



TSR | RUNFU



TSR | RUNFU



Shanghai Tangshan Heavy Machinery International Co., Ltd  
Address: 1stfloor, Building 2, 38 Debao Road, Pilot Free Trade Zone, Shanghai, China  
Post Code:200131 Website: [www.tsroll.com](http://www.tsroll.com) Email: [service@tsroll.com](mailto:service@tsroll.com)

fACTORY: Jiangsu Runfu Machinery Roll Manufacturing Co., Ltd  
Address: No.2 Rongwen Road, Huangjing Town, Taicang, Jiangsu, China

**Trust Stemming from  
Reliability**



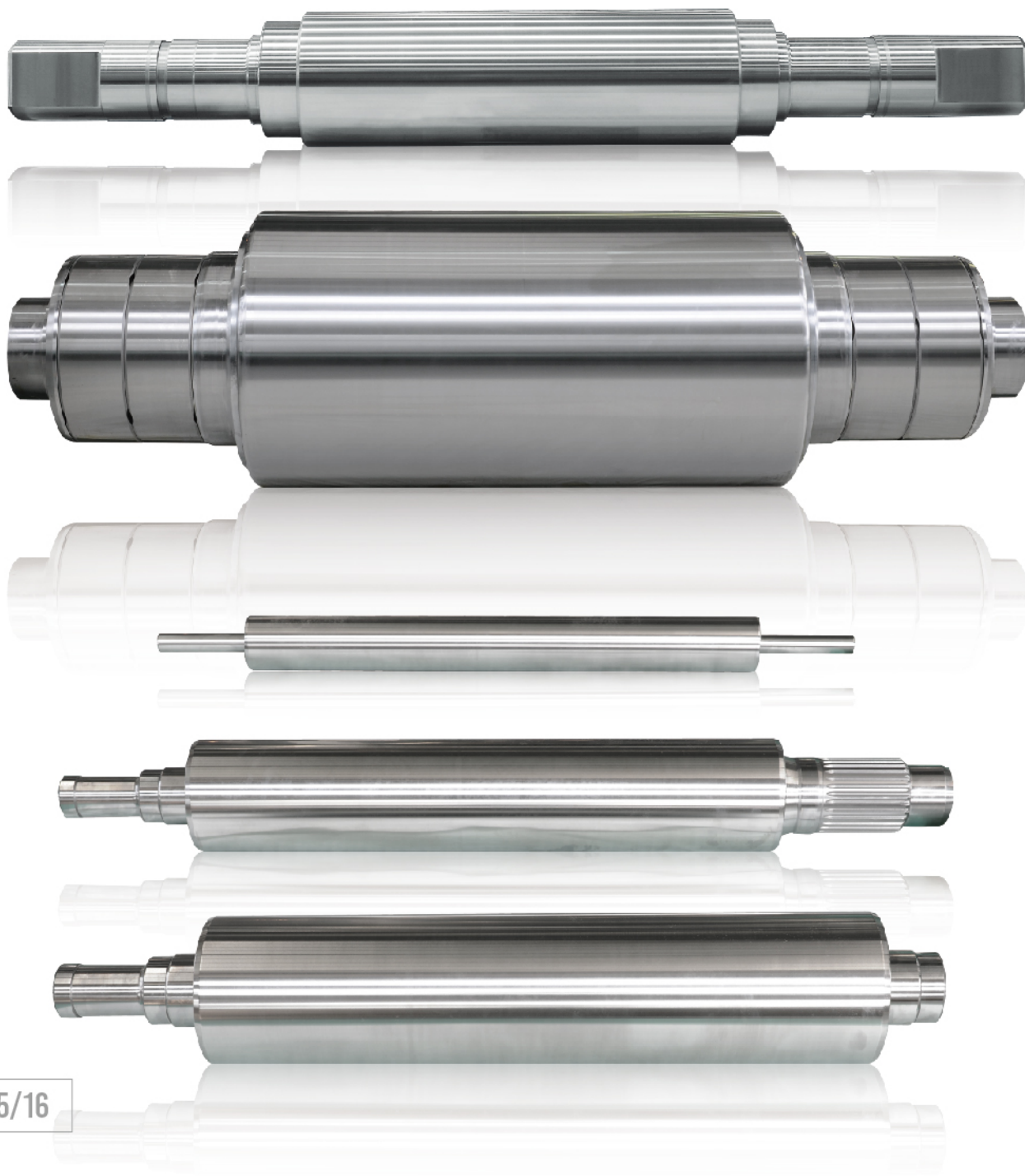
# MODERN WORKSHOP





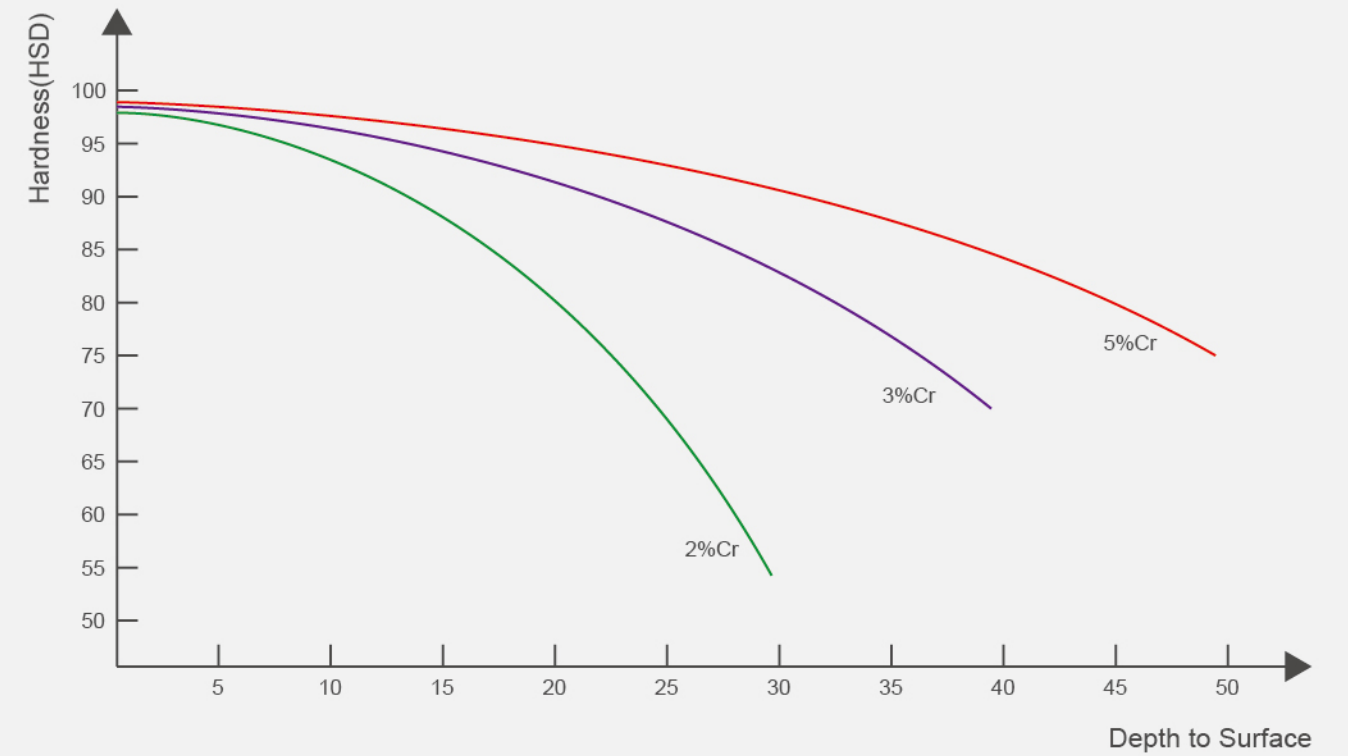
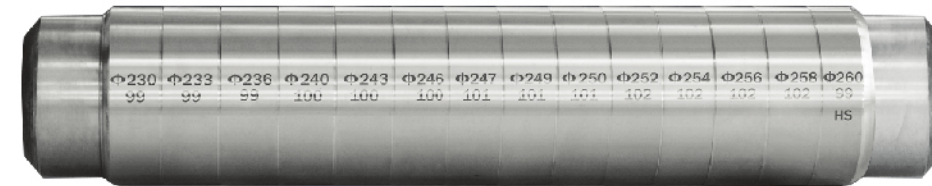
# PRODUCTS

- 1. 6-High HC Mill Work Rolls
- 2. 6-High HC Mill Intermediate Rolls
- 3. Tandem Cold Mill Rolls
- 4. Non-Ferrous Cold Mill Work Rolls
- 5. Roll Shafts
- 6. Backup rolls
- 7. Aluminum Foil Mill Backup rolls
- 8. Wide Aluminum Plate mill work rolls
- 9. High-precision Aluminum Foil Mill Work Rolls
- 10. Sendzimir Rolls



## HARDENING LAYER DEPTH FOR DIFFERENT MATERIALS OF MILL ROLLS

Roll Disassemble Experiment



# ROLL MATERIALS AND APPLICATION RANGE

## Application Range

Material	Hardness (HSD)	Cold Mill		Non-ferrous Strip & Foil Mill Work Rolls	Back-up Rolls	Multi-Roll Mill		Hot Mill Work Rolls	Roll shafts	Table Roller	Rolls for Battery Pole Flake
		Work Roll	Intermediate Roll			Work Roll	Intermediate Roll				
2%Cr	95-105			○							
	90-98	○				○					○
3%Cr	85-95	○				○					
	75-85		○			○					
5%Cr	50-80				○						
	50-60							○			
Cold Working Die Steel	75-95	○				○					
	75-85					○					
Hot Working Die Steel	75-85					○					
	60-75							○			
HSS	85-95	○				○					
	75-85							○			
Semi-HSS	85-95	○				○					
	75-85		○			○		○			
Alloy Structure Steel	40-55								○	○	

## Chemical composition of the cold mill WR,IMR and BUR

Roll Type	Grade	Material	Chemical Composition							
			C	Si	Mn	Cr	Ni	Mo	V	P
WR & IMR	2%Cr Series	9Cr2Mo	0.80-0.95	0.25-0.45	0.2-0.4	1.7-2.1	<0.25	0.2-0.4	/	≤0.02
		86CrMoV7	0.80-0.95	0.25-0.45	0.2-0.4	1.7-2.1	<0.25	0.2-0.4	0.1	≤0.02
	3%Cr Series	9Cr3Mo	0.75-0.95	0.25-0.45	0.2-0.55	2.5-3.5	/	0.2-0.3	/	≤0.02
		MC3	0.75-0.95	0.2-0.9	0.2-0.6	2.5-3.2	0.2-0.8	0.2-0.6	<0.25	≤0.02
BUR		YB-50	0.4-0.65	0.2-0.6	0.4-0.85	2.0-3.0	0.2-0.8	0.3-0.7	0.05-0.15	≤0.02
WR & IMR	5%Cr Series	MC5	0.7-0.95	0.2-0.9	0.2-0.6	4.5-5.4	0.1-0.8	0.1-0.6	<0.25	≤0.02
BUR		YB-70	0.4-0.85	0.3-0.7	0.4-0.80	4.5-5.5	0.2-0.8	0.3-0.8	0.05-0.2	≤0.02

## The property of the cold mill WR,IMR and BUR

Grade	Material	Mill	Roll Type	Specification
2%Cr	86CrMoV7	Single stand mill	WR	Depth 12~20mm
	86CrMoV7	Single stand mill	WR	Depth 12~20mm
	9Cr2Mo	Single stand mill	WR,IMR	Hardness Depth 10~15mm
3%Cr	MC3A	Single stand mill tandem mill	WR,IMR,	Ultra-deep Hardness Depth >25mm
	MC3	skin pass mill	WR	Hardness Depth >20 anti-roll mark
	YB-50	Single stand mill tandem mill	BUR	Hardness Depth 20~60mm
5%Cr	MC5	Single stand mill tandem mill	WR	Ultra-deep Hardness Depth ≥40mm
	MC5(A-H)	Single stand mill tandem mill	WR	high wear resistance. rollmark/uniformity
	YB-70	Single stand mill tandem mill	BUR	Hardness Depth 50-100mm



# ROLL MATERIALS AND APPLICATION RANGE

## Chemical composition of the Cluster Mill Rolls

Roll Type	material	Chemical Composition % Wt									
		C	Si	Mn	P	S	Cr	Mo	W	V	Co
WR	Cr12MoVCo	1.40-1.6	≤0.6	≤0.6	≤0.025	≤0.015	11.00-13	0.80-1.2	—	0.70-1	0.35-0.5
	Cr12Mo1V1 (D2/ SKD11)	1.45-1.65	≤0.4	≤0.6	≤0.025	≤0.015	11.00-13	0.70-1.1	—	0.7-1.1	—
	W6Mo5Cr4V2 (M2)	0.80-0.9	0.20-0.45	0.15-0.4	—	≤0.015	3.80-4.4	4.50-5.5	5.50-6.75	1.75-2.2	—
	8%Cr	1	0.7	0.5	≤0.025	—	8	2	—	1.2-1.5	—
IMR	4Cr5WMoSiV (H12/SKD62)	0.38-0.45	0.80-1.2	0.20-0.5	≤0.025	≤0.015	4.80-5.5	1.00-1.5	1.00-1.5	0.30-0.6	—
	X63CrMoV51	0.60-0.65	0.80-1.2	0.30-0.5	≤0.030	≤0.020	5.00-5.5	1.00-1.3	—	0.25-0.35	—
	5H12	0.48-0.55	0.80-1.2	0.20-0.5	≤0.025	≤0.015	4.80-5.5	1.00-1.5	1.00-1.5	0.30-0.6	—
	SHSS	0.72-0.8	0.80-1.05	0.25-0.45	≤0.02	≤0.015	4.80-5.2	1.00-1.2	—	0.40-0.6	—

## The Properties of Cluster Mill Rolls

Roll Type	Grade	Material	Performance Characteristics	Barrel Hardness	Apply to	Hardness Depth
WR	12%Cr	Cr12Mo1V1Co	High wear resistance, resistance to accident	62-64	Stainless steel, silicon steel	Whole diameter hardening/surface quenching
		Cr12Mo1V1 (D2)	The better wear resistance	61-63	Stainless steel	
IMR	Hot mould steel series	H13	High basis resistance	58-60	Stainless steel	
		5H12	The better wear resistance	58-60	Stainless steel, silicon steel	





# MARKET & SERVICE

TSR has its service specialists in many countries and regions. The company provides an comprehensive after-sales service and it is guaranteed that the service specialists will response in 24 hours, based on customers' problems. In the meantime, all kinds of roll products supplied by our company enjoy a wholelife-cycle quality assurance.

## Distribution of Customers

- India
- Turkey
- Iran
- Taiwan
- Egypt
- Russia
- Sri Lanka
- Malaysia
- Saudi Arabia
- Spain
- Morocco
- Chile
- France
- Mexico

## Service center

- Spain / Bilbao
- Argentina / Buenos Aires
- India / Calcutta
- Russia / Moscow
- Turkey / Istanbul
- Egypt / Cairo
- Pakistan / Islamabad
- Taiwan / Kaohsiung City
- Iran / Teheran
- Brazil / Timoteo
- Mexico / Monclova

## Distribution of Customers & Service Center

