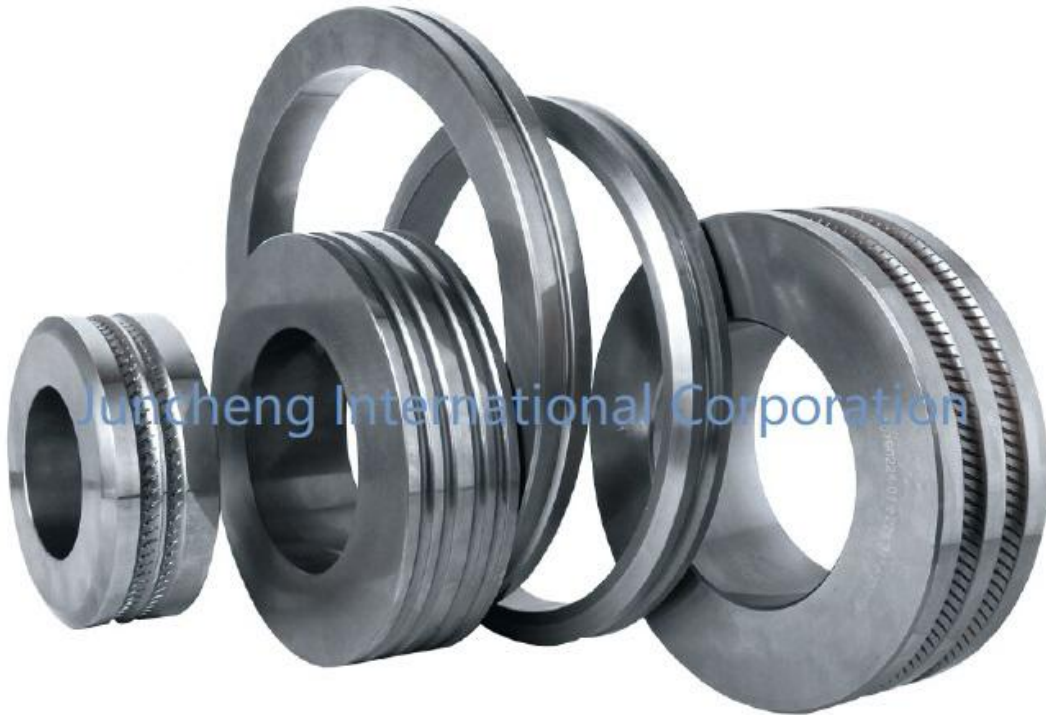


骏 诚  
JUN CHENG

Juncheng International Corporation Limited

No.2204, Building 16, Feicuiwan, Wuling, Changde, Hunan, China zip415000

## Tungsten Carbide Roll Catalog



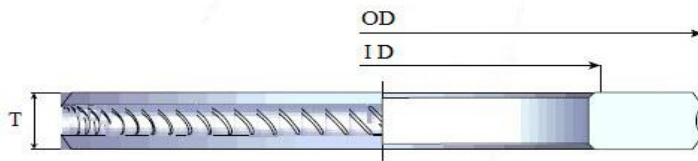
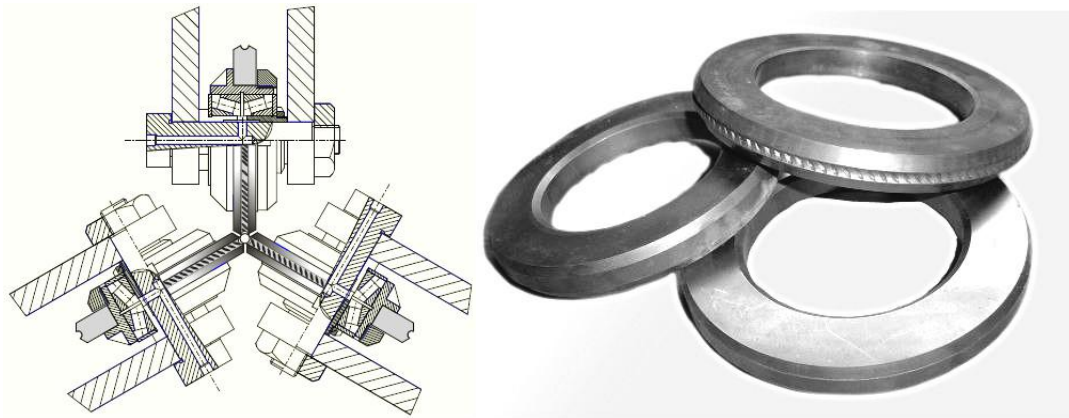
JUNCHENG is manufacture and supplier of roller and dies which are used in iron and steel products making. Now our clients extend all over the world, especially in Latin America, Eastern Europe, Southeast Asia, USA, Spain, India, Germany and Italy.

We are one of the largest tungsten roll maker in China. Our products include TC hot and cold rolls, TC composite rolls for high speed rolling mill, thread roll, rolling roll for tube, pinch roll, accessory roll etc.

Our clients include many world famous steel group and Rolling Mill group, like ArcelorMittal, Gerdau Group, Celsa, Votorantim group, Qatar Steel Company FEZ, Aceros ZAPLA SA. Argentina, India Kamachi etc. We can supply rolls of diameter 50mm - 550mm, height 10mm - 190mm.

\*\*\* Tungsten carbide cold roll for rebar

Tungsten carbide sizing(CA),forming(FO),reducing(RO&RT) and profiling(PR) rolls are used for producing smooth or ribbed steel bar in the construction field.



Type	mm	OD	mm	ID	mm	T	mm	Wire Range	mm	Available
123*82*15		123		82		15		3 - 8.5		RO RT CA FO PR
123*82*20		123		82		20		9 - 12		
125*82*15		125		82		15		3 - 8.5		
125*82*20		125		82		20		9 - 12		
140*90*15		140		90		15		3 - 8.5		
140*90*20		140		90		20		9 - 12		
150*90*15		150		90		15		3 - 8.5		
150*90*20		150		90		20		9 - 12		
90*60*15		90		60		15				
Grade and Materials : JG15 85% WC + 15% Co HRA 87 TRS 2900 N/mm2										

Dimension list

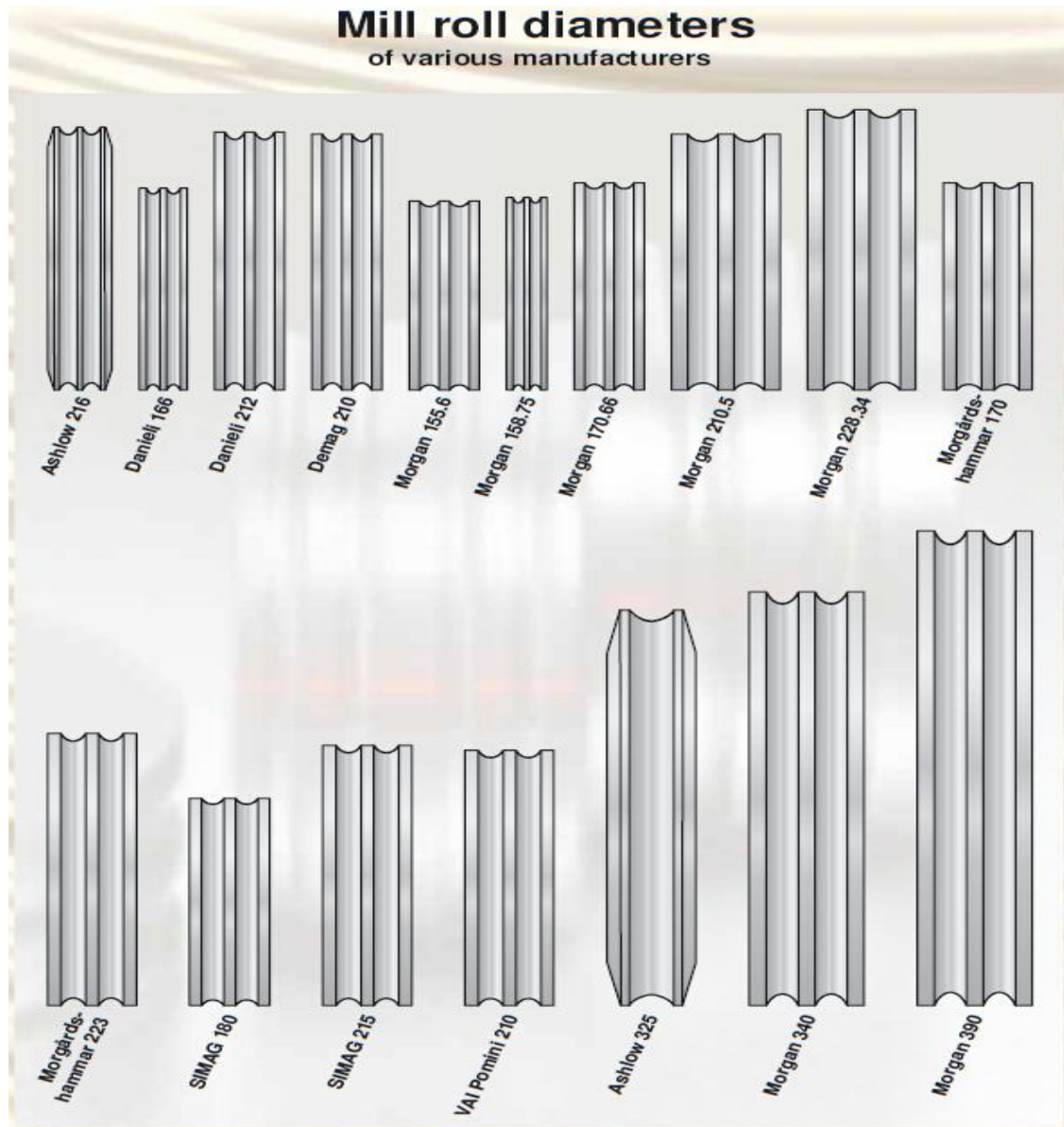
Sequence of Rolls for Smooth Wire						Sequence of Rolls for Reinforcing Wire					
Rod Wire	First Pass		Second Pass		Smooth Wire	Rod Wire	First Pass		Second Pass		Reinforcing Wire
	Oval reducing Rolls	Round reducing Rolls	Oval reducing Rolls	Sizing Rolls			Oval reducing Rolls	Round reducing Rolls	Forming Rolls	Profiling Rolls	
4.0	RO 0	RT 0	RO 0	CA 3.0	3.0	4.0	RO 0	RT 0	FO 0	PR 3.0	3.0
4.5	RO 0	RT 0	RO 0	CA 3.5	3.3	4.5	RO 0	RT 0	FO 0	PR 3.5	3.5
5.0	RO 1	RT 1	RO 0	CA 4.0	4.0	5.0	RO 1	RT 1	FO 1	PR 4.0	4.0
5.5	RO 1	RT 1	RO 1	CA 4.5	4.5	5.5	RO 1	RT 1	FO 1	PR 4.5	4.5
6.0	RO 2	RT 2	RO 1	CA 5.0	5.0	6.0	RO 2	RT 2	FO 1	PR 5.0	5.0
7.0	RO 2	RT 2	RO 1	CA 5.5	5.5	7.0	RO 2	RT 2	FO 1	PR 5.5	5.5
7.5	RO 3	RT 3	RO 2	CA 6.0	6.0	7.5	RO 3	RT 3	FO 2	PR 6.0	6.0
8.0	RO 3	RT 3	RO 2	CA 6.5	6.5	8.0	RO 3	RT 3	FO 2	PR 6.5	6.5
8.5	RO 4	RT 4	RO 3	CA 7.0	7.0	8.5	RO 4	RT 4	FO 2	PR 7.0	7.0
9.0	RO 4	RT 4	RO 3	CA 7.5	7.5	9.0	RO 4	RT 4	FO 3	PR 7.5	7.5
10	RO 5	RT 5	RO 4	CA 8.0	8.0	10	RO 5	RT 5	FO 3	PR 8.0	8.0
11	RO 5	RT 5	RO 4	CA 8.5	8.5	11	RO 5	RT 5	FO 3	PR 8.5	8.5
11	RO 5	RT 5	RO 5	CA 9.0	9.0	11	RO 5	RT 5	FO 3	PR 9.0	9.0
12	RO 6	RT 6	RO 5	CA 9.5	9.5	12	RO 6	RT 6	FO 4	PR 9.5	9.5
13	RO 6	RT 6	RO 5	CA 10.0	10.0	12	RO 6	RT 6	FO 4	PR 10.0	10.0
13	RO 6	RT 6	RO 5	CA 10.5	10.5	13	RO 6	RT 6	FO 4	PR 10.5	10.5
14	RO 7	RT 7	RO 6	CA 11.0	11.0	14	RO 7	RT 7	FO 4	PR 11.0	11.0
14	RO 7	RT 7	RO 6	CA 11.5	11.5	14	RO 7	RT 7	FO 4	PR 11.5	11.5
15	RO 7	RT 7	RO 6	CA 12.0	12.0	15	RO 7	RT 7	FO 4	PR 12.0	12.0



Customize your rib type and logo in groove.

**\*\*\* Tungsten carbide hot rolls**

Juncheng is one of the TC hot rolls supplier in China. We have 1000 T pressing machine, 300Mpa CIP, 60 bar sinter-HIP furnace, high precision grinding machine, ultrasonic flaw detector, laser marker who can ensure good quality of each roll. We can supply rolls of diameter 50mm - 550mm, height 10mm - 250mm





• 冷轧带肋钢筋三维辊环  
Roll Ring for Cold Rolling Ribbed Bar



• 轧机硬质合金配件  
Cemented Carbide Rolls Accessories



• 夹送辊  
Pinch Roll



• 三维硬质合金辊环  
Three Dimensional Roll



• 高速轧机辊环  
Roll Ring for PFM



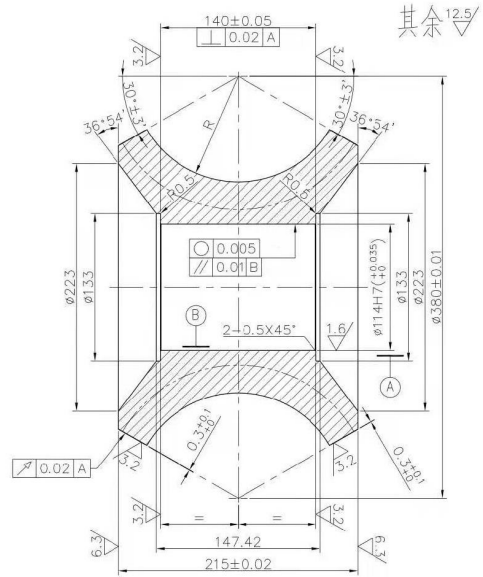
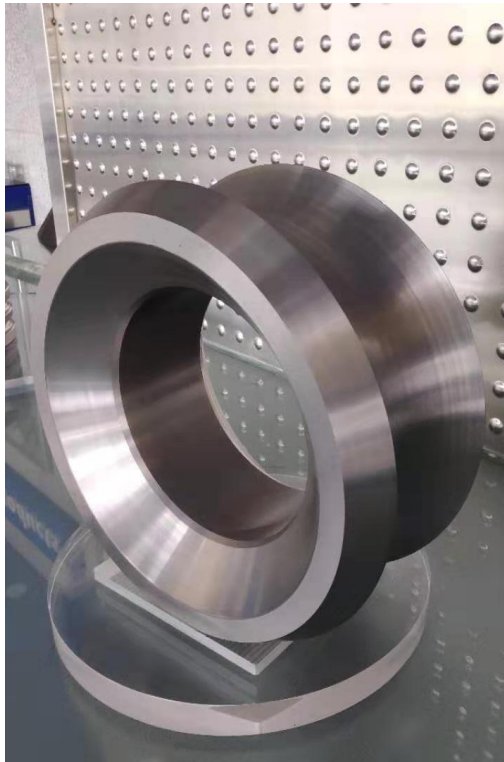
• 螺纹辊  
Thread Roll



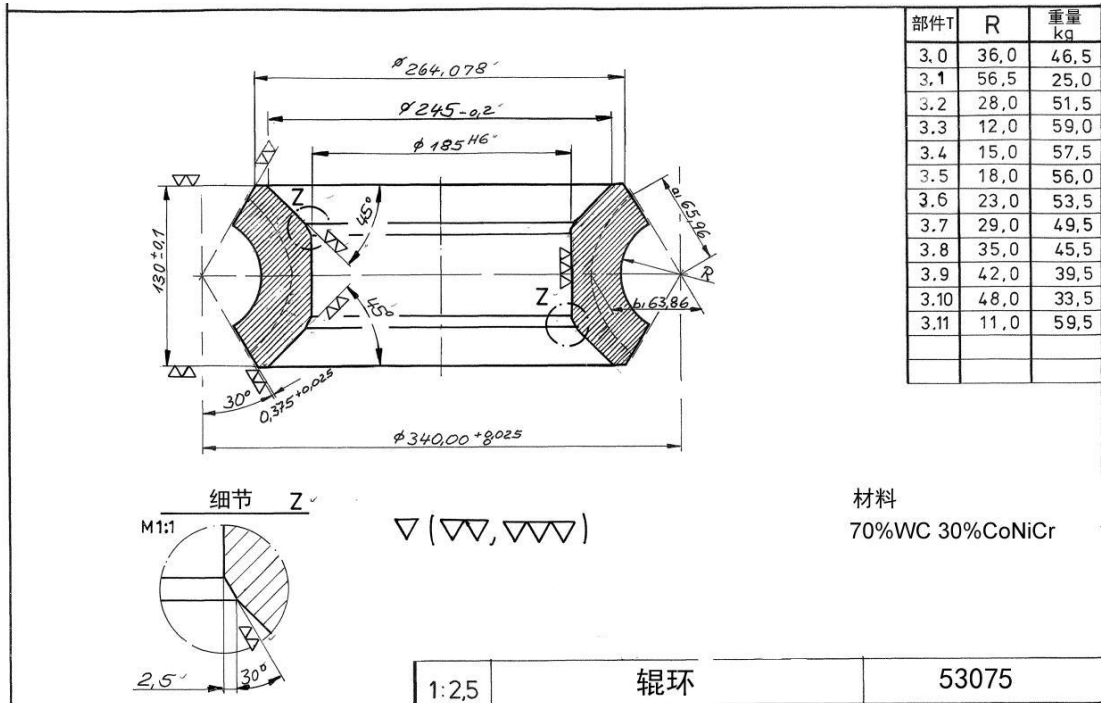
• 热轧棒材复合辊 (外径最大可达到  $\Phi 550\text{mm}$ )  
Composite roll (external diameter Max 550mm)



TC Tube Rolls



- 技术要求:
1. 轧辊材料均匀, 不允许有内部缺陷, 冲击韧性 $a_k/30Nm/mm^2$ .
  2. 锯面硬度HSD60-65, 重车后硬度降HSD5.
  3. 制造厂粗加工孔型R后装配, 最终精确孔型由用户加工, 重车量由用户具体情况确定.



\*\*\* Tungsten Carbide Composite rolls



Make Angle Bar



Make Flat Bar



Make Round Bar

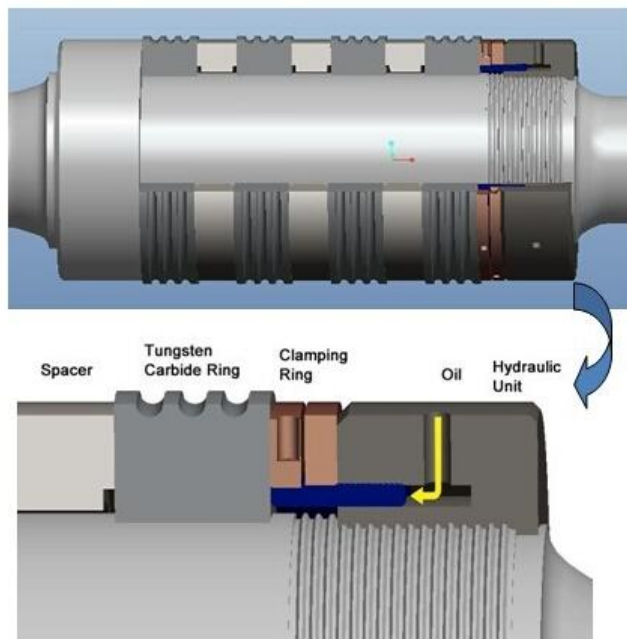


Make Rebar

The max external diameter is 520mm

Structure Features

- No Keys between alloy steel shaft and TC rings
- Stable and reliable clamping system.
- Easy to assemble and disassemble



For the cast iron and steel rolls changed into TC composite rolls, please supply follow datas

- 1, the drawing of iron rolls,
- 2, the detailed drawing of the groove on composite roll
- 3, rolling materials, speed
- 4, max and min working diameter of iron rolls

We need above information at least and will design the composite rolls for you.

The composite rolls we have made and sold are more than 200sets, so we have good experiences to meet your requirements.

### Grade of TC Roll

Grade	Co+Ni+Cr %	WC%	Density g/cm <sup>3</sup>	Hardness HRA	T.R.S. N/mm <sup>2</sup>	Compressive strength N/mm <sup>2</sup>
JC06	6	94	14.9	88.5	2800	4300
JC08	8	92	14.7	88	2850	4100
JC10	10	90	14.5	86.5	2800	3900
JC13	13	87	14.3	85	2700	3700
JC15	15	85	14.05	84.5	2650	3500
JC14	14	86	14	87	2580	4000
JC18	18	82	13.7	83.5	2580	3300
JC20	20	80	13.6	82	2580	3100
JC20X	20	80	13.4	82.5	2650	3000
JC22	22	78	13.4	81.5	2650	3000
JC25	25	75	13.1	80	2500	2900
JC27	27	73	12.9	78.5	2400	2700
JC28	28	72	12.8	78.5	2300	2600
JC30	30	70	12.6	77.5	2300	2600
JC30X	30	70	12.7	79.5	2550	2800
JC30Y	30	70	12.65	80	2560	2800



Grade Comparison Table							
Grade	Cerametal	Sandvik	Kennametal	Sintermet	Mitsubishi	Saramet	TeaguTec
JC06	CE3/CT C12A	H6T	MN0			VN07	
JC08				SM-80	GX210		T09L/
JC10	CE51/CT C20A	C10C	MN04	SM-63		VN10	KHR05/ T11L
JC13	CE65/CT C25A				GX225	VN13	T14L/K HR30
JC15	CE79/CT C30A	C15C	MN2	SMX-78	GX230	VN40	T15M/K HR10
JC18	CE103/C TC35A				GX335	VN45	T17L/K HR40
JC20	CE107/C TC40A	C20C	MN4	SMX-75	GX340	VN50	T20M/K HR60
JC22	CE112/C TC44A						T23L/K HR70
JC25	CE114/C TC50A	C25C	RCV5	SMX-70	GX350	VN70	T25H/K HR75
JC27			G55		GX360		T27M/K HR80
JC30	CE115C TC60A	C30T	C30T	SMX-69	GX365	VN77	T30M/K HR90
JC30X		H30P	H30P			VN76	T30H/K HR90A

● First recommendation ▲ Second recommendation

Grade	Intermediate		Prefinish				Finish										Reducing				Rebar	
	A	B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
JC30X																						●
JC30	▲	▲																				
JC28	●	●	▲	▲	▲	▲																
JC27	▲	▲	●	●	●	●																
JC26	▲	▲			▲	▲																▲
JC20X							●	●														▲
JC20							●	●	●								▲	▲				▲
JC18							▲	▲	▲	●	●	▲					●	●				
JC14															▲	▲			●	●		
JC13										▲	▲	▲	▲	▲	▲	▲			▲	▲		
JC10														●	●				▲	▲		
JC08														●	●				●	●		
JC06														●	●				●	●		

## Use Introduction of TC Roll

### Grade Selection

In light of the variety of rolled steel products and the different characteristics of mill stands, selecting a correct carbide roll grade is the first priority to optimize the mill condition.

### Roll Installation

The bushing and the assembly of roll ring must be carried out in accordance with technical standard. The tension between the roll ring and the machine frame and the taper sleeves must be appropriate. If it is too tight, the roll rings will be stressful, even a bit more rolling force can cause the cracks of the roll rings; if it is too loose, the roll ring, shaft and taper sleeve will slide between each other, which may scrape the shaft and sleeve. When starting the bushing and assembly of the roll rings, make sure the fitting sides of the roll ring, shaft and taper sleeve are kept in clean. During the transportation and installation of the roll rings, hammer striking, colliding is extremely prohibited.

### Cooling Condition

The function of cooling is to reduce the impact of thermal etching and thermal fatigue to the grooves. And cooling also helps prevent the roll rings from cracking and heat stress during the heat rolling. Meanwhile, cooling can defer the expansion of the tiny crack and prolong the service life of the roll rings. Hence, the cooling performance has direct influence on the abrasion rate of the roll rings and its grooves.

Water pressure 4-6bar Water discharge: 18m<sup>3</sup> per hour for each stand Water discharge for the last stand: 24m<sup>3</sup> per hour for each stand Water injection angle: radial direction, 15-30 degree from the rotating of the roll rings. Water must be injected straightly into the groove. No Scattering or spraying of the water

### Groove grinding

The micro crack in the roll ring grooves is inevitable during the rolling process. When the cracks reach a certain degree (approx. 0.02mm), the roll rings need to be unloaded for grinding. This is necessary to avoid the further expansion of the micro cracks which might eventually result in the damage of the roll rings. The micro cracks must be completely grinded off. Otherwise the remaining cracks would cause the damage of the roll rings in the next rolling. Normally, the grinding degree is limited to 0.4-0.6mm for the front stands, 0.7-1.2mm for the latter stands. Non-destructive testing method like dye-penetrant technology can be used to detect the flaw.

The size and shape of each cemented carbide roll ring are designed to fit the particular finishing mill. Although the designed work load is 3-4 times as big as the actual production is required, yet the tensile strength of the cemented carbide is comparatively low. Overloading would destroy the fixture between the shafts and roll rings as well as the taper sleeve and roll rings. The partially augmented tension will crack the roll rings. The tension might be the result of the following factors.

- (1) The fitting between the shafts and the roll rings, between the taper sleeves and the roll rings is too tight.
- (2) Rolled material is low temperature steel
- (3) Pile-up accident occurred

### Cemented Carbide Rolls Accessories

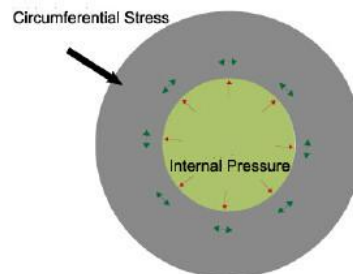
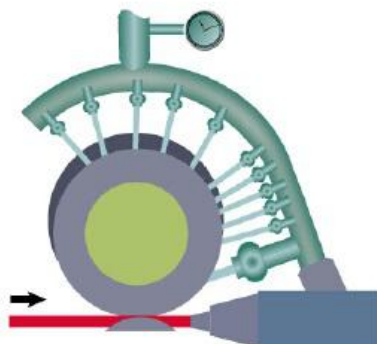


In order to improve the quality of our products and meet the new requirement from the steel company, we have developed various kinds of accessories in cemented carbide and titanic carbide mills. For example: T.C. pinch roller, Finishing guide roll, Finishing mill guide plate, Cooling water nozzle, Roller table wheel of the Cooling Bed etc. All these accessories have received positive feedback from our customers like Anshan Steel, Nanjing Steel Company Etc. Our company is committed to develop more and better accessories for steel company in the future.

### Water quality

The PH value of the cooling water has great influence on the abrasive degree of the carbide roll rings. When the PH value is below 7.2, its abrasion to the cobalt will be increased; when the PH value is above 7.2, its abrasive property will be largely reduced, not only the lifetime of the roll rings are increased, the machine frame is protected as well.

The volume of solid particle in the cooling water should be kept below 15mg/L. Like grinding agents, the solid particles are abrasive to the bond metal in the roll rings, which will accelerate the expansion of the micro crack in the groove when rolling speed and pressure is high. In this sense, the cooling water must be precipitated and purified.

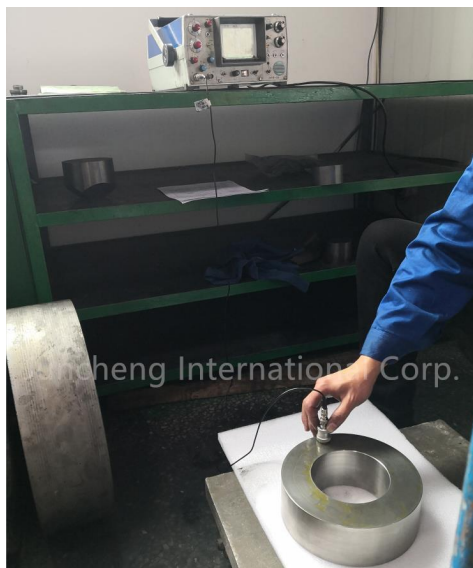


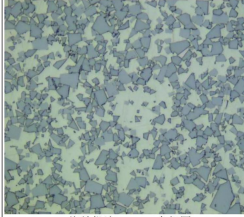

Inappropriate installation of the carbide rings, may result in the high stress inside the rings

Workshop Photo

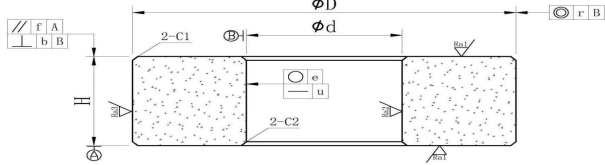


Composite roll finished processing workshop



化学成分/机械性能检测报告 Chemical & Mechanical Properties Report				令号 Type No.	9190952			
				牌号 Grade.	JC30X			
				订单号 Order No.				
				图号 Drawing No.				
烧结批次号 Heat No.	辊环编号 Roll no.	要求值 Required value	化学成分 Chemical composition		机械性能 Mechanical properties			
			碳化钨含量 TC total (wt%)	粘合剂 Binder total (wt%)	硬度 Hardness	密度 Density	抗破裂强度 Transverse rupture strength	晶粒度 Average WC Grain size
			70	30	HRA	g/cm3	≥2480 MPa	3.2~3.4 um
W1951	68-73	实测值 Actual measurements	70	30	79.5	12.673	≥2480	3.2
 <p>烧结批次 W1951 金相图 001 MICROSTRUCTURE (x1000)</p>								
<p>以上结果真实，正确无误 We hereby certify that the above recorded results are true and correct in every details.</p>						检验时间 Inspection time	检验员 Inspector	
						2019. 11. 1	王宝国	

尺寸检验报告				令号 Type No.	9190952	
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Dimension Inspection Report				牌号 Grade.	JC30X									
				订单号 Order No.										
				图号 Drawing No.										
														
辊环编号 Roll no.	要求值 Required value	D	d	H	f	b	r	e	u	Ra1	Ra2	Ra3	C1	C2
		215±0.05	120+0.02	72+0.1~+0.2	0.01	0.01	0.01	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
58	实测值 Actual measurement	214.99	120.008	72.17	0.006	0.005	0.005	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
59		215.03	120.020	72.17	0.007	0.005	0.007	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
60		215.01	120.012	72.17	0.005	0.005	0.005	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
61		215.03	120.015	72.17	0.006	0.007	0.005	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
62		215.00	120.010	72.16	0.005	0.005	0.006	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
63		215.03	120.010	72.17	0.008	0.005	0.008	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
64		214.99	120.015	72.18	0.007	0.005	0.005	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
65		214.99	120.010	72.16	0.005	0.006	0.007	0.005	0.005	0.8	0.4	0.8	1*45°	1*45°
<p>以上结果真实，正确无误 We hereby certify that the above recorded results are true and correct in every details.</p>				检验时间 Inspection time		检验员 Inspector								
				2019. 11. 27		楼俊盛								

尺寸检验报告				令号 Type No.	9190952	
				牌号 Grade.	JC30X	



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