0.350	3570	0.450	2310	0.450	840	0.180	3820	0.560	3240	0.560

N = R.P.M (rev./min)
S = Feed per revolution (mm/rev.)

