



CIMM GROUP CO., LTD.

H.O. Add.: Floor 17 Chengda Building, No.71 Renmin Road,
Zhongshan District, Dalian-116001, China.
Tel: +86 411 82511023/25/26/27 Fax: +86 411 8251022/21
E-mail: cola@cimmuk.com, markma@cimmuk.com
Website: www.cimmuk.com

Advanced Technology +
Energy Saving + Global Service
CIMM GROUP CO., LTD.

CONTENTS

1	Message from Chairman	01
2	About Us	03
3	Production and Inspection	05
4	Product List	11



COMMITTED TO BE
A FOREVER TRUSTWORTHY
BUSINESS PARTNER

MESSAGE FROM CHAIRMAN

CIMM is endeavoring to become a first-class conglomerate globally based on integration of technology, engineering, manufacturing, trade and logistics through the collective power of peace, love and friendship.

CIMM follows the principle of equality, love, mutual-benefit and cooperation, embraces the mind of universal caritas, brilliant wisdom and hard work, spreads the seeds of friendship and irrigates the flower of peace during the course of providing its service to customers home and abroad.

CIMM is willing to join hands, go and grow together with its friends around the world.

CIMM is willing to share the progress and prosperity with its business partners around the world.



QPR is the fundamental guideline, principle and way for CIMM family to live, work, grow and create a new life and new future.



ABOUT US

CIMM roll manufacturing plant is founded in 2008, covers a land of 100,000 sq. meters. We are engaging in producing various metallurgical Rolls used for the modern cold and hot rolled strip tandem mills, medium-wide thick strip mills, profile steels, bars, high speed wiring rolling mills and medium-thin strip mills.

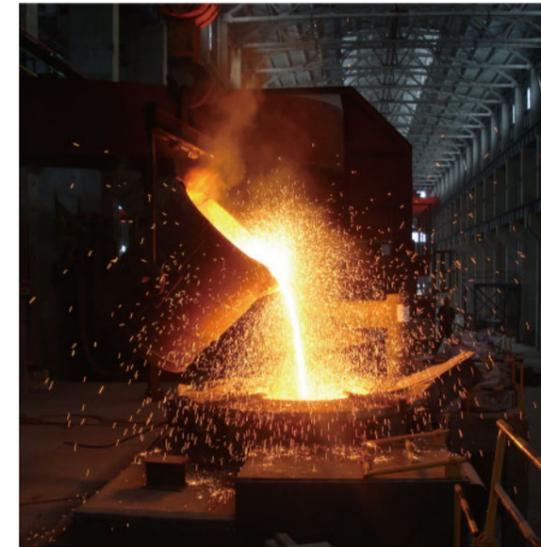
With the spirit of QPR (Quality, performance, Reputation), we are equipped ourselves with the advanced production, inspection and test equipments, including 8 medium frequency furnaces imported from USA, 1 arc furnace, 1 ladle furnace, 1 VD vacuum refining furnace and VC vacuum pouring furnace, 3 centrifugal casting machines, 18 high and low temperature resistance furnaces, 2 quenching furnaces, various NC processing lathes, as well as the Ultrasonic flaw detector, front-view metallurgical phase microscope, metallographic

image analyzer, carbon-sulfur analyzer, hydrogen, oxygen and nitrogen analyzer, metallurgical phase hardometer, dilatometer, scanning electron microscope, thermal analyzer, direct-reading spectrometer, Brinell hardness meter, Rockwell apparatus, profile sand tester, profile sand hardness gauge, profile sand coating thickness gauge, tension test machine, impact test machine and etc. Meanwhile we establish perfect product quality assurance system and have been granted the ISO9001:2008 quality management system certification.

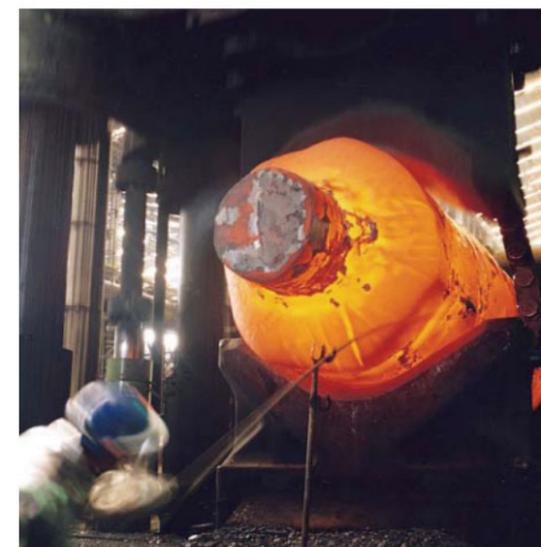
CIMM roll manufacturing plant has an excellent working team which consists of more than 350 experienced employees, in which 5 senior engineers at the professor level, 8 senior engineers. So far we have established strategic relationship with renowned metallurgical R&D institute in China for technical collaboration.

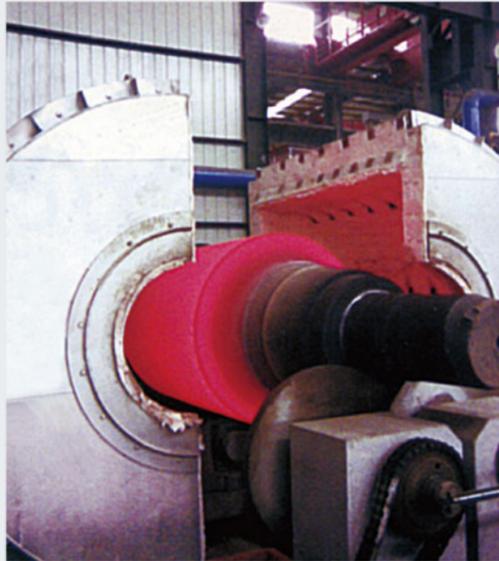
Casting of Rolls

We adopt conventional casting, grooved mould casting and centrifugal casting (horizontal/vertical) methods for roll production. Major facilities are 8 medium-frequency furnaces with capacity of 20t/30t, 10t, 5t, 3t, 30t arc furnace, 60t VD, etc. The major production process adopts advanced computer control technology and the system is automatically controlled, which ensure consistency of process control and stability of quality.



Forging of Rolls





Thermal Treatment of Rolls

The main equipments for thermal treatment are 30 sets of NC resistance-type high and low temperature heat treatment furnaces, quenching equipments, open-type differential temperature heat treatment furnaces and gas baking oven. The production process adopts computer centralized control system to control the consistent and proper temperature of the furnace strictly to ensure the mechanical properties and quality requirements of the various products.



Machining of Rolls

We are equipped with following machine tools: over 20 sets of large NC machine tools, such as large imported NC grinding machine, large/medium NC lathe, large/medium NC gantry double-face milling machine, as well as over 100 sets of various lathes, such as C61250, C61200, C61125, C84180, C84160, C8463, C8440, C91250, etc. Advanced high-accuracy machine tools plus experienced turning technique and control technology meet high machining accuracy and technical requirement of various products.



Packing



Test and Inspection of Rolls

We establish the perfect quality monitoring and inspection system, covering the full process from raw materials to the finished rolls. With the professional technician and advanced inspection and test equipments, we set up material analysis center, physical test center, quality control and inspection are carried out by: Leco CS230 carbon-sulfur analyzer, Leco Teco TCH-600 hydrogen, oxygen and nitrogen analyzer, direct-reading spectrometer, universal material testers, impact testers, Brill & Rockwell hardness meter, DM2500M front-view metallurgical phase microscope, DM6000M metallographic image analyzer, thermal dilatometer, ultrasonic flaw detect, etc. most of the equipments are imported from USA, Germany and Japan. The inspection instrument are computerized for acquiring information and feed back processing, which ensures the quality control and provides advanced means for technical research and development.



Product list

Casting roll

Cast iron roll

- Alloy indefinite Chilled cast iron rolls
- Alloy chilled cast iron roll
- Alloy graphite roll
- Pearlitic nodular cast iron roll
- Bainitic nodular cast iron roll
- High chrome cast iron centrifugal

Cast steel roll

- Alloy cast steel roll
- Adamite roll
- Graphite steel roll
- High chrome steel roll
- High-speed steel roll

Forged Cold Rolling Mill Roll

- 1) Forged work roll and intermediate rolls for cold rolling mill
- 2) Forged Back-up roll of cold and hot strip mills



Cast Iron Roll

1. Alloy indefinite chilled cast iron rolls

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
Nickel-chromium-molybdenum indefinite chilled cast iron roll	IC	3.1-3.4	0.6-0.9	0.5-1.0		0.7-1.1	0.2-0.6	50-70	35-55	> 160
Nickel-chromium-molybdenum indefinite chilled cast iron roll (I)	IC I	3.1-3.4	0.6-0.9	0.5-1.0	0.6-0.8	0.7-1.1	0.2-0.6	55-72	35-55	> 160
Nickel-chromium-molybdenum indefinite chilled cast iron roll (II)	IC II	3.1-3.4	0.6-1.0	0.5-1.0	2.2-2.8	0.7-1.1	0.2-0.6	55-72	35-55	> 160
Nickel-chromium-molybdenum indefinite chilled cast iron roll (III)	IC III	3.1-3.4	0.6-1.0	0.5-1.0	2.2-2.8	0.8-1.3	0.2-1.0	65-78	35-55	> 350
Nickel-chromium-molybdenum indefinite chilled cast iron roll (IV)	IC IV	3.1-3.4	0.6-1.0	0.5-1.0	3.1-4.3	1.0-1.3	0.2-1.0	70-83	35-55	> 350
Nickel-chromium-molybdenum indefinite chilled cast iron roll (V)	IC V	3.1-3.4	0.8-1.2	0.5-1.0	3.8-4.5	1.4-2.0	0.2-1.2	77-82	35-55	> 350

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
Nickel-chromium-molybdenum indefinite chilled cast iron roll	IC	Pearlite+Cementite+A small amount of graphite	Profile material, Rod-wire material, Narrow strip steel rolling mill intermediate rolling, finishing rolling stand
Nickel-chromium-molybdenum indefinite chilled cast iron roll (I)	IC I	Nodular pearlite+Cementite+A small amount of graphite	Profile material, Rod-wire material, Narrow strip steel rolling mill intermediate rolling, finishing rolling stand
Nickel-chromium-molybdenum indefinite chilled cast iron roll (II)	IC II	Nodular pearlite+Cementite+A small amount of graphite	Profile material, Rod-wire material, Narrow strip steel rolling mill intermediate rolling, finishing rolling stand
Nickel-chromium-molybdenum indefinite chilled cast iron roll (III)	IC III	Sorbite+Cementite+A small amount of graphite	Profile material, Rod-wire material, Narrow strip steel rolling mill intermediate rolling, finishing rolling stand
Nickel-chromium-molybdenum indefinite chilled cast iron roll (IV)	IC IV	Empered sorbite+Bainite+Carbonide+Graphite Or Bainite + A small amount of martensite + Carbonide + Graphite	Profile material, Rod-wire material, narrow strip steel rolling mill finishing stand, Mid-thickness plate, Levelling machine stand, Strip steel finishing rolling
Nickel-chromium-molybdenum indefinite chilled cast iron roll (V)	IC V	Empered sorbite+Bainite+Carbonide+Graphite Or Bainite + A small amount of martensite +Carbonide+Graphite	Mid-thickness plate, Levelling machine stand, Strip steel finishing rolling

Manufacturing specifications: Roll diameter ≤ 1400mm Roll length ≤ 4600mm

2. Alloy chilled cast iron rolls

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
NiCrMo chilled cast iron roll (I)	CC I	3.0-3.4	0.3-0.8	0.2-1.0	0.5-1.0	0.2-0.6	0.2-0.6	60-70	32-50	> 150
NiCrMo chilled cast iron roll (II)	CC II	3.0-3.4	0.3-0.8	0.2-1.0	1.1-2.0	0.3-1.2	0.2-0.6	62-75	35-52	> 150
NiCrMo chilled cast iron roll (III)	CC III	3.0-3.4	0.3-0.8	0.2-1.0	2.1-3.0	0.5-1.5	0.2-0.6	65-80	32-45	> 350
NiCrMo chilled cast iron roll (IV)	CC IV	3.0-3.4	0.3-0.8	0.2-1.0	3.1-4.0	0.5-1.7	0.2-0.6	70-85	32-45	> 350

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
NiCrMo chilled cast iron roll (I)	CC I	Pearlite+Cementite	Profile material, Rods and bars, Wire rod rolling mill and narrow strip steel rolling mill finishing stand
NiCrMo chilled cast iron roll (II)	CC II	Nodular pearlite+Cementite	Profile material, Rods and bars, Wire rod rolling mill and narrow strip steel rolling mill finishing stand
NiCrMo chilled cast iron roll (III)	CC III	Nodular pearlite+Cementite	Profile material, Rods and bars, Wire rod rolling mill and narrow strip steel rolling mill finishing stand
NiCrMo chilled cast iron roll (IV)	CC IV	Sorbite+Cementite	Profile material, Rods and bars, Wire rod rolling mill and narrow strip steel rolling mill finishing stand

Manufacturing specifications: Roll diameter ≤ 500mm Roll length ≤ 1000mm

3. Alloy graphite roll

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
Chrome-molybdenum indefinite chilled nodular cast iron roll	SG II	3.0-3.4	1.4-1.9	0.2-0.8		0.2-0.6	0.2-0.6	≥0.04	50-70	35-55	> 320
Chrome-molybdenum indefinite chilled nodular cast iron roll (I)	SG IV	3.0-3.4	1.4-1.9	0.4-0.8	0.5-1.0	0.2-0.6	0.2-0.6	≥0.04	55-70	35-55	> 320
Chrome-molybdenum indefinite chilled nodular cast iron roll (II)	SG V	3.0-3.4	1.4-1.9	0.4-0.8	1.1-2.0	0.3-1.0	0.2-0.6	≥0.04	60-70	35-55	> 320

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
Chrome-molybdenum indefinite chilled nodular cast iron roll	SG II	Pearlite+Cementite+A small amount of graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand
Chrome-molybdenum indefinite chilled nodular cast iron roll (I)	SG IV	Pearlite+Cementite+A small amount of graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand
Chrome-molybdenum indefinite chilled nodular cast iron roll (II)	SG V	Nodular pearlite+Cementite+A small amount of graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 3000mm

4. Pearlitic nodular cast iron roll

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
Pearlitic nodular cast iron roll I	SGP I	3.0-3.4	1.4-1.9	0.4-0.8	1.5-2.0	0.2-0.6	0.2-0.6	≥0.04	45-55	35-55	> 450
Pearlitic nodular cast iron roll II	SGP II	3.0-3.4	1.2-2.0	0.4-0.8	2.01-2.5	0.2-1.0	0.2-0.6	≥0.04	55-65	35-55	> 450
Pearlitic nodular cast iron roll III	SGP III	3.0-3.4	1.0-2.0	0.4-0.8	2.51-3.0	0.2-1.2	0.2-0.6	≥0.04	62-72	35-55	> 450

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
Pearlitic nodular cast iron roll I	SGP I	Pearlite+Cementite+A small amount of graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand
Pearlitic nodular cast iron roll II	SGP II	Pearlite+Cementite+A small amount of graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand
Pearlitic nodular cast iron roll III	SGP III	Pearlite+Carbonide+Spheroidal graphite Or Pearlite + A small amount of bainite + Carbonide + Spheroidal graphite	Profile material, Rods and bars, Wire rod and narrow strip steel rolling mill set, intermediate rolling stand

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 3000mm

5. Bainitic nodular cast iron roll

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
Bainitic nodular centrifugal compound cast iron roll I	SGA I	3.0-3.4	1.2-2.2	0.4-0.8	3.01-3.5	0.2-0.8	0.5-1.0	≥0.04	55-78	32-45	> 350
Bainitic nodular centrifugal compound cast iron roll II	SGA II	3.0-3.4	1.0-2.0	0.4-0.8	3.51-4.5	0.2-1.0	0.5-1.0	≥0.04	60-80	32-45	> 350

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
Bainitic nodular centrifugal compound cast iron roll I	SGA I	Bainite +A small amount of martensite + Carbonide+Graphite	Profile material, Rods and bars, Wire rolling mill Rough rolling, Intermediate rolling, Pre-finishing mill stand; Seamless steel tube tandem mill microtension reducing-sizing stand
Bainitic nodular centrifugal compound cast iron roll II	SGA II	Bainite +A small amount of martensite + Carbonide+Graphite	Profile material, Rods and bars, Wire rolling mill Rough rolling, Intermediate rolling, Pre-finishing mill stand; Seamless steel tube tandem mill microtension reducing-sizing stand

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 3000mm

6. High chrome cast iron centrifugal roll

Chemical composition and physical features

Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
High chrome cast iron centrifugal roll I	HCr I	3.0-3.3	0.3-1.0	0.5-1.2	0.7-1.7	12-15	0.7-1.5		60-75	32-45	> 350
High chrome cast iron centrifugal roll II	HCr II	3.0-3.3	0.3-1.0	0.5-1.2	0.7-1.7	15.01-18	0.7-1.5		65-80	35-45	> 350
High chrome cast iron centrifugal roll III	HCr III	3.0-3.3	0.3-1.0	0.5-1.2	0.7-1.7	18.01-22	1.51-3		75-90	32-45	> 350

Metallurgical structure and Range of application

Roll name	Material code	Metallurgical structure	Application
High chrome cast iron centrifugal roll I	HCr I	Tempered martensite + Carbonide + carbide	Profile material, Rods and bars, Wire rod rolling mill finishing stand; Hot strip tandem rolling rough rolling, Working roll in the front part of finishing rolling mill, Working roll for wide/mid-thickness plate rolling mill;
High chrome cast iron centrifugal roll II	HCr II	Tempered martensite + Carbonide tempered martensite+carbide	Profile material, Rods and bars, Wire rod rolling mill finishing stand; Hot strip tandem rolling rough rolling, Working roll in the front part of finishing rolling mill, Working roll for wide/mid-thickness plate rolling mill;
High chrome cast iron centrifugal roll III	HCr III	Bainite + A small amount of martensite + Carbonide	Profile material, Rods and bars, Wire rod rolling mill finishing stand; Hot strip tandem rolling rough rolling, Working roll in the front part of finishing rolling mill, Working roll for wide/mid-thickness plate rolling mill;

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 4300mm

Cast Steel Roll

1. Alloy cast steel roll

Chemical composition and physical features										
Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
Zu60CMoMn	AS60	0.55-0.65	0.2-0.45	0.9-1.2		0.8-1.2	0.2-0.45	35-50	≤45	>650
Zu 60CrMoMnNi	AS60 I	0.55-0.65	0.2-0.6	0.5-1.0	0.2-1.5	0.8-1.2	0.2-0.6	35-45	≤45	>750
Zu65CrNiMo	AS65 I	0.6-0.7	0.2-0.6	0.5-0.8	0.2-0.5	0.8-1.2	0.2-0.45	35-45	≤45	>750
Zu70Mn	AS70	0.65-0.75	0.2-0.45	0.8-1.4				32-42	≤45	>650
Zu70Mn2	AS70 I	0.65-0.75	0.2-0.45	1.4-1.8				35-45	≤45	>680
Zu70Mn2Mo	AS70 II	0.65-0.75	0.2-0.45	1.4-1.8			0.2-0.45	35-45	≤45	>700
Zu75CrMo	AS75	0.7-0.8	0.2-0.45	0.6-0.9		0.75-1.0	0.2-0.45	35-50	≤45	>700
Zu75CrNiMnMo	AS75 I	0.7-0.8	0.2-0.7	0.7-1.1	≥0.2	0.8-1.5	0.2-0.6	35-50	≤45	>800

Metallurgical structure and Range of application			
Roll name	Material code	Metallurgical structure	Hardness of roll body HSD
Zu60CMoMn	AS60	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu 60CrMoMnNi	AS60 I	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu65CrNiMo	AS65 I	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu70Mn	AS70	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu70Mn2	AS70 I	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu70Mn2Mo	AS70 II	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling
Zu75CrMo	AS75	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling, Narrow strip steel support roll
Zu75CrNiMnMo	AS75 I	Working layer on roll body is: Pearlite or Tempered sorbite	Rods and bars, Wire material, Strip steel, plate strip, Profile steel rough rolling, Narrow strip steel support roll

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 3000mm

2. Alloy chilled cast iron rolls

Chemical composition and physical features										
Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
ZuB140CrNiMo	AD 140 I	1.3-1.5	0.3-0.6	0.7-1.1	0.5-1.2	0.8-1.2	0.2-0.6	35-50	≤60	500-800
ZuB160CrNiMo	AD 160 I	1.5-1.7	0.3-0.6	0.8-1.3	≥0.2	0.8-2.0	0.2-0.6	40-60	≤50	500-800
ZuB180CrNiMo	AD 180	1.7-1.9	0.3-0.8	0.6-1.1	0.2-2.0	0.8-1.5	0.2-0.6	45-60	≤50	450-700
ZuB190CrNiMo	AD 190	1.8-2.0	0.3-0.8	0.6-1.2	1.0-2.0	1.5-3.5	0.2-0.5	50-65	≤50	450-700
ZuB200CrNiMo	AD 200	1.9-2.1	0.3-0.8	0.8-1.2	0.6-2.5	0.6-2.0	0.2-0.8	50-65	≤50	450-700

Metallurgical structure and Range of application			
Roll name	Material code	Metallurgical structure	Application
Zu60CMoMn	AD 140 I	Working layer on roll body is: Pearlite + Carbonide or Nodular pearlite + A small amount of martensite + Carbonide	Rods and bars, Wire material, Profile steel, Plate strip rough rolling, Vertical roll
Zu 60CrMoMnNi	AD 160 I	Working layer on roll body is: Pearlite + Carbonide or Nodular pearlite + A small amount of martensite + Carbonide	Rods and bars, Wire material, Profile steel, Plate strip rough intermediate rolling, Vertical roll, Roll collar, Support roll
Zu65CrNiMo	AD 180	Working layer on roll body is: Pearlite + Carbonide or Nodular pearlite + A small amount of martensite + Carbonide	Rods and bars, Wire material, Profile steel, Plate strip rough intermediate rolling, Vertical roll, Roll collar, Support roll
Zu70Mn	AD 190	Working layer on roll body is: Pearlite + Carbonide or Nodular pearlite + A small amount of martensite + Carbonide	Rods and bars, Wire material, Profile steel, Plate strip rough intermediate rolling, Vertical roll, Roll collar, Support roll
Zu70Mn2	AD 200	Working layer on roll body is: Pearlite + Carbonide or Nodular pearlite + A small amount of martensite + Carbonide	Rods and bars, Wire material, Profile steel, Plate strip rough intermediate rolling, Vertical roll, Roll collar, Support roll

Manufacturing specifications: Roll diameter ≤ 1800mm Roll length ≤ 3000mm

3. Pearlitic nodular cast iron roll

Chemical composition and physical features										
Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
ZuS140CrNiMo	GS140	1.3-1.5	1.3-1.6	0.5-0.8		0.4-0.7	0.2-0.5	36-46	≤46	≥540
ZuS160CrNiMo	GS160	1.5-1.7	0.8-1.5	0.6-1.0	0.2-1.0	0.5-1.5	0.2-0.8	45-55	≤50	≥500
ZuS190CrNiMo	GS190	1.8-2.0	0.8-1.5	0.6-1.0	0.6-2.2	0.5-2.0	0.2-0.8	50-65	≤50	≥450

Metallurgical structure and Range of application			
Roll name	Material code	Metallurgical structure	Application
ZuS140CrNiMo	GS140	Working layer on roll body is: Pearlite + Spheroidal graphite + Carbonide	Intermediate-small-sized profile steel, Rod-wire rough rolling mill, Hot-rolling strip steel shaping roll, Roll cover of universal rolling mill
ZuS160CrNiMo	GS160	Working layer on roll body is: Pearlite + Spheroidal graphite + Carbonide	Intermediate-small-sized profile steel, Rod-wire rough rolling mill, Hot-rolling strip steel shaping roll, Roll cover of universal rolling mill
ZuS190CrNiMo	GS190	Working layer on roll body is: Pearlite + Spheroidal graphite + Carbonide	Intermediate-small-sized profile steel, Rod-wire rough rolling mill, Hot-rolling strip steel shaping roll, Roll cover of universal rolling mill

Manufacturing specifications: Roll diameter ≤ 1800mm Roll length ≤ 3000mm

4. High chrome steel roll

Chemical composition and physical features										
Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
CS	HCrS	1.0-1.8	0.4-1.0	0.5-1.0	0.5-1.5	8.0-15.0	1.5-4.5	70-85	35-45	≥450

Metallurgical structure and Range of application			
Roll name	Material code	Metallurgical structure	Application
CS	HCrS	Working layer on roll body is: Tempered sorbite or martensite + Carbonide	Hot-rolling strip steel rough rolling, Working roll in the front part of finishing rolling mill, Working roll for wide/mid-thickness rolling mill, Mill roll of universal rolling mill for profile steel

Manufacturing specifications: Roll diameter ≤ 1500mm Roll length ≤ 3000mm

5. High-speed steel roll

Chemical composition and physical features												
Roll name	Material code	C	Si	Mn	Ni	Cr	Mo	V	W	Hardness of roll body HSD	Hardness of roll neck HSD	Tensile strength Mpa
HSS	HSS	1.5-2.2	0.3-1.0	0.4-1.2	0.0-1.5	3.0-8.0	2.0-8.0	2.0-9.0	0.0-2.0	75-95	30-45	400-500
S-HSS	S-HSS	0.6-1.2	0.8-1.5	0.5-1.0	0.2-1.2	3.0-9.0	2.0-5.0	0.4-3.0	0.0-3.0	75-98	30-45	400-500

Metallurgical structure and Range of application			
Roll name	Material code	Metallurgical structure	Application
HSS	HSS	A small amount of tempered martensite + Carbide + Carbon	Rolled strip, bar finishing roller, high speed wire pre-finishing, steel roller universal rolling mill, wide plate mill work rolls
S-HSS	S-HSS	A small amount of tempered martensite + Carbide + Carbon	Rough rolling hot strip mill work rolls, cold rolled strip steel work roll, intermediate roll

Manufacturing specifications: Roll diameter ≤ 1000mm Roll length ≤ 3000mm

Forged Cold Rolling Mill Rolls

Typical Chemical Analysis

Forged work roll and intermediate rolls for cold rolling mill						
Material	C	Mn	Cr	Mo	V	Ni
86CrMoV7	0.82-0.88	0.32-0.50	1.50-2.20	0.20-1.0	0.10-0.40	≤0.60
9Cr2Mo	0.85-0.95	0.20-0.60	1.50-2.50	0.20-1.0	-	≤0.60
3%Cr	0.75-0.95	0.20-0.60	2.50-3.50	0.20-1.0	-	≤0.60
3%CrA	0.70-0.90	0.30-0.80	2.50-3.50	0.40-1.0	0.10-0.40	0.60-1.0
5%Cr	0.70-0.90	0.20-0.50	4.50-5.50	0.20-1.0	0.10-0.40	0.60-1.0

Forged Back-up roll of cold and hot strip mills						
Material	C	Mn	Cr	Mo	V	Ni
3%Cr	0.40-0.70	0.40-0.80	2.80-3.20	0.20-0.40	0.10-0.20	0.25-0.60
5%Cr	0.40-0.70	0.40-0.80	5.00-5.40	0.30-0.50	0.10-0.20	0.25-0.60

Typical Mechanical Properties				
Type of cold rolls	Tensile strength	Depth of hardness	Hardness of neck	Hardness of Barrel
Cr2 Series	≥800	12-18	40-55	Work roll:90-98 Intermediate roll:80-90 Back-up roll:55-75 Temper roll:95-100
Cr3 Series	≥900	20-28	40-55	
Cr5 Series	≥1000	25-40	40-55	

The scope of supply				
Type of cold rolls	Material	Body length	Body Diameter	Overall length
Cold-rolling work rolls	Cr2, Cr3, Cr5	≤2500	≤800	≤5000
Cold-rolling intermediate rolls	Cr2, Cr3, Cr5	≤2500	≤1000	≤5000
Cold-rolling back-up rolls	Cr3, Cr5	≤2800	≤1800	≤8000
Cold-rolling temper rolls	Cr2, Cr3, Cr5	≤2500	≤800	≤5000



Roll Ring

