

ZZ HARDMETAL

Successful Cooperation Commences Here

Tools for Rock and Soil Project

ZZ HARDMETAL

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Quality First,
Credit And Reputation First.



企业简介 INTRODUCTION

ZZ HARDMETAL - DRILL BRANCH was established in 2003 in Zhuzhou city. We are specialized at producing advanced rocking drilling tools, mining tools and road construction tools. And we have the ability to study, design, produce and trade as well as strong ability of technology innovation. We have been working and accumulating more than forty years' experience in the industry of cemented carbide rock drilling tools.

We use advanced quality cemented carbide material, specialized alloy steels, excellent mechanical processes, strict scientific heat treatment processes, top technology of thermal embedded, cold embedded, and brazing, perfect measurement and test methods, to supply our customers diversified and good rock drill tools, cemented carbide, mining tools and road construction tools.

Our main products include chisel bit, cross-type bit, steel drilling bit, button bit, down the hole bit, down the hole hammer, three-cone bit, bolting bit, engineering tools, road milling and planing cutter, cutting bit and cutting tools of shield, cemented carbide rock drill bits, and cemented carbide products etc. Our products are used in fields such as mining, rock drilling, tunneling, transportation, water conservancy, wells, construction, and exploration.

We export our products to over 20 countries such as America, France, Australia, Canada, South Africa, Malaysia, Brazil, England, and Korea. In addition, due to our excellent quality, we also supply our products to over 30 states and cities within China for long term.



目录 CONTENTS

锚固用套管钻具和锚杆钻头 Casing Bit& Bolting Bit	01
锥孔联接 (一字型, 十字形, 球齿钎头) Tapered Drill Bit (Cross Type Bit, Chisel Type Bit, Button Bit)	01
螺纹联接 (十字形, X型钎头, 球齿钎头) Threaded Drill Bit (Cross Type Bit, X Type Bit, Button Bit)	02
中高压潜孔钻头 DTH Bit	03
中高压潜孔冲击器 DTH Hammer	04
煤截齿 Cutting Tools	04-05
软岩刮削钻头 Soft Rock Bit&Scraper	06
农用犁头 Farm Machinery Parts	06
碎木刀具 Wood Chipper Cutters	07-08
工程刀具用片状合金 Cemented Carbide For Rock Tools	09
斗齿和平地铲 Engineering Teeth&Blade	09
钻具和截齿用柱齿合金 Cemented Carbide Button	10
盾构刀具 Shield Tunneling Tool	10
Guide To Product Codes	11-12
Drifting&Tunneling Equipment Rope Threaded 25RT(1")Series	13
Drifting&Tunneling Equipment Rope Thread 28RT(1 1/8")Series	14
Drifting&Tunneling Equipment Rope Thread 32RT(1 1/4")Series	15-16
Bench Drifting Equipment M Thread M38(1 1/2")Series	17
Bench Drifting Equipment M Thread M38(1 3/4")Series	18
Bench Drifting Equipment M Thread M51(2")Series	19
Reaming Equipment	20
Down The Hole Bit	21-23
BR&CIR系列冲击器 BR&CIR Hammer Series	24
CIR&DHD系列冲击器 CIR&DHD Hammer Series	24-26
中国矿用硬质合金常用牌号 The Frequently-Used Cemented Carbide Grade For Mining	27
引进的凿岩硬质合金牌号 Cemented Carbide Grade	28
国外硬质合金牌号简介 Brief Introduction of Carbide Grade Abroad	29
日本硬质合金牌号、化学成分及性能 Cemented Carbide Grade, Chemical Composition And Properties In Japan	30
美国硬质合金牌号、化学成分及性能 Cemented Carbide Grade, Chemical Composition And Properties In America	31-32
德国硬质合金牌号、化学成分及性能 Cemented Carbide Grade, Chemical Composition And Properties In Germany	33
英国硬质合金牌号、化学成分及性能 Cemented Carbide Grade, Chemical Composition And Properties In UK	34
俄罗斯硬质合金牌号、化学成分及性能 Cemented Carbide Grade, Chemical Composition And Properties In Russia	35
中外合金结构钢牌号近似对照表 Alloy Structural Steel Comparison Table Between China and Foreign Countries	36-39

锚固用套管钻具和锚杆钻头 CASING BIT& BOLTING BIT



锥孔联接 (一字型, 十字形, 球齿钎头) TAPERED DRILL BIT (CROSS TYPE BIT, CHISEL TYPE BIT, BUTTON BIT)



螺纹联接 (十字形, X型钎头, 球齿钎头)
THREADED DRILL BIT (CROSS TYPE BIT, X TYPE BIT, BUTTON BIT)



中高风压潜孔钻头
DTH BIT



中高风压潜孔冲击器
DTH HAMMER



煤截齿
CUTTING TOOLS



煤截齿
CUTTING TOOLS

截齿（采矿，工程用截齿）
Cutting Tools for Mining and Engineering



软岩刮削钻头
SOFT ROCK BIT&SCRAPER



碎木刀具
WOOD CHIPPER CUTTERS



农用犁头
FARM MACHINERY PARTS



碎木刀具
WOOD CHIPPER CUTTERS



工程刀具用片状合金
CEMENTED CARBIDE FOR ROCK TOOLS

- 1. 钎具用片状硬质合金 Cemented Carbide for Rock Drill Bit
- 2. 盾构刀具用硬质合金 Cemented Carbide for Shield Cutter



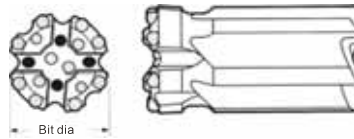
斗齿和平地铲
ENGINEERING TEETH & BLADE



GUIDE TO PRODUCT CODES

THREADED BIT(Bench)

45M P R 102 R 5



5=Drop Center (1=Flat face, 8=Convex)

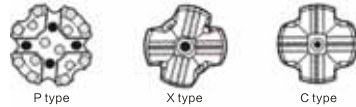


R=Round (BB=Ballistic, SA=Spike)

102=Bit dia 102mm(4") (64mm(2 1/2")-153mm(6"))

R=Retrac (J=Reverse blow, Blank= Straight Skirt)

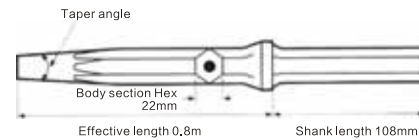
P=Button type (X=X-type, C=Cross type)



45M=45mm(1 3/4")M thread < 38M=38mm(1 1/2")M thread
51M=51mm(2")M thread

TAPERED ROD

T H 22 L 08 C



C=Taper angle 12° (A=6°)

08=Effective length 0.8m(2' 7")

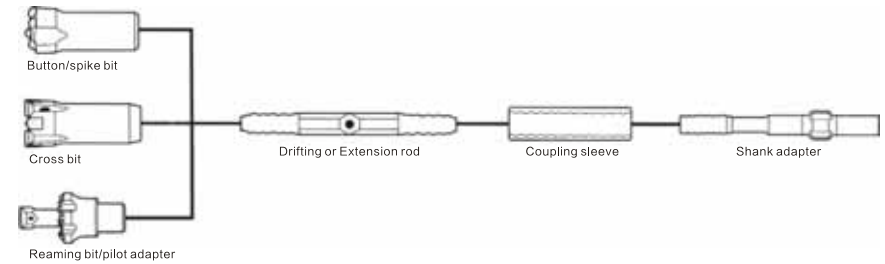
L=Shank length 108mm(LL=159mm)

22=Body section Hex 22mm(7/8")(25=25mm(1"))

H=Hexagonal hollow steel

T=Tapered rod

DRIFTING & TUNNELING EQUIPMENT ROPE THREADED 25RT(1") SERIES



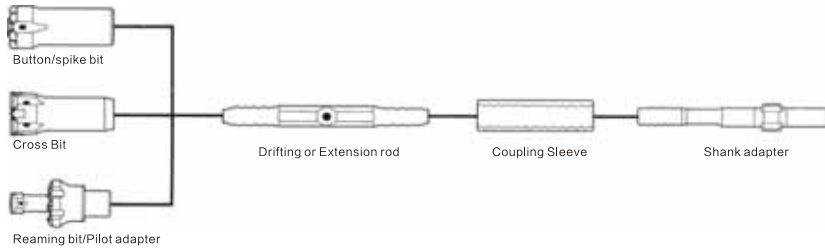
BIT	Carbide Shape	D		Part No	Approx. Weight	
		mm	in		Kg	lb
06 type	Round	35	1 3/8"	25RTP35R06	0.5	1.0
	Spike	35	1 3/8"	25RTP35SA06	0.5	1.0
	Round	38	1 1/2"	25RTP38R06	0.5	1.1
	Spike	38	1 1/2"	25RTP38SA06	0.5	1.1
	Round	41	1 5/8"	25RTP41R06	0.6	1.3
	Spike	41	1 5/8"	25RTP41SA06	0.6	1.3
Cross type		35	1 3/8"	25RTC35	0.4	0.9
		38	1 1/2"	25RTC38	0.5	1.1
		41	1 5/8"	25RTC41	0.6	1.3
		45	1 3/4"	25RTC45	0.7	1.6
		51	2"	25RTC51	0.9	2.0

DRIFTING ROD	H		L		Part No	Approx. Weight	
	mm	in	mm	ft/in		Kg	lb
	25	1"	2475	8'2"	EH25R32R25 -2475	10.2	22.7
			3090	10'2"			12.7
					EH25R32R25 -3090		

COUPLING SLEEVE	D		L		Part No	Approx. Weight	
	mm	in	mm	in		Kg	lb
	41	1 5/8"	160	6 1/4"	CR28 CR32	0.9	2.0
	45	1 3/4"	160	6 1/4"			1.1

ADAPTER COUPLING	D		L		Part No	Approx. Weight	
	mm	in	mm	in		Kg	lb
	40	1 37/64"	173	6 13/16"	CR28R25 CR32R25	0.9	2.0
	45	1 3/4"	170	6 57/64"			0.9

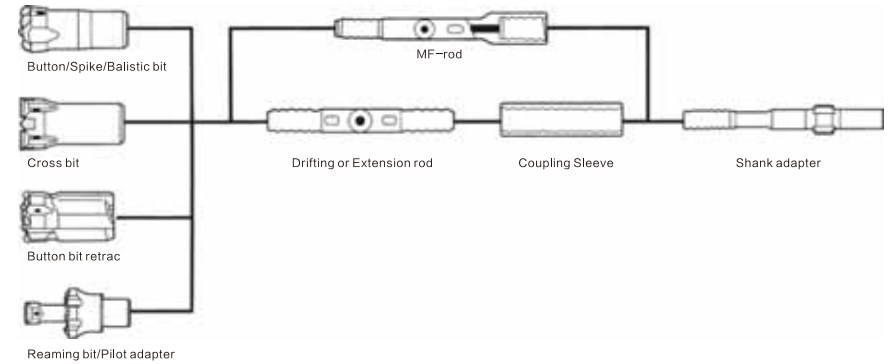
DRIFTING&TUNNELING EQUIPMENT ROPE THREAD 28RT(1 1/8")SERIES



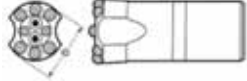

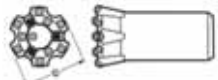


BIT	Carbide Shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
036 type 	Round	45	1 3/4"	28RTP45R036	0.7	1.6
06 type 	Round	38	1 1/2"	28RTP38R06	0.5	1.1
	Spike	38	1 1/2"	28RTP38SA06	0.5	1.1
	Round	41	1 5/8"	28RTP41R06	0.6	1.3
	Round	43	1 11/16"	28RTP43R06	0.7	1.6
	Round	45	1 3/4"	28RTP45R06	0.7	1.6
08 type 	Round	43	1 11/16"	28RTP43R08	0.7	1.6
	Round	45	1 3/4"	28RTP45R08	0.7	1.6
Cross type 		38	1 1/2"	28RTC38	0.5	1.1
		41	1 5/8"	28RTC41	0.6	1.3
		43	1 11/16"	28RTC43	0.7	1.6
		45	1 3/4"	28RTC45	0.7	1.6

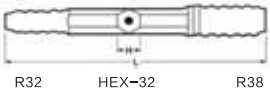
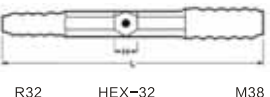
DRIFTING ROD	H		L		Part No	Approx.Weight	
	mm	in	mm	ft/in		Kg	lb
 R28 HEX-28 R32	28	1 1/8"	3090	10'2"	EH28R32R28-3090	15.8	35.0
			3700	12'2"		19.2	42.7
 R38 HEX-32 R38	32	1 1/4"	4310	14'2"	EH32R38 R28-4310	23.0	51.1

DRIFTING&TUNNELING EQUIPMENT ROPE THREAD 32RT(1 1/4")SERIES

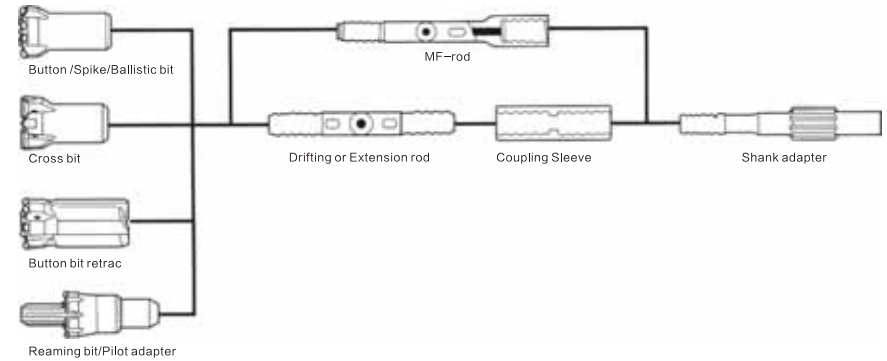



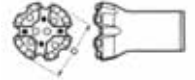


BIT	Carbide Shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
036 type 	Round	45	1 3/4"	32RTP45R036	0.8	1.7
	Spike	45	1 3/4"	32RTP45SA036	0.8	1.7
	Round	51	2"	32RTP51R036	1.0	2.2
	Spike	51	2"	32RTP51SA036	1.0	2.2
	Spike	57	2 1/4"	32RTP57SA036	1.2	2.7
036A type 	Round	45	1 3/4"	32RTP45R036	0.8	1.7
	Spike	51	2"	32RTP51SA036	1.0	2.2
06 type 	Spike	41	1 5/8"	32RTP41SA06	0.6	1.3
	Round	43	1 11/16"	32RTP43R06	0.6	1.3
	Round	45	1 3/4"	32RTP45R06	0.8	1.7
	Round	48	1 7/8"	32RTP48R06	0.9	1.9
	Round	51	2"	32RTP51R06	0.9	2.1
07 type 	Round	43	1 11/16"	32RTP43R07	0.6	1.3
	Round	45	1 3/4"	32RTP45R07	0.7	1.6
	Round	48	1 7/8"	32RTP48R07	0.8	1.8
	Round	51	2"	32RTP51R07	1.0	2.2

BIT	Carbide Shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
08 type 	Spike	45	1 3/4"	32RTP45SA08	0.8	1.7
	Ballistic	45	1 3/4"	32RTP45BB08	0.8	1.7
	Spike	48	1 7/8"	32RTP48SA08	0.9	2.0
	Ballistic	48	1 7/8"	32RTP48BB08	0.9	2.0
	Spike	51	2"	32RTP51SA08	0.9	2.1
Retrac flat face 	Round	51	2"	32RTPR51R1	2.2	4.9
	Round	57	2 1/4"	32RTPR57R1	2.7	6.0
	Round	64	2 1/2"	32RTPR64R1	2.8	6.2
Drop center 	Round	76	3"	32RTPR76R5	2.0	4.5
Cross type 		41	1 5/8"	32RTC41	0.6	1.3
		45	1 3/4"	32RTC45	0.7	1.6
		48	1 7/8"	32RTC48	0.9	2.0
		51	2"	32RTC51	0.9	2.1
		57	2 1/4"	32RTC57	1.1	2.4
X-type 		64	2 1/2"	32RTX64	1.3	2.9
		76	3"	32RTX76	1.5	3.3

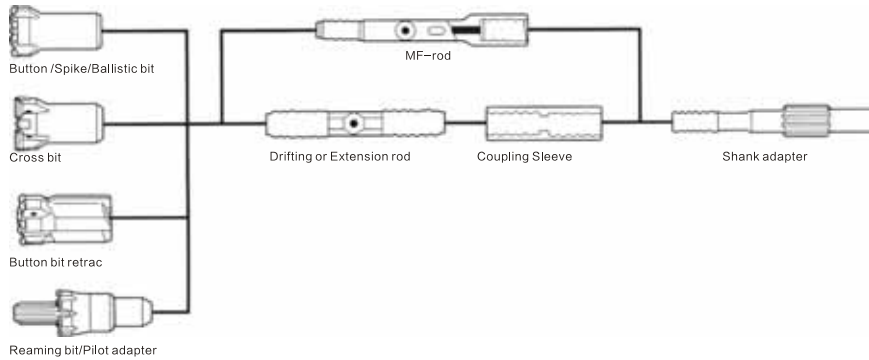
DRIFTING ROD	H		L		Part No	Approx.Weight	
	mm	In	mm	ft/in		Kg	lb
 R32 HEX-32 R38	32	1 1/4"	3090	10'2"	EH32R38R32-3090	19.7	43.8
			3700	12'2"	EH32R38R32-3700	23.4	52.1
			4310	14'2"	EH32R38R32-4310	27.2	60.5
			4920	16'2"	EH32R38R32-4920	31.3	69.5
 R32 HEX-32 M38	32	1 1/4"	3700	12'2"	EH32M38R32-3700	21.4	47.6
			4310	14'2"	EH32M38R32-4310	27.1	60.2
			4920	16'2"	EH32M38R32-4920	31.3	69.5

BENCH DRILLING EQUIPMENT M THREAD M38(1 1/2")SERIES

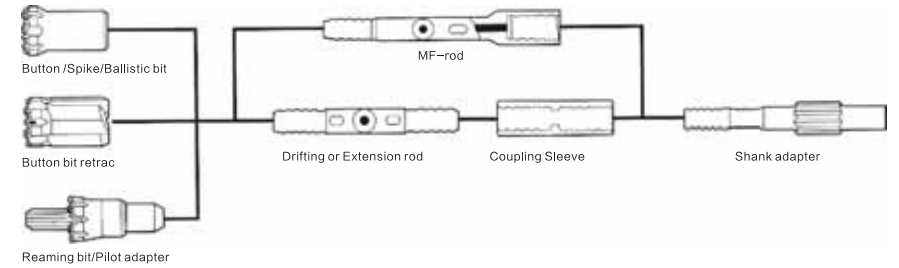


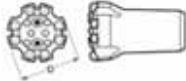

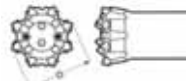

BIT	Carbide Shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
Flat face 	Round	64	2 1/2"	38MP64R1	1.7	3.9
	Round	70	2 3/4"	38MP70R1	1.9	4.5
	Round	76	3"	38MP76R1	2.5	5.6
	Round	89	3 1/2"	38MP89R1	3.7	8.2
	Round	102	4"	38MP102R1	4.5	10.0
Drop center 	Round	64	2 1/2"	38MP64R5	1.7	3.7
	Spike	64	2 1/2"	38MP64SA5	1.7	3.7
	Ballistic	64	2 1/2"	38MP64BB5	1.7	3.7
	Round	70	2 3/4"	38MP70R5	1.8	4.1
	Ballistic	70	2 3/4"	38MP70BB5	1.8	4.1
	Round	76	3"	38MP76R5	2.3	5.2
	Ballistic	76	3"	38MP76BB5	2.3	5.2
	Round	89	3 1/2"	38MP89R5	3.4	7.5
	Spike	89	3 1/2"	38MP89SA5	3.4	7.5
	Ballistic	89	3 1/2"	38MP89BB5	3.4	7.5
	Round	102	4"	38MP102R5	4.6	10.2
	Spike	102	4"	38MP102SA5	4.6	10.2
Convex 	Spike	64	2 1/2"	38MP64SA8	1.6	3.6
	Spike	76	3"	38MP76SA8	2.4	5.3
	Spike	89	3 1/2"	38MP89SA8	3.5	7.7
Retrac button bit 	Round	64	2 1/2"	38MPR64R	2.6	5.8
	Round	76	3"	38MPR76R	4.0	8.9
	Round	89	3 1/2"	38MPR89R	5.5	12.2
	Round	102	4"	38MPR102R	7.0	15.6

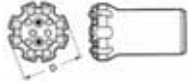



BENCH DRILLING EQUIPMENT M THREAD M45(1 3/4")SERIES



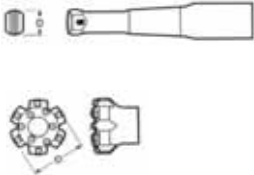
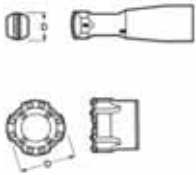
BENCH DRILLING EQUIPMENT M THREAD M51(2")SERIES



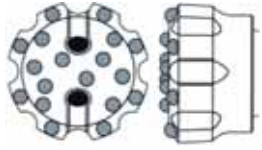
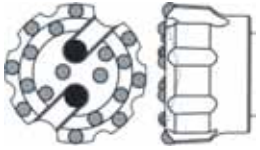
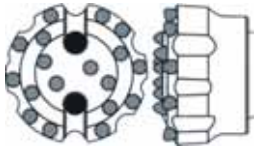
BIT	Carbide shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
Flat face 	Round	76	3"	45MP76R1	2.6	5.8
	Round	89	3 1/2"	45MP89R1	4.1	9.2
	Round	102	4"	45MP102R1	4.5	10.0
	Round	115	4 1/2"	45MP115R1	5.9	13.0
Drop center 	Round	70	2 3/4"	45MP70R5	2.0	4.4
	Ballistic	70	2 3/4"	45MP70BB5	2.0	4.4
	Round	76	3"	45MP76R5	2.4	5.3
	Spike	76	3"	45MP76SA5	2.4	5.3
	Ballistic	76	3"	45MP76BB5	2.4	5.3
	Round	89	3 1/2"	45MP89R5	3.8	8.4
	Spike	89	3 1/2"	45MP89SA5	3.8	8.4
	Ballistic	89	3 1/2"	45MP89BB5	3.8	8.4
	Round	102	4"	45MP102R5	4.5	9.9
	Spike	102	4"	45MP102SA5	4.5	9.9
	Ballistic	102	4"	45MP102BB5	4.5	9.9
	Round	115	4 1/2"	45MP115R5	6.6	14.7
Round	127	5"	45MP127R5	8.4	18.6	
Convex 	Spike	76	3"	45MP76SA8	2.4	5.4
	Ballistic	76	3"	45MP76BB8	2.4	5.4
	Spike	89	3 1/2"	45MP89SA8	3.9	8.7
	Ballistic	89	3 1/2"	45MP89BB8	3.9	8.7
Retrac button bit 	Round	76	3"	45MPR76R	4.0	8.9
	Round	89	3 1/2"	45MPR89R	5.5	12.2
	Round	102	4"	45MPR102R	7.8	17.3
	Round	115	4 1/2"	45MPR115R	9.2	20.4

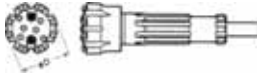

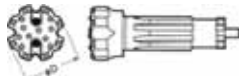

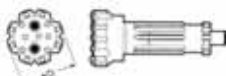
BIT	Carbide shape	D		Part No	Approx.Weight	
		mm	in		Kg	lb
Flat Face 	Round	89	3 1/2"	51MP89R1	4.5	10.0
	Round	102	4"	51MP102R1	5.6	12.5
	Round	115	4 1/2"	51MP115R1	7.6	16.8
	Round	127	5"	51MP127R1	9.7	21.6
Drop Center 	Round	89	3 1/2"	51MP89R5	4.1	9.0
	Round	102	4"	51MP102R5	5.3	11.8
	Spike	102	4"	51MP102SA5	5.3	11.8
	Ballistic	102	4"	51MP102BB5	5.3	11.8
	Round	115	4 1/2"	51MP115R5	7.1	15.7
	Ballistic	115	4 1/2"	51MP115BB5	7.1	15.7
	Round	127	5"	51MP127R5	9.2	20.4
	Ballistic	127	5"	51MP127BB5	9.2	20.4
Round	140	5 1/2"	51MP140R5	11.0	24.4	
Convex 	Round	102	4"	51MP102R8	7.7	17.1
	Spike	102	4"	51MP102SA8	7.7	17.1
	Spike	115	4 1/2"	51MP115SA8	8.5	18.9
	Spike	127	5"	51MP127SA8	9.4	20.9
	Round	127	5"	51MP127R8	9.4	20.9
Retrac button bit 	Round	89	3 1/2"	51MPR89R	5.9	13.1
	Round	102	4"	51MPR102R	8.0	17.8
	Round	115	4 1/2"	51MPR115R	9.8	21.8
	Round	127	5"	51MPR127R	11.7	26.0

REAMING EQUIPMENT






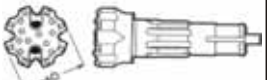
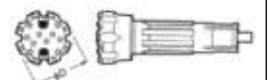
REAMING BIT/PILOT ADAPTER	Type	Thread	D		Part No	Approx. Weight	
			mm	in		Kg	Lb
6 Taper 	TH	25RT	26	1 1/32"	WR25THI26B	1.4	3.0
		28RT	26	1 1/32"	WR28THI26B	1.4	3.0
		32RT	26	1 1/32"	WR32THI26B	1.4	3.0
		64	2 1/2"	WTHP64R	1.0	2.2	
		76	3"	WTHP76R	1.1	2.4	
		89	4"	WTHP89R	1.5	3.4	
12 Taper 	TK	28RT	35	1 3/8"	WR28TKI35B	1.9	4.2
		32RT	40	1 37/64"	WR32TKI40B	2.2	4.9
		89	3 1/2"	WTKP89R	1.7	3.8	
		102	4"	WTKP102R	2.0	4.4	
		127	5"	WTKP127R	6.1	13.6	
		With Thread Stopper	TF	32RT	47	1 7/8"	WR32TFG47
M38	47	1 7/8"		WM38TFG47	2.8	6.2	
102	4"	WTFP102R		2.0	4.4		
115	4 1/4"	WTFP115		3.7	8.2		
127	5"	WTFP127R		5.2	11.5		

DOWN THE HOLE BIT

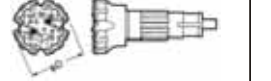
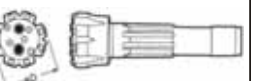
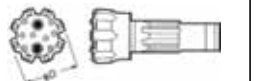
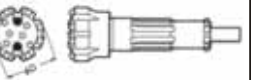


		
Flat Face Design (R2)	Concave Design (R6)	Convex Design (BB8)
For drilling in a medium-hard to hard and abrasive rock.	The all-round application bit specifically designed for medium hard and homogeneous rock formations. Excellent hole deviation control and flushing volume.	Bit design with excellent flushing volume. For drilling at high penetration rates in non-abrasive rock.

DOWN THE HOLE BIT	Hammer Model	Design	Gauge Dia		Weight
			mm	in	kg
	Ingersoll-Rand DHD3.5	R2 BB8	90	3 1/2"	4.7
			95	3 3/4"	4.8
			100	3 15/16"	4.9
			102	4"	4.9
	Ingersoll-Rand DHD340	R2 BB8	105	4 1/8"	8.6
			110	4 5/16"	8.7
			115	4 1/2"	9.0
			120	4 3/4"	9.7
			127	5"	10.6
	Ingersoll-Rand DHD350	R2 BB8	133	5 1/4"	16.0
			140	5 1/2"	16.4
			146	5 3/4"	16.8
			152	6"	18.1
	Ingersoll-Rand DHD360	R6	152	6"	24.0
			156	6 1/8"	24.4
			159	6 1/4"	24.6
			165	6 1/2"	24.8
			171	6 3/4"	25.4
			178	7"	26.1
			191	7 1/2"	26.6
			*200	* 7 7/8"	29.5
			*203	*8"	29.9
			*216	*8 1/2"	35.0
	Ingersoll-Rand DHD380	R6	203	8"	49.5
			216	8 1/2"	52.7
			230	9"	53.3
			*254	*10"	54.0

*No shank breakage warranty

DOWN THE HOLE BIT	Hammer Model	Design	Gauge Dia		Weight
			mm	in	kg
	Ingersoll-Rand QL40	R2 BB8	105	4 1/8"	8.6
			110	4 5/16"	8.7
			115	4 1/2"	9.0
			120	4 3/4"	9.7
			127	5"	10.6
	Ingersoll-Rand QL50	R2 BB8	133	5 1/4"	16.0
			140	5 1/2"	16.4
			146	5 3/4"	16.8
			152	6"	18.1
	Ingersoll-Rand QL60	R6	152	6"	24.0
			156	6 1/8"	24.4
			159	6 1/4"	24.6
			165	6 1/2"	24.8
			171	6 3/4"	25.4
			178	7"	26.1
			191	7 1/2"	26.6
			*200	*7 7/8"	29.5
			*203	*8"	29.9
			*216	*8 1/2"	35.0
	Ingersoll-Rand QL80	R6	203	8"	49.5
			216	8 1/2"	52.7
			230	9"	53.3
			*254	*10"	54.0
	Sandvik Mission SD4	R2 BB8	105	4 1/8"	8.6
			110	4 5/16"	8.7
			115	4 1/2"	9.0
			120	4 3/4"	9.7
			127	5"	10.6
	Sandvik Mission SD5	R2 BB8	133	5 1/4"	16.0
			140	5 1/2"	16.4
			146	5 3/4"	16.8
			152	6"	18.1
	Sandvik Mission SD6	R6	152	6"	24.0
			156	6 1/8"	24.4
			159	6 1/4"	24.6
			165	6 1/2"	24.8
			171	6 3/4"	25.4
			178	7"	26.1
			191	7 1/2"	26.6
			*200	*7 7/8"	29.5
			*203	*8"	29.9
			*216	8 1/2"	35.0

*No shank breakage warranty

DOWN THE HOLE BIT	Hammer Model	Design	Gauge Dia		Weight
			mm	in	kg
	Sandvik Mission SD8	R6	203	8"	49.5
			216	8 1/2"	52.7
			230	9"	53.3
			*254	*10"	54.0
	Atlas Copco COP32	R2 BB8	90	3 1/2"	4.7
			95	3 3/4"	4.8
			100	3 15/16"	4.9
			102	4"	4.9
	Atlas Copco COP42	R2 BB8	105	4 1/8"	8.6
			110	4 5/16"	8.7
			115	4 1/2"	9.0
			120	4 3/4"	9.7
			127	5"	10.6
	HALCO MACH33	R2 BB8	90	3 1/2"	4.7
			95	3 3/4"	4.8
			100	3 15/16"	4.9
			102	4"	4.9
	HALCO MACH44	R2 BB8	105	4 1/8"	8.6
			110	4 5/16"	8.7
			115	4 1/2"	9.0
			120	4 3/4"	9.7
			127	5"	10.6
	HALCO MACH50	R2 BB8	133	5 1/4"	16.0
			140	5 1/2"	16.4
			146	5 3/4"	16.8
			152	6"	18.1

*No shank breakage warranty

BR&CIR系列冲击器 BR&CIR Hammer Series

型号 Type	YTBR1	YTBR2	YTBR3	YTCIR90	YTCIR110	YTCIR150
钻孔直径(mm) Drilling Dia.	64-76	70-90	90-110	85-110	110-135	155-178
外套直径(mm) External Case Dia.	54	62	82	80	98	136.5
总长(mm) Overall Length	760	880	889	800	839	908
总重(kg) Total Weight	11.7	17	30	22	36.7	85
工作压力(Mpa) Working Air Pressure	0.7-1.75	0.7-1.75	0.7-1.75	0.5-0.7	0.5-0.7	0.5-0.7
耗风量(m ³ /min) Air Consumption	2.5	1	6	7.2	12	15.9
与钻杆联接方式 Connection Thread	RD40 BOX	RD50 BOX	API 2 3/8"	外T48x10x2	内API 2 3/8"	内T75x10x2.5
配用钎头 Bit Shank	BR1	BR2	BR3	CIR90	CIR110	CIR150

CIR&DHD系列冲击器 CIR&DHD Hammer Series

型号 Type	YTSD4	YTSD5	YTSD6	YTSD8	YTSD10	YTD3.5
钻孔直径(mm) Drilling Dia.	110-135	135-155	155-190	195-254	254-311	90-110
外套直径(mm) External Case Dia.	99	125	142	180	226	82
总长(mm) Overall Length	1084	1175	1261	1463	1502	930
总重(kg) Total Weight	50	88	125.8	229	405	30
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-1.5
耗风量(m ³ /min) Air Consumption	6.0-15.0	9.0-23.0	10.0-28.5	15.0-34.0	22.0-55.0	4.5-9.0
配用钎头 Bit Shank	SD4	SD5	SD6	SD8	SD10	DHD3.5
与钻杆联接方式 Connection Thread	API 2 3/8"	API 3 1/2"	API 3 1/2"	API 4 1/2"	API 4 1/2" API 6 5/8"	API 2 3/8"

型号 Type	YTD45	YTD55A	YTD75A	YTD85A	YTD55S
钻孔直径(mm) Drilling Dia.	110-135	135-155	175-216	195-254	127-145
外套直径(mm) External Case Dia.	99	125	165	180	116
总长(mm) Overall Length	1030	1110	1258	1359	1110
总重(kg) Total Weight	48	85	148.5	215	81.5
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	6.0-15.0	7.0-19.0	11.0-28.0	12.0-28.0	7.0-18.0
配用钎头 Bit Shank	COP44,DHD340	COP54,DHD350R	COP64, DHD360	COP84, DHD380	COP54,DHD350R
与钻杆联接方式 Connection Thread	API 2 3/8"	API 2 3/8";API 3 1/2"	API 3 1/2"	API 4 1/2"	API 2 3/8";API 3 1/2"

型号 Type	YTD55C(A)	YTD55	YTD65A	YTD55C	YTQL5
钻孔直径(mm) Drilling Dia.	135-155	135-155	155-203	135-155	135-155
外套直径(mm) External Case Dia.	125	125	142	125	125
总长(mm) Overall Length	1102	1214	1238	1160	1156
总重(kg) Total Weight	84	92.5	124	88	88.5
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	8.0-19.0	9.0-23.0	9.0-26.0	9.0-23.0	9.0-23.0
配用钎头 Bit Shank	HD55C,DHD350Q	COP54 DHD350R	COP64, DHD360	HD55C DHD350Q	QL50
与钻杆联接方式 Connection Thread	API 2 3/8";API 3 1/2"	API 2 3/8";API 3 1/2"	API 3 1/2"	API 2 3/8";API 3 1/2"	API 3 1/2"

型号 Type	YTQL5A	YTQL80	YTN100	YTD1120	YTSD5A
钻孔直径(mm) Drilling Dia.	135-155	195-254	254-311	305-445	135-155
外套直径(mm) External Case Dia.	125	180	226	275	125
总长(mm) Overall Length	1090	1465	1510	1900	1090
总重(kg) Total Weight	83	215	403	600	86
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	7.0-19.0	15.0-34.0	22.0-60.0	30.0-78.0	7.0-19.0
配用钎头 Bit Shank	QL50	QL80	NUMA100	DHD1120	SD5
与钻杆联接方式 Connection Thread	API 2 3/8";API 3 1/2"	API 4 1/2"	API 6 5/8"	API 6 5/8"	API 2 3/8";API 3 1/2"

型号 Type	YTSD6A	YTSD8A	YTSD12	YTN120	YTN125
钻孔直径(mm) Drilling Dia.	155-203	195-254	305-445	305-445	305-445
外套直径(mm) External Case Dia.	146	180	275	275	275
总长(mm) Overall Length	1182	1330	1880	1900	1900
总重(kg) Total Weight	117	211	607	605	655
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.2-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	9.0-26.0	12.0-28.0	30.0-78.0	30.0-78.0	30.0-78.0
配用钎头 Bit Shank	SD6	SD8	SD12	NUMA120	NUMA125
与钻杆联接方式 Connection Thread	API 3 1/2"	API 4 1/2"	API 6 5/8"	API 6 5/8"	API 6 5/8"

型号 Type	YTD65	YTHM5A	YTHM8A	YTHM6A	YTD85
钻孔直径(mm) Drilling Dia.	155-190	135-155	195-254	155-203	195-254
外套直径(mm) External Case Dia.	142	125	180	146	180
总长(mm) Overall Length	1248	1110	1338	1161	1492
总重(kg) Total Weight	126	82	207	113	228
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	10.0-28.5	7.0-19.0	12.0-28.0	9.0-26.0	15.0-34.0
配用钎头 Bit Shank	COP64,DHD360	HM5	HM8	HM6	COP84 DHD380
与钻杆联接方式 Connection Thread	API 3 1/2"	API 2 3/8";API 3 1/2"	API 4 1/2"	API 3 1/2"	API 4 1/2"

型号 Type	YTQL60	YTQL6A	YTQL8A	YTQL40
钻孔直径(mm) Drilling Dia.	155-190	155-203	195-254	110-135
外套直径(mm) External Case Dia.	146	146	180	99
总长(mm) Overall Length	1212	1183	1330	1097
总重(kg) Total Weight	119.6	117	206	50.5
工作压力(Mpa) Working Air Pressure	1.0-2.5	1.0-2.5	1.0-2.5	1.0-2.5
耗风量(m ³ /min) Air Consumption	10.0-28.5	9.0-26.0	12.0-28.0	6.0-15.0
配用钎头 Bit Shank	QL60	QL60	QL80	QL40
与钻杆联接方式 Connection Thread	API 3 1/2"	API 3 1/2"	API 4 1/2"	API 2 3/8"

中国矿用硬质合金常用牌号

The Frequently-Used Cemented Carbide Grade for Mining

矿山地质工具用硬质合金牌号、性能及推荐用途Cemented Carbide Grade, Properties and Usages for Mining Geological Tools

牌号 Grade	物理机械性能 Physical and Mechanical Properties				推荐用途 Suggested Usage
	中国 牌号 China	山特维克 Sandvik	密度 Density g/cm ³	硬度 HRA	
YG4C	YG4C	14.9-15.3	≥89.5	≥1620	适于地质勘探钻具、煤田采掘用轻型电钻齿，作软岩层，煤层及无硅化岩层钻进钻具。 It is suitable for making geological prospecting drill bits and mining inserts for light electrical drills for drilling soft rock and coal formations and drill bits for drilling un-silicated rock formations.
YG6	YG6	14.7-15.1	≥89.5	≥1670	
YG8	YG8	14.6-14.9	≥89	≥1840	
YG8C	YG8C	14.5-14.9	≥87.5	≥2260	主要用作合金柱齿，镶制牙轮钻和冲击钻具，钻进硬岩层和坚硬岩层，同时也可作其他钻具用合金片。 It is mainly used for making buttons and tricone and percussive drill bits for drilling hard and super hard rock for formations and it can also be used for making inserts in other drill bits.
YG11C		14.1-14.5	≥86.5	≥2000	
YG15		13.9-14.2	≥86.5	≥2220	强度高，耐磨性较低，适用于冲击回转凿岩机械和重型转磨机用的钎头；钻进坚硬和极坚硬岩层。 High intensity, lower wear-resistance. Suitable for making bits used in rotary machine and heavy rotary machine to drill hard and very hard rock formation.
YK15		14.5-14.8	≥87	≥2030	适于镶制轻型凿岩机用冲击回转凿岩钎头，钻进F=14级以下的中等偏软硬度的岩层。 Suitable for embedding rotary percussive drill bits of light rock drilling machines for drilling soft to medium rock formations of class f=14-16
YK15.6		14.45-14.75	≥86.5	≥2300	适于矿山采掘用重型凿岩机钻具用钎片，钻进硬岩层和坚硬岩层，亦可作牙轮钻等柱齿钻具。 It is suitable for inserts for heavy duty rock excavating machines for drilling hard and super hard rock for formations and it can also be used for making tricone button bits.
YK20	YK1	14.3-14.6	≥86	≥2460	
YK25	YK105	14.3-14.7	≥86.5	≥2550	合金具有优良的韧性和相应的耐磨性，用于矿山采掘，重型凿岩机钻具用钎片，潜孔钻具片等钻进硬岩层和坚硬岩层，也可作其他柱齿钻具用合金齿。 With super toughness and corresponding wear resistance, it is suitable for mining inserts in mine prospecting, in heavy duty rock drilling machines and depth drilling bits for drilling hard and super hard rock formations and it can also be used for other button bits.
YK45	YG15矿	13.9-14.2	≥85.5	≥2200	
YK50	YG15C	13.9-14.2	≥85	≥2350	主要用作合金球齿，镶制牙轮钻和柱齿冲击钻具，钻进中硬和硬岩层，同时也可作其他钻具用合金片。 It is mainly used for buttons to be used in tricone drill bits and percussive buttons bits for drilling medium hard and hard rock formations and it also can be used for cemented carbide inserts for other drilling bits.
YK40	YG13C	14.00-14.40	≥85.5	≥2200	
YRK10	YK44	≥14.4	≥88	≥2200	

引进的凿岩硬质合金牌号 Cemented Carbide Grade

牌号 Grade		物理机械性能 Physical and Mechanical Properties			推荐用途 Suggested Usage
中国 牌号 China	山特维克 SANDVIK	密度 Density g/cm ³	硬度HRA	抗弯强度 Bending Strength N/mm ²	
YK05	40	14.8-14.96	90.1	2600	主要用作小规格的冲击器钻的球齿，适于软岩层、中硬岩层。 Mainly used as small buttons for percussion bits to cut soft and medium-hard formations.
YK10	38	14.6-14.76	88.8	2500	主要用于作中、小规格冲击钻的球齿，旋转勘探钻具合金片、适于软岩层、中硬岩层。 Mostly used as the buttons of small and medium-sized percussion bits and as the inserts of rotary prospecting bits to cut soft and medium-hard formations.
YK20.1	42	14.44-14.6	88.5	2900	主要用作冲击回转钻具的球齿、钎片，适用中硬岩层和硬岩层。 Primarily for the buttons and inserts of rotary percussion bits to cut medium-hard and hard formations.
YK25.1	702	14.4-14.56	88.2	2800	主要用作牙轮钻具球齿。 Chiefly for the buttons of tricone bits
YK30	11	14.32-14.46	87.7	2600	主要用作冲击器、牙轮钎具的钎片、球齿，用于中硬岩石、硬岩石以及坚硬岩石 Largely for the inserts and buttons of percussion bits and tricone bits to cut medium-hard and very hard formations.
Yk35	CB08	13.89-14.11	86.5	2600	主要用作牙轮钻球齿、冲击回转钎片、用于硬岩层、坚硬岩层。 Predominantly for the buttons of tricone bits and inserts of rotary percussion bits to cut hard and very hard formations.

国外硬质合金牌号简介

Brief Introduction of Carbide Grade Abroad

国际标准化组织 (ISO) 硬质合金牌号、化学成分及性能
(ISO) Carbide Grade, Chemical Composition and Properties

英国BHMA标准硬质合金的化学成分及性能 BHMA Standard Carbide Chemical Composition and Properties									
合金分类 Carbide Classification	合金牌号 Carbide Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)			密度 Density /g.cm ⁻³	维氏硬度 HV	抗弯强度 Bending Strength Obb/Mpa	抗弯强度 Bending Strength Obc/Mpa	近似的中国牌号 Similar Chinese Grade
		WC	TaC+TiC	Co					
P	P01.2	30	64	6	7.2	1800	750	3500	YT30
	P01.3	51	43	6	8.5	1750	900	4200	YT05
	P01.4	62	33	5	10.1	1750	1000	-	
	P05	77	18	5	12.2	1700	1100	4300	
	P10	63	28	9	10.7	1600	1300	4600	YT15
	P20	76	14	10	11.9	1500	1500	4800	YT14
	P25	74	20	9	12.4	1450	1750	4800	
	P30	82	8	10	13.1	1450	1750	5000	YT5
M	P40	75	12	13	12.7	1400	1950	4900	
	P50	68	15	17	12.5	1300	2200	4000	
	M10	84	10	6	13.1	1700	1350	5000	YW1
	M20	82	10	8	13.4	1550	1600	5000	YW2
K	M30	81	10	9	14.4	1450	1800	4800	
	M40	79	6	15	13.6	1300	2100	4400	
	K01	92	4 ^①	4	15	1800	1200	-	YG3X
	K05	91	3 ^①	6	14.5	1750	1350	5900	YG6,TG6X
	K10	92	2 ^①	6	14.8	1650	1500	5700	YG6A
G	K20	92	2	6	14.8	1550	1700	5000	YG8N
	K30	89	2	9	14.4	1400	1900	4700	YG8
	K40	88	-	12	14.3	1300	2100	4500	YG10H ^②
	G05	94	-	6	14.8	1600	1500	-	YG6X
	G10	94	-	6	14.8	1550	1600	-	YG6
	G15	91	-	9	14.5	1450	1900	-	YG8
	G20	88	-	12	14	1300	2100	-	YG11C(YG11)
	G30	85	-	15	13.8	1200	2400	-	YG15
G	G40	80	-	20	13.5	1100	2600	-	YG20
	G50	75	-	25	13.1	1000	2700	-	YG25 ^②
	G60	70	-	30	12.8	900	2800	-	YG30 ^②

①TaC合金 ②新牌号合金

1 TaC Cemented Carbide 2 New Grade Carbide

日本硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In Japan

用途分类 Application Classification	分类牌号 Grade	金属成分 (质量分数) (%) Co	硬质相成分 (质量分数) (%) Hard Phase Composition (Mass Fraction)	硬质相中的 Ti,Ta(Nb)	硬度 Hardness ≥HRA	抗弯强度 Bending Strength ≥/Mpa
		W为基体的硬质相 Hard Phase At W as Matrix				
切削工具 用硬质合金 Cemented Carbide For Cutting Tools	P01	4~8	92~96	20~50	91.5	686
	P10	4~10	90~96	20~40	91	883
	P20	5~10	90~95	10~30	90	1079
	P30	7~12	88~93	5~25	89	1275
	P40	7~5	85~93	2~20	88	1471
	M10	4~9	91~96	1~15	91	981
	M20	5~11	89~95	2~20	90	1079
	M30	7~12	88~93	1~15	89	1275
	M40	8~20	80~92	1~3	87	1569
	K01	3~6	94~97	0~5	91.5	981
	K10	4~7	93~96	0~3	90.5	1177
	K20	5~8	92~95	0~3	89	1375
	K30	6~11	89~94	0~3	88	1471
拉丝模和顶尖 工具用硬质合金 Cemented Carbide For Drawing Die and Tools	V10	3~6	94~97	-	89	1177
	V20	5~10	90~95	-	88	1275
	V30	8~16	84~92	-	87	1471
矿山和地质 工具用硬质合金 ^① Cemented Carbide For Mining and Geological Tools	E1	~	92~96	-	90	1177
	E2	~	90~95	-	89	1375
	E3	~	90~93	-	88	1569
	E4	~	87~92	-	87	1667
	E5	~	83~91	-	86	1961
超微粒硬质合金 Micro Cemented Carbide	Z01	3~12	88~97	0~5 ^②	92	1177
	Z10	5~15	85~95	0~3 ^②	91	1275
	Z20	7~17	83~93	0~3 ^②	89.5	1471
	Z30	10~25	75~90	0~3 ^②	89.5	1668

①摘自日本JIS B4053“硬质合金标准”

Extracted from Japan JIS B4053“Cemented carbide standard”

②摘自JIS M3916-83.

Extracted from JIS M3946-83

③硬质相中Ti,Ta,V,Cr的成分

Ti,Ta,V,Cr compositions in hard phase

美国硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In America

统一牌号 Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)						物理-力学性能 Physical Properties				用途举例 Usage Examples
	W	Ti	Ta	Nb	C	Co	密度 Density /g.cm ⁻³	硬度 (HRA)	Obb/ Mpa	晶粒尺寸 Particle Size /um	
W-Co类硬质合金											
CQ-1	88.25	-	-	-	5.75	6.0	14.95	>91.2	1260~1930	3	用于铸铁和非铁材料粗加工, 亦可用作耐磨材料
CQ-2	88.25	-	-	-	5.75	6.0	14.95	91.8	1260~1830	1~2	用于铸铁、非铁材料及不锈钢的一般加工
CQ-3	89.66	-	-	-	5.84	4.5	14.05	92.2	980~1760	1~2	用于铸铁和非铁材料及精加工
CQ-4	91.06	-	-	-	5.94	3.0	15.15	92.8	880~1580	3~2	用于铸铁和非铁材料的精磨
CQ-5	85.43	-	-	-	5.57	9.0	14.60	90.3	1930	1	用于对刀具初度要求高的铸铁加工, 亦可作耐磨材料
CQ-6	81.68	-	-	-	5.32	13.0	14.25	88.0	2111	4~3	主要用作耐磨材料与量具
CQ-7	85.43	-	-	-	5.57	9.0	14.55	89.5	1760~2460	2~4	用于冲击很小或没有冲击的耐磨零件
CQ-8	76.98	-	-	-	5.02	18.0	13.65	87.5	2390	1~3	用于猛烈振动条件下的耐磨材料 (也可用于中等冲击条件下使用)
CQ-9	70.41	-	-	-	4.59	25.0	13.25	85.5	2110~3160	2~3	在冲击极剧烈的条件下使用
CQ-10	78.86	-	-	-	5.14	16.0	13.85	86.0	2110~2990	2~3和8	用于承受剧烈振动的摩擦表面 (也可用于中等冲击条件)
CQ-11	82.61	-	-	-	5.39	12.0	14.30	86.5	1970~2640	3~5和7	用于振动条件下的耐磨零件
CQ-12	87.31	-	-	-	5.69	7.0	14.89	91.0	1690	2~4	用于粗加工铸铁和非铁材料
CQ-13	75.10	-	-	-	4.90	20.0	13.60	86.0	2670	2~4	用于剧烈振动与中等冲击条件下的耐磨零件
CQ-14	83.55	-	-	-	5.45	11.0	14.28	89.3	2110	2~3	用于中等、剧烈振动与中等冲击条件下的耐磨零件
CQ-15	79.80	-	-	-	5.20	15.0	14.00	88.0	2740	1~2	在中等及剧烈的冲击条件下使用
W-Ta-Nb-Co类硬质合金											
CU-1	80.7	-	1.4	0.6	5.4	11.9	14.10	90.0	2280	1~3	可在重载下切削合金或铸铁、奥氏体不锈钢, 也可用于低速切削钢
CU-2	86.3	-	1.8	0.3	5.8	5.8	14.80	92.0	1760	2~3	可用于铸铁、非铁材料及非铁材料的粗加工与半精加工
CU-3	65.7	-	3.1	1.5	4.7	25.0	12.80	85.0	2530	1~3	可用于制造承受强烈冲击的模具
CU-4	71.7	-	2.7	0.9	4.7	20.0	13.40	86.5	2670	1~3	可用于制造承受中等与强烈冲击的模具
CU-5	77.0	-	1.5	0.3	5.2	16.0	13.90	87.5	2710	1~2	可用于制造承受中等冲击的模具
W-Ta-Nb-Ti-Co类硬质合金											
CW-1	68.9	6.7	5.4	1.6	6.7	10.7	11.90	91.0	2110	2~4	用于对碳钢和合金钢零件进行连续或断续粗加工
CW-2	65.0	11.0	5.8	1.8	7.6	8.8	11.10	91.5	1760	2~4	在中等载荷下切削合金含量在0.3%以上的钢或在重载下切削低碳钢
CW-3	72.2	4.9	7.0	2.3	6.8	6.7	12.45	92.0	1760	2~3和6	用作成刀具及刀尖圆角半径很大的刀具、切削钢
CW-4	67.0	10.0	7.2	2.4	7.4	6.0	11.50	93.0	1410	5~7和12	用于钢的精加工
CW-5	75.3	3.2	5.2	1.6	6.2	8.5	12.90	91.5	1930	2~4	用于钢铸件或铸件的粗加工
W-Ta-Co类硬质合金											
CX-1	84.96	-	2.81	-	5.73	6.5	14.75	91.5	1760	3	用于铸铁与非铁材料的一般加工
CX-2	69.47	-	18.76	-	5.77	6.0	14.70	91.3	1270~1760	1~3	用于合金铸铁及类似材料的加工
CX-3	53.51	-	25.33	-	5.16	16.0	13.55	85.0	1580~2280	4~5	适于在高温下使用, 如用于热压加工

(续) 美国硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In America

统一牌号 Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)						物理-力学性能 Physical Properties				用途举例 Usage Examples
	W	Ti	Ta	Nb	C	Co	密度 Density /g.cm ⁻³	硬度 (HRA)	Obb/ Mpa	晶粒尺寸 Particle Size /um	
CX-4	75.10	-	9.38	-	5.52	10.0	14.5	90.0	1760	2~3	用于钢的粗加工
CX-5	70.41	-	4.69	-	4.90	20.0	13.25	85.0	2530	1~2	可在中等及猛烈冲击条件下使用
CX-6	66.65	-	16.88	-	5.47	11.0	14.15	89.4	2000	1~4	用于钢的粗加工
CX-7	65.72	-	4.69	-	4.59	25.0	13.1	84.3	2320	1~2	可在极剧烈的冲击条件下使用
CX-8	90.30	-	0.30	-	5.90	3.50	15.1	92.5	1410	2~3	用于铸铁粗加工和轻载荷切削非金属材料
W-Ti-Co类硬质合金											
CY-1	77.92	4.00	-	-	6.80	12.0	13.00	90.3	1560	2~1	用于钢的粗加工
CY-2	78.86	8.00	-	-	7.14	6.0	12.85	92.0	1460	1~1	用于轻载荷下钢的精加工
CY-3	76.98	6.40	-	-	6.62	10.0	12.55	90.5	1230-1760	4~3	用于钢的一般加工
CY-4	77.92	3.20	-	-	5.88	13.0	14.10	89.5	2180	1~4	用作强烈振动与冲击条件下的耐磨零件
CY-5	76.98	8.00	-	-	7.02	8.0	12.00	91.5	1340-1580	3	用于钢的一般加工
CY-6	75.10	9.60	-	-	7.30	8.0	11.75	91.8	1410	1~2	用于钢的精加工
CY-7	71.35	12.80	-	-	7.85	8.0	11.15	91.5	980-1480	4~3	用于轻载荷下钢的精加工
CY-8	75.10	12.80	-	-	8.10	4.0	11.00	92.0	840	2	用于钢的精磨
CY-9	64.31	19.99	-	-	9.20	6.5	9.80	92.0	1270	3~4	用于钢的精磨 (耐磨性较CY-8高)
CY-10	57.27	25.59	-	-	10.14	7.0	9.10	92.5	770-1410	3	用于钢的精磨 (耐磨性较CY-9高)
CY-11	81.68	3.20	-	-	6.12	9.0	13.35	90.8	1550	1	用于钢的粗加工
CY-12	75.10	8.00	-	-	6.90	10.0	12.15	90.8	1760	1~2	用于钢的粗加工和一般加工
CY-13	71.35	12.00	-	-	7.65	9.0	11.20	91.7	1130	4~3	用于轻载荷与中等载荷下钢的粗加工
W-Ta-Ti-Co类硬质合金											
CZ-1	79.80	3.20	0.94	-	6.06	10.0	13.35	90.5	1340-2110	3~4	用于钢的粗加工
CZ-2	71.35	9.60	3.75	-	7.30	8.0	11.8	92.0	1160-1580	3~4	用于轻载荷下钢的粗加工
CZ-3	70.41	9.60	4.69	-	7.30	8.0	11.8	91.5	1160-1580	2~3	用于轻载荷下钢的粗加工 (硬度较CZ-2高)
CZ-4	68.06	8.00	7.50	-	6.94	9.5	12.0	91.0	1760	3	用于钢的一般加工
CZ-5	47.88	25.59	9.38	-	10.15	7.0	9.00	92.7	700	2~3	用于钢的精磨
CZ-6	87.31	0.12	3.61	-	5.90	3.0	15.10	92.2	1050-1760	1~3	用于轻载荷下铸铁和非金属材料的精加工

德国硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In Germany

合金牌号 Carbide Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)			物理-力学性能 Physical Properties			用途举例 Usage Examples	国际标准 ISO分类号
	WC	TiC+ TaC	Co	密度 Density /g.cm ⁻³	硬度 Hardness (HV)	抗弯强度 Bending Strength /Mpa		
-	30	64	6	7.2	1800	750		P01.2
-	51	43	6	8.5	1750	900		P01.3
-	62	33	5	10.1	1750	1000		P01.4
-	77	18	5	12.2	1700	1100		P05
S1	63	28	9	10.7	1600	1300	适用于高速、小走刀量车削与铣削钢	P10
S2	76	14	10	11.9	1500	1500	适用于中等速度与中等走刀量 下车削、铣削和刨削钢	P20
S25	71	20	9	12.4	1450	1750	特别适用于粗铣钢、用作薄片铣刀等	P25
S3	82	8	10	13.1	1450	1750	适于中等与低速以及大走刀量 下车削、刨削钢和铸铁	P30
S4	75	12	13	12.7	1400	1950		P40
S5	68	15	17	12.5	1300	2200		P50
M1	84	10	6	13.1	1700	1350	特别适用于车削高合金钢, 如锰钢, 高合金不锈钢等	M10
M2	82	10	8	13.4	1550	1650	特别适于加工奥氏体合金钢, 锰钢, 铸钢, 可锻铸铁, 耐高温材料等	M20
-	81	10	9	14.4	1450	1800		M30
-	79	6	15.0	13.6	1300	2100		M40
H3	92	4 ¹⁾	4	15.0	1800	1200	用于加工硬铸铁, 难加工的塑料等	K01
H2	91	3 ¹⁾	6	14.5	1750	1350	用于加工硬铸铁, 轻金属和塑料	K05
H1	92	2 ¹⁾	6	14.8	1650	1500	用于车、铣铸铁、玻璃、塑料、 淬火钢; 钻削、铰削钢和铸铁	K10
G1	92	2	6	14.8	1550	1700	用于车、铣铸铁、铜和轻金属合金、 塑料; 木材加工以及用作各种耐磨零件	K20
-	89	2	9	14.4	1440	1900		K30
G2	88	-	12	14.3	1300	2100	用于木工刀具, 拉拔丝模具以及钻探工具	K40
-	94	-	6	14.8	1600	1500		G05 ²⁾
G1	94	-	6	14.8	1550	1600		G10
-	91	-	9	14.5	1450	1900	同G1(K20)	G15
G2	88	-	12	14.0	1300	2100	同G2(K40)	G20
G3	85	-	15	13.8	1200	2400	用作冲压, 拉拔丝模具等	G30
G4	80	-	20	13.5	1100	2600	用作冲压, 拉拔丝模具等	G40
G5	75	-	25	13.1	1000	2700	用作冲压, 拉拔丝模具等	G50
G6	70	-	30	12.8	900	2800	用作冲压, 拉拔丝模具等	G60

英国硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In UK

合金牌号 BHMA ^① Carbide Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)					密度 Density /g.cm ⁻³	硬度 Hardness (HV)	抗弯强度 Bending Strength /Mpa	近似的牌号 Similar Grade ISO
	WC	TiC	TaC	Co	Ni-Mo				
9-1-9	-	80	-	-	20	5.8	1900	550	P01.2
7-1-9	50	35	7	8	-	8.8	1850	750	P01.3
9-2-6	78	16	-	6	-	11.4	1825	850	P05
7-2-6	77	15.5	0.5	7	-	11.4	1725	900	P10
6-3-5	78	12	3	7	-	11.7	1660	950	P15
4-4-4	79	8	5	8	-	12.1	1580	1050	P20
3-4-4	82	6	4	8	-	12.9	1530	1100	P25
3-5-3	85	5	2	9	-	13.3	1490	1200	P30
2-6-3	85	5	-	10	-	13.4	1420	1250	P40
1-8-2	78	3	3	16	-	13.1	1250	1500	P50
4-5-2	85	5	4	6	-	13.4	1590	1150	M10
3-6-3	82	5	5	8	-	13.3	1540	1250	M20
2-6-3	86	4	-	10	-	13.6	1440	1300	M30
2-7-3	84	4	2	10	-	14.0	1380	1350	M40
9-3-0	97	-	-	3	-	15.2	1850	950	K10
8-3-0	95	-	1	4	-	15.0	1780	1000	K05
7-4-1	92	-	2.5	5.5	-	14.9	1730	1100	K10
5-6-0	94	-	-	6	-	14.8	1650	1250	K20
2-8-0	91	-	-	9	-	14.4	1400	1450	K30
2-9-0	89	-	-	11	-	14.1	1320	1550	K40

①BHMA-英国硬质合金协会 (British Hard Metal Association).

俄罗斯硬质合金牌号、化学成分及性能

Cemented Carbide Grade, Chemical Composition and Properties In Russia

类别 Type	合金牌号 BHMA ^① Carbide Grade	化学成分 (质量分数) (%) Chemical Composition (Mass Fraction)				密度 Density /g.cm ⁻³	硬度 Hardness (HV)	抗弯强度 Bending Strength /Mpa
		WC	TiC	TaC	Co			
钨钴类	BK2	98	-	-	2	15.2	90.0	1000
	BK3	97	-	-	3	15.0~15.3	89.5	1100
	BK3-M	97	-	-	3	15.0~15.3	91.0	1100
	BK4	95	-	-	4	14.9~15.2	89.5	1400
	BK4-B	96	-	-	4	14.9~15.2	88.0	1400
	BK6	94	-	-	6	14.6~15.0	88.5	1500
	BK6-M	94	-	-	6	14.8~15.1	90.0	1350
	BK6-OM	92	-	2	6	14.7~15.0	90.5	1200
	BK6-B	94	-	-	6	14.6~15.0	87.5	1550
	BK-8	92	-	-	8	14.4~14.8	87.5	1600
	BK8-B	92	-	-	8	14.4~14.3	86.5	1750
	BK8-BK	92	-	-	8	14.5~14.8	86.5	1750
	BK10	90	-	-	10	14.2~14.6	87.0	1650
	BK10-M	90	-	-	10	14.3~14.6	88.0	1500
	BK10-OM	88	-	2	10	14.3~14.6	88.5	1400
BK10-KC	90	-	-	10	14.2~14.6	85.0	1750	
钨钴类	BK11-B	89	-	-	11	14.1~14.4	86.0	1800
	BK11-BK	89	-	-	11	13.9~14.1	86.0	1800
	BK15	85	-	-	15	13.9~14.1	86.0	1800
	BK20	80	-	-	20	13.4~13.7	84.0	1950
	BK20-KC	80	-	-	20	13.4~13.7	82.0	2050
	BK20-K	80	-	-	20	13.4~13.7	79.0	1550
BK25	75	-	-	25	12.8~13.2	82.0	2000	
钨钴钽类	T30K4	66	30	-	4	9.5~9.8	92.0	950
	T15K6	79	15	-	6	11.1~11.6	90.0	1150
	T14K8	78	14	-	8	11.2~11.6	89.5	1250
	T5K10	85	6	-	9	12.4~13.1	88.5	1400
	T5K12	83	5	-	12	13.1~13.5	87.0	1650
钨钽钨钼类	TT7K12	81	4	3	12	13.0~13.3	87.0	1650
	TT8K6	84	8	2	6	12.8~13.3	90.5	1250
	TT10K8-B	82	3	7	8	13.5~13.8	89.0	1300
	TT20K9	71	8	12	9	12.0~13.0	89.0	1300

中外合金结构钢钢号近似对照表

中国与亚太各国 (一)

Alloy Structural Steel Comparison Table Between China and Foreign Countries
China and The Asia-Pacific Region(One)

No.	中国 China GB	中国台湾 Taiwan (China) CNS	日本 Japan JIS	韩国 Korea KS	美国 America		国际标准 化组织 ISO
					ASTM/AISI	UNS	
1	20Mn2	SMn420	SMn420	SMn420	1320	-	22Mn6
2	30Mn2		-		1330	G13300	28Mn6
3	35Mn2	SMn433	SMn433	SMn433	1325	G13350	36Mn6
4	40Mn2	SMn438	SMn438	SMn438	1340	G13400	42Mn6
5	45Mn2	SMn443	SMn443	SMn443	1345	G13450	-
6	50Mn2	-	-	-	-	-	-
7	15MnV	-	-	-	-	-	-
8	20MnV	-	-	-	-	-	-
9	42MnV	-	-	-	-	-	-
10	35SiMn	-	-	-	-	-	-
11	42SiMn	-	-	-	-	-	-
12	40B	-	-	-	-	-	-
13	45B	-	-	-	14B35	-	-
14	40MnB	-	-	-	14B50	-	-
15	15Cr	SCr415	SCr415	SCr415	5115	G51150	-
16	20Cr	SCr420	SCr420	SCr420	5120	G51200	20Cr4
17	30Cr	SCr430	SCr430	SCr430	5130	G51300	-
18	35Cr	SCr435	SCr435	SCr435	5135	G51350	34Cr4
19	40Cr	SCr440	SCr440	SCr440	5140	G51400	41Cr4
20	45Cr	SCr445	SCr445	SCr445	5145	G51450	-
21	50Cr	-	-	-	5150	G51500	-
22	12CrMo	-	-	-	4119	-	-
23	12CrMoV	-	-	-	-	-	-
24	15CrMo ^①	SCM415	SCM415	SCM415	-	-	-
25	20CrMo	SCM420	SCM420	SCM420	4118	G41180	18CrMo4
26	25CrMo ^①	-	-	-	-	-	-
27	30CrMo	SCM430	SCM430	SCM430	-	-	-

No.	中国 China GB	中国台湾 Taiwan (China) CNS	日本 Japan JIS	韩国 Korea KS	美国 America		国际标准 化组织 ISO
					ASTM/AISI	UNS	
28	35CrMo	SCM435	SCM435	SCM435	4135	G41350	34CrMo4
29	35CrMoV	SCM435	SCM435	SCM435	4135	G41350	34CrMo4
30	42CrMo	SCM440	SCM440	SCM440	4140	G41400	42CrMo4
31	25Cr2MoVA	-	-	-	-	-	-
32	25Cr2Mo1VA	-	-	-	-	-	-
33	20Cr3MoWVA	-	-	-	-	-	-
34	38CrMoA1	-	-	-	-	-	41Cr AIMo74
35	20CrV	-	-	-	6120	-	-
36	50CrVA	SUP10	SUP10	SPS6	6150	G61500	13
37	15CrMn	-	-	-	5115	G51150	-
38	20CrMn	-	SMnC420	SMnC420	5120	G51200	20MnCr5
39	20CrMnSi	-	-	-	-	-	-
40	30CrMnSi	-	-	-	-	-	-
41	35CrMnSiA	-	-	-	-	-	-
42	20CrMnMo	-	SCM421	SCM421	4119	-	-
43	40CrMnMo	-	SCM440	SCM440	4142	G41420	42CrMo4
44	20CrMnTi	-	-	-	-	-	-
45	30CrMnTi	-	-	-	-	-	-
46	20CrNi	-	-	-	3140	G31400	-
47	40CrNi	-	-	-	3140	G31400	-
48	50CrNi	-	-	-	3140	G31400	-
49	12CrNi2	SNC415	SNC415	SNC415	3415	-	-
50	12CrNi3	SNC815	SNC815	SNC815	3310	G33106	15NiCr13
51	20CrNi3	-	-	-	-	-	-
52	30CrNi3	SNC836	SNC836	SNC836	3435	-	-
53	12CrNi4	-	-	-	2515	-	-
54	20Cr2Ni4	~SNC815	~SNC815	~SNC815	3316	-	-
55	18Cr2Ni4WA	~SNC815	~SNC815	~SNC815	3316	-	-
56	20CrNiMo	SNM220	SNM220	SNM220	8620	G86200	20NiCrMo2
57	40CrNiMo	SNM439	SNM439	SNM439	4340	G43400	-
58	45CrNiMoVA	SNM439	SNM439	SNM439	4340	G43400	-

中国与欧洲各国 (二)
China and European Countries (Two)

No.	中国 China GB	德国 Germany		法国 France NF	瑞典 Swiss Ss14	英国 UK BS
		DIN	W-Nr			
1	20Mn2	20Mn6	1.1169	20M5	-	150M19
2	30Mn2	30Mn5	1.1165	32M5	-	150M28
3	35Mn2	36Mn5	1.1167	35M5	2120	150M36
4	40Mn2	-	-	40M5	-	-
5	45Mn2	46Mn7	1.0912	45M5	-	-
6	50Mn2	50Mn7	1.0913	55M5	-	-
7	15MnV	15MnV5	1.5213	-	-	-
8	20MnV	20MnV6	1.5217	-	-	-
9	42MnV	42MnV7	1.5223	-	-	-
10	35SiMn	37MnSi5	1.5122	38MS5	-	En46 ²
11	42SiMn	46MnSi4	1.5121	41S7	-	En46 ²
12	40B	-	-	-	-	170H41
13	45B	-	-	-	-	-
14	40MnB	-	-	38MB5	-	185H40
15	15Cr	15Cr3	1.7015	12C3	-	523A14 523M15
16	20Cr	20Cr4	1.7027	18C3	-	527A20
17	30Cr	28Cr4	1.703	32C4	-	530A30
18	35Cr	34Cr4	1.7033	38C4	-	530A36
19	40Cr	41Cr4	1.7035	42C4	2245	530A40 530M40
20	45Cr	-	-	45C4	-	-
21	50Cr	-	-	50C4	-	-
22	12CrMo	13CrMo44	1.7335	12CD4	2216	1501-620 Cr27
23	12CrMoV	13CrMo44	1.7335	12CD4	2216	1501-620 Cr27
24	15CrMo ⁶	15CrMo5	1.7262	15CD4.05	-	1501-620 Cr31
25	20CrMo	20CrMo5	1.7264	18CD4	-	CDS12
26	25CrMo ⁶	25CrMo4	1.7218	25CD4	2225	-
27	30CrMo	-	-	30CD4	-	-
28	35CrMo	34CrMo4	1.722	35CD4	2234	708A37
29	35CrMoV	34CrMo4	1.722	35CD4	2234	CDS13

No.	中国 China GB	德国 Germany		法国 France NF	瑞典 Swiss Ss14	英国 UK BS
		DIN	W-Nr			
30	42CrMo	42CrMo4	1.7225	42CD4	2244	708M40
31	25Cr2MoVA	24CrMoV55	1.7733	-	-	-
32	25Cr2Mo1VA	24CrMoV55	1.7733	-	-	-
33	20Cr3MoWVA	21CrVMoW12	-	-	-	-
34	38CrMoAl	41CrAlMo7	1.8509	40CAD6.12	2940	905M39
35	20CrV	21CrV4	1.7510	-	-	-
36	50CrVA	-	1.8159	50CV4	2230	735A50
37	15CrMn	16MnCr5	1.7131	16MC5	2511	-
38	20CrMn	20MnCr5	1.7147	20MC5	-	-
39	20CrMnSi	51CrV4 (50CrV4)	-	-	-	-
40	30CrMnSi	-	-	-	-	-
41	35CrMnSiA	-	-	-	-	-
42	20CrMnMo	-	-	-	-	-
43	40CrMnMo	42CrMo4	1.7225	-	-	708A42
44	20CrMnTi	30MnCrTi4	1.8401	-	-	-
45	30CrMnTi	30MnCrTi4	1.8401	-	-	-
46	20CrNi	40NiCr6	1.5711	-	-	640M40
47	40CrNi	40NiCr6	1.5711	-	-	640M40
48	50CrNi	40NiCr6	1.5711	-	-	640M40
49	12CrNi2	14NiCr10	1.5732	14NC11	-	-
50	12CrNi3	14NiCr14	1.5752	14NC12	-	-
51	20CrNi3	-	-	20NC11	-	-
52	30CrNi3	31NiCr14	1.5755	30NC11	-	653M31
53	12Cr2Ni4	14NiCr18	1.586	12NC15	-	659M15
54	20Cr2Ni4	~14NiCr14	1.5752	18NC13	-	~665M13
55	18Cr2Ni4WA	~14NiCr14	1.5752	18NC13	-	~665M13
56	20CrNiMo	21NiCrMo2	1.6523	20NCD2	2506	805M20
57	40CrNiMo	36CrNiMo4	1.6511	40NCD3	-	816M40
58	45CrNiMoVA	36CrNiMo4	1.6511	40NCD3	-	816M40