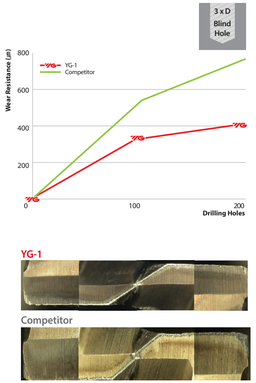
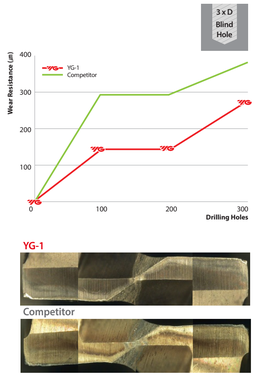
▶ Ø8.0mm, Steel

Tool	YG-1 CDRA03080	Competitor
O.D Size	Ø8.0	
Work Material	DIN: X155CrVMo121 AISI: D2 JIS: SKD11(HRc20)	
Cutting Speed	15 m/min. (49.2 ft/min.)	
RPM	600 rev./min.	
Feed	0.18 mm/rev. (0.0071 in/rev.)	
Drilling Method	Blind Hole / without Pecking	
Drilling Depth	24.0 mm (3XD)	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



▶ Ø8.0mm, Stainless Steel

Tool	YG-1 CDRA03080	Competitor
O.D Size	Ø8.0	
Work Material	DIN: X5CrNiMo17-12-2 AISI: 316 JIS: SUS316(HRc10)	
Cutting Speed	15 m/min. (49.2 ft/min.)	
RPM	600 rev./min.	
Feed	0.18 mm/rev. (0.0071 in/rev.)	
Drilling Method	Blind Hole / without Pecking	
Drilling Depth	24.0 mm (3XD)	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



YE-ML20

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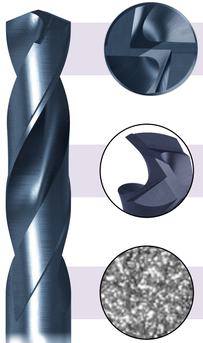
YG1ML200108003

Wide range of work materials P M K N S

Carbon Steels, Alloy Steels, Structural Steels, Hardened Steels(HRc 30-45), Cast Iron, Stainless Steels, Aluminum and Titanium



Point Shape to Maximize Self-centering

▶ Excellent positioning - bushing is not necessary

Flute Design for the Best Chip Evacuation

▶ Prevent chip clogging and reduce axial thrust

Premium Powder Material with Excellent Toughness

▶ Improve cutting edge strength with higher stability and rigidity

RPM = rev./min, FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc (m/min)	Parameter	Drill Diameter (mm) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	40	RPM	6370	4240	3180	2550	2120	1590	1270	1060
				FEED	0.03-0.06	0.08-0.12	0.09-0.15	0.12-0.18	0.14-0.20	0.18-0.24	0.18-0.28	0.20-0.30
	2		35	RPM	5570	3710	2790	2230	1860	1390	1110	930
				FEED	0.03-0.06	0.08-0.12	0.09-0.15	0.12-0.18	0.14-0.20	0.18-0.24	0.18-0.28	0.20-0.30
	3		35	RPM	5570	3710	2790	2230	1860	1390	1110	930
				FEED	0.03-0.06	0.08-0.12	0.09-0.15	0.12-0.18	0.14-0.20	0.18-0.24	0.18-0.28	0.20-0.30
	6	Low alloy steel	35	RPM	5570	3710	2790	2230	1860	1390	1110	930
				FEED	0.03-0.06	0.08-0.12	0.09-0.15	0.12-0.18	0.14-0.20	0.18-0.24	0.18-0.28	0.20-0.30
	7		30	RPM	4770	3180	2390	1910	1590	1190	950	800
				FEED	0.03-0.05	0.06-0.10	0.07-0.13	0.10-0.16	0.12-0.18	0.14-0.20	0.14-0.24	0.16-0.26
	8		25	RPM	3980	2650	1990	1590	1330	990	800	660
				FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12	0.07-0.13	0.10-0.20	0.12-0.22	0.14-0.24
	9		20	RPM	3180	2120	1590	1270	1060	800	640	530
				FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12	0.07-0.13	0.10-0.20	0.12-0.22	0.14~0.24
M	12	Stainless steel	20	RPM	3180	2120	1590	1270	1060	800	640	530
				FEED	0.03-0.07	0.05-0.09	0.06-0.12	0.09-0.15	0.12-0.18	0.18-0.24	0.20-0.30	0.26-0.36
	14		15	RPM	2390	1590	1190	950	800	600	480	400
				FEED	0.02-0.05	0.03-0.07	0.04-0.10	0.06-0.12	0.07-0.13	0.10-0.20	0.12-0.22	0.14-0.24
K	15	Grey cast iron	40	RPM	6370	4240	3180	2550	2120	1590	1270	1060
				FEED	0.04-0.10	0.07-0.13	0.09-0.15	0.12-0.18	0.13-0.19	0.18-0.24	0.20-0.30	0.22-0.32
N	21	Aluminum-wrought alloy	90	RPM	14320	9550	7160	5730	4770	3580	2860	2390
				FEED	0.13-0.17	0.23-0.27	0.27-0.33	0.33-0.39	0.40-0.46	0.45-0.51	0.51-0.61	0.63-0.73
	22		90	RPM	14320	9550	7160	5730	4770	3580	2860	2390
				FEED	0.13-0.17	0.23-0.27	0.27-0.33	0.33-0.39	0.40-0.46	0.45-0.51	0.51-0.61	0.63-0.73
	23	Aluminum-cast, alloyed	80	RPM	12730	8490	6370	5090	4240	3180	2550	2120
				FEED	0.13-0.17	0.23-0.27	0.27-0.33	0.33-0.39	0.40-0.46	0.45-0.51	0.51-0.61	0.63-0.73
	24		70	RPM	11140	7430	5570	4460	3710	2790	2230	1860
				FEED	0.10-0.14	0.15-0.19	0.20-0.26	0.24-0.30	0.28-0.34	0.30-0.36	0.34-0.44	0.36-0.46
S	36	Titanium Alloys	5	RPM	800	530	400	320	270	200	160	130
				FEED	0.02-0.05	0.03-0.07	0.04-0.08	0.06-0.12	0.07-0.13	0.09-0.15	0.12-0.22	0.14-0.24

HSS-PM MULTI-1 DRILLS

STUB CDRA03 SERIES

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc 30-45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

HSS PM | 30° | h6 | h7 | 118° | 135°

up to 1.9mm over 1.9mm

P. 2

Unit: mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03010	**1.00**	3	6	38
CDRA03910	**1.05**	3	6	38
CDRA03011	**1.10**	3	7	39
CDRA03911	**1.15**	3	7	39
CDRA03012	**1.20**	3	8	40
CDRA03912	**1.25**	3	8	40
CDRA03013	**1.30**	3	8	40
CDRA03913	**1.35**	3	9	41
CDRA03014	**1.40**	3	9	41
CDRA03914	**1.45**	3	9	41
CDRA03015	**1.50**	3	9	41
CDRA03915	**1.55**	3	10	42
CDRA03016	**1.60**	3	10	42
CDRA03916	**1.65**	3	10	42
CDRA03017	**1.70**	3	10	42
CDRA03917	**1.75**	3	11	43
CDRA03018	**1.80**	3	11	43
CDRA03918	**1.85**	3	11	43
CDRA03019	**1.90**	3	11	43
CDRA03919	**1.95**	3	12	44
CDRA03020	**2.00**	3	12	44
CDRA03021	**2.10**	3	12	44
CDRA03921	**2.15**	3	13	45
CDRA03022	**2.20**	3	13	45
CDRA03922	**2.25**	3	13	45
CDRA03023	**2.30**	3	13	45
CDRA03924	**2.40**	3	14	46
CDRA03924	**2.45**	3	14	46
CDRA03025	**2.50**	3	14	46
CDRA03925	**2.55**	3	14	46
CDRA03026	**2.60**	3	14	46
CDRA03926	**2.65**	3	14	46
CDRA03027	**2.70**	3	16	48
CDRA03927	**2.75**	3	16	48
CDRA03028	**2.80**	3	16	48
CDRA03928	**2.85**	3	16	48
CDRA03029	**2.90**	3	16	48
CDRA03929	**2.95**	3	16	48
CDRA03030	**3.00**	3	16	48
CDRA03930	**3.05**	4	18	50
CDRA03031	**3.10**	4	18	50
CDRA03931	**3.15**	4	18	50
CDRA03032	**3.20**	4	18	50
CDRA03932	**3.25**	4	18	50
CDRA03033	**3.30**	4	18	50
CDRA03933	**3.35**	4	18	50
CDRA03034	**3.40**	4	20	52
CDRA03934	**3.45**	4	20	52
CDRA03035	**3.50**	4	20	52
CDRA03935	**3.55**	4	20	52
CDRA03036	**3.60**	4	20	52
CDRA03936	**3.65**	4	20	52
CDRA03037	**3.70**	4	20	52
CDRA03937	**3.75**	4	20	52
CDRA03038	**3.80**	4	22	54
CDRA03938	**3.85**	4	22	54
CDRA03039	**3.90**	4	22	54
CDRA03939	**3.95**	4	22	54
CDRA03040	**4.00**	4	22	54
CDRA03940	**4.05**	6	22	66
CDRA03041	**4.10**	6	22	66
CDRA03941	**4.15**	6	22	66
CDRA03042	**4.20**	6	22	66
CDRA03942	**4.25**	6	22	66
CDRA03043	**4.30**	6	24	68
CDRA03044	**4.40**	6	24	68
CDRA03944	**4.45**	6	24	68
CDRA03045	**4.50**	6	24	68
CDRA03945	**4.55**	6	24	68
CDRA03046	**4.60**	6	24	68
CDRA03946	**4.65**	6	24	68
CDRA03047	**4.70**	6	24	68
CDRA03947	**4.75**	6	24	68
CDRA03048	**4.80**	6	26	70
CDRA03948	**4.85**	6	26	70
CDRA03049	**4.90**	6	26	70
CDRA03949	**4.95**	6	26	70
CDRA03050	**5.00**	6	26	70
CDRA03950	**5.05**	6	26	70
CDRA03051	**5.10**	6	26	70
CDRA03951	**5.15**	6	26	70
CDRA03052	**5.20**	6	26	70
CDRA03952	**5.25**	6	26	70
CDRA03053	**5.30**	6	26	70
CDRA03953	**5.35**	6	28	72
CDRA03054	**5.40**	6	28	72
CDRA03954	**5.45**	6	28	72

▶ NEXT PAGE

○ : Excellent ○ : Good

ISO Material Description	P												M			K		
	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○							○	○	○	○	○	○	○

HSS-PM MULTI-1 DRILLS

STUB CDRA03 SERIES

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc 30-45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

HSS PM | 30° | h6 | h7 | 118° | 135°

up to 1.9mm over 1.9mm

P. 2

Unit: mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03055	**5.50**	6	28	72
CDRA03955	**5.55**	6	28	72
CDRA03056	**5.60**	6	28	72
CDRA03956	**5.65**	6	28	72
CDRA03057	**5.70**	6	28	72
CDRA03957	**5.75**	6	28	72
CDRA03058	**5.80**	6	28	72
CDRA03958	**5.85**	6	28	72
CDRA03059	**5.90**	6	28	72
CDRA03959	**5.95**	6	28	72
CDRA03060	**6.00**	6	28	72
CDRA03061	**6.10**	8	31	75
CDRA03062	**6.20**	8	31	75
CDRA03063	**6.30**	8	31	75
CDRA03064	**6.40**	8	31	75
CDRA03065	**6.50**	8	31	75
CDRA03066	**6.60**	8	31	75
CDRA03067	**6.70**	8	31	75
CDRA03068	**6.80**	8	34	78
CDRA03069	**6.90**	8	34	78
CDRA03070	**7.00**	8	34	78
CDRA03071	**7.10**	8	34	78
CDRA03072	**7.20**	8	34	78
CDRA03073	**7.30**	8	34	78
CDRA03074	**7.40**	8	34	78
CDRA03075	**7.50**	8	34	78
CDRA03076	**7.60**	8	37	81
CDRA03077	**7.70**	8	37	81
CDRA03078	**7.80**	8	37	81
CDRA03079	**7.90**	8	37	81
CDRA03080	**8.00**	8	37	81
CDRA03081	**8.10**	10	37	87
CDRA03082	**8.20**	10	37	87
CDRA03083	**8.30**	10	37	87
CDRA03084	**8.40**	10	37	87
CDRA03085	**8.50**	10	37	87
CDRA03086	**8.60**	10	40	90
CDRA03087	**8.70**	10	40	90
CDRA03088	**8.80**	10	40	90
CDRA03089	**8.90**	10	40	90
CDRA03090	**9.00**	10	40	90
CDRA03091	**9.10**	10	40	90
CDRA03092	**9.20**	10	40	90
CDRA03093	**9.30**	10	40	90
CDRA03094	**9.40**	10	40	90
CDRA03095	**9.50**	10	40	90
CDRA03096	**9.60**	10	43	93
CDRA03097	**9.70**	10	43	93
CDRA03098	**9.80**	10	43	93
CDRA03099	**9.90**	10	43	93
CDRA03100	**10.00**	10	43	93
CDRA03101	**10.10**	12	43	100
CDRA03102	**10.20**	12	43	100
CDRA03103	**10.30**	12	43	100
CDRA03104	**10.40**	12	43	100
CDRA03105	**10.50**	12	43	100
CDRA03106	**10.60**	12	47	104
CDRA03107	**10.70**	12	47	104
CDRA03108	**10.80**	12	47	104
CDRA03109	**10.90**	12	47	104
CDRA03110	**11.00**	12	47	104
CDRA03111	**11.10**	12	47	104
CDRA03112	**11.20**	12	47	104
CDRA03113	**11.30**	12	47	104
CDRA03114	**11.40**	12	47	104
CDRA03115	**11.50**	12	47	104
CDRA03116	**11.60**	12	47	104
CDRA03117	**11.70**	12	47	104
CDRA03118	**11.80**	12	47	104
CDRA03119	**11.90**	12	51	108
CDRA03120	**12.00**	12	51	108
CDRA03121	**12.10**	12	51	108
CDRA03122	**12.20**	12	51	108
CDRA03123	**12.30**	12	51	108
CDRA03124	**12.40**	12	51	108
CDRA03125	**12.50**	12	51	108
CDRA03126	**12.60**	12	51	108
CDRA03127	**12.70**	12	51	108
CDRA03128	**12.80**	12	51	108
CDRA03129	**12.90**	12	51	108
CDRA03130	**13.00**	12	51	108

○ : Excellent ○ : Good

ISO Material Description	P												M			K		
	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○							○	○	○	○	○	○	○

HSS-PM MULTI-1 DRILLS

JOBBER CDRA04 SERIES

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc 30-45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

HSS PM | 30° | h6 | h7 | 135°

P. 2

Unit: mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA04020	2.0	3	24	56
CDRA04021	2.1	3	24	56
CDRA04022	2.2	3	25	56
CDRA04023	2.3	3	25	56
CDRA04024	2.4	3	30	61
CDRA04025	2.5	3	30	61
CDRA04026	2.6	3	30	61
CDRA04027	2.7	3	33	64
CDRA04028	2.8	3	33	64
CDRA04029	2.9	3	33	64
CDRA04030	3.0	3	33	64
CDRA04031	3.1	4	36	68
CDRA04032	3.2	4	36	68
CDRA04033	3.3	4	36	68
CDRA04034	3.4	4	39	71
CDRA04035	3.5	4	39	71
CDRA04036	3.6	4	39	71
CDRA04037	3.7	4	39	71
CDRA04038	3.8	4	43	75
CDRA04039	3.9	4	43	75
CDRA04040	4.0	4	43	75
CDRA04041	4.1	6	43	85
CDRA04042	4.2	6	43	85
CDRA04043	4.3	6	47	89
CDRA04044	4.4	6	47	89
CDRA04045	4.5	6	47	89
CDRA04046	4.6	6	47	89
CDRA04047	4.7	6	47	89
CDRA04048	4.8	6	52	94
CDRA04049	4.9	6	52	94
CDRA04050	5.0	6	52	94
CDRA04051	5.1	6	52	94
CDRA04052	5.2	6	52	94
CDRA04053	5.3	6	52	94
CDRA04054	5.4	6	57	99
CDRA04055	5.5	6	57	99
CDRA04056	5.6	6	57	99
CDRA04057	5.7	6	57	99
CDRA04058	5.8	6	57	99
CDRA04059	5.9	6	57	99
ZCDRA04060	6.0	6	57	99
CDRA04061	6.1	8	63	107
CDRA04062	6.2	8	63	107
CDRA04063	6.3	8	63	107
CDRA04064	6.4	8	63	107
CDRA04065	6.5	8	63	107
CDRA04066	6.6	8	63	107
CDRA04067	6.7	8	69	113
CDRA04068	6.8	8	69	113
CDRA04069	6.9	8	69	113
CDRA04070	7.0	8	69	113
CDRA04071	7.1	8	69	113
CDRA04072	7.2	8	69	113
CDRA04073	7.3	8	69	113
CDRA04074	7.4	8	69	113
CDRA04075	7.5	8	69	113
CDRA04076	7.6	8	75	119
CDRA04077	7.7	8	75	119
CDRA04078	7.8	8	75	119
CDRA04079	7.9	8	75	119

▶ NEXT PAGE

○ : Excellent ○ : Good

ISO Material Description	P												M			K		
	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ISO Material Description	N										S									
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys						Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○							○	○	○	○	○	○	○

HSS-PM MULTI-1 DRILLS

JOBBER CDRA04 SERIES

▶ **Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc 30-45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶ **Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

HSS PM | 30° | h6 | h7 | 135°

P. 2

Unit: mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA04080	8.0	8	75	119
CDRA04081	8.1	10	75	125
CDRA04082	8.2	10	75	125
CDRA04083	8.3	10	75	125
CDRA04084	8.4	10	75	125
CDRA04085	8.5	10	75	125
CDRA04086	8.6	10	81	131
CDRA04087	8.7	10	81	131
CDRA04088	8.8	10	81	131
CDRA04089	8.9	10	81	131
CDRA04090	9.0	10	81	131
CDRA04091	9.1	10	81	131
CDRA04092	9.2	10	81	131
CDRA04093	9.3	10	81	131
CDRA04094	9.4	10	81	131
CDRA04095	9.5	10	81	131
CDRA04096	9.6	10	87	137
CDRA04097	9.7	10	87	137
CDRA04098	9.8	10	87	137
CDRA04099	9.9	10	87	137
CDRA04100	10.0	10	87	137
CDRA04101	10.1	12	87	144
CDRA04102	10.2	12	87	144
CDRA04103	10.3	12	87	144
CDRA04104	10.4	12	87	144
CDRA04105	10.5	12	87	144
CDRA04106	10.6	12	87	144
CDRA04107	10.7	12	94	151
CDRA04108	10.8	12	94	151
CDRA04109	10.9	12	94	151
CDRA04110	11.0	12	94	151
CDRA04111	11.1	12	94	151
CDRA04112	11.2	12	94	151
CDRA04113	11.3	12	94	151
CDRA04114	11.4	12	94	151
CDRA04115	11.5	12	94	151
CDRA04116	11.6	12	94	151
CDRA04117	11.7	12	94	151
CDRA04118	11.8	12	94	151
CDRA04119	11.9	12	101	158
CDRA04120	12.0	12	101	158
CDRA04121	12.1	12	101	158
CDRA04122	12.2	12	101	158
CDRA04123	12.3	12	101	158
CDRA04124	12.4	12	101	158
CDRA04125	12.5	12	101	158
CDRA04126	12.6	12	101	158
CDRA04127	12.7	12	101	158
CDRA04128	12.8	12	101	158
CDRA04129	12.9	12	101	158
CDRA04130	13.0	12	101	158

○ : Excellent ○ : Good

ISO Material Description	P												M			K		
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HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	260	160	250	130	230	
Recommended	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

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HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○							○	○	○	○	○	○	○