



250, Sec. 23 – A, (Near Dashmesh Crane)
 Back Side of Cheema Petrol Pump, G.T. Road,
 Mandi Gobindgarh - 147 301,
 District – Fatehgarh Sahib, Punjab, (India)
 Cell No.: +91 7837800171 / 9316681123
 E-mail: santoshrolls@gmail.com / srmrolls@ammetalics.com
 Web: www.ammetalics.com

Committed to Principal of Technology, Quality, Commitment & Service.



A.M. METALICS PVT. LTD.

Manufacturer, Supplier & Exporter of Metal Rolls & Steel Rolling Mill's Machineries



ISO 9001:2008 CO.



From the Desk of Director

Respected Sir / Madam,

We are introducing our company "M/s. A.M. Metalics Pvt. Ltd." from North India in Punjab as a leading Manufacture, Supplier & Exporter of **Metal Rolls (Rolling Mill's Rolls)** to all types of Steel Rolling Mills. Our main goal is perfect entire solution in minimum cost to our valuable customers by **Principle of Technology, Quality, Commitment & Continues Service**. We are with Throughout team of Engineers, Skilled workers & Allied Professionals who have experience over many years in same field.

We have Quality Assurance Plan (Q.A.P.) to every step of Manufacturing's Process to the "characteristics" required to Metal Rolls (Rolling Mill's Rolls) like; **Good wear- resistance due to friction's load, A firm structure against breaking, Good mechanical-resistance even at temperature change, Good resistance against sudden heavy Impact, Bending & tensile load, Good resistance against thermal & fire-cracks on surface which due to contact with constant hot rolling materials. Good Machining ability.**

We are always involve in Research & Development (R&D) towards to get excellent performance by giving better pass-life with better polishing of end – Rolling Product according to change in infrastructure of rolling mills time to time as per need of modern & latest technology to stands in competition of domestic & export market. In this way our products becomes "Low Cost purchased" to our customers.

We are Manufacturing Forged / Cast Metal Rolls (Rolling Mill's Rolls) to Hot Steel Rolling Mills in entire Grades for all stands of Rolling Mill's, consisting of **300 Kgs to 15,000 Kgs.** in finished weight of single Roll which range of Barrel Dia starting from **300 mm to 1000 mm.** and Length of Rolls up-to 5 Meters.

At last you are warm requested to kindly give us an opportunity to serve you by our products & prove us our performance.

FOR A.M. METALICS PVT. LTD.

SANTOSH KUMAR SINGH

DIRECTOR

CONTACT NO.:- +91 9316681123 / 7837800171

E-MAIL:- santoshrolls@gmail.com / srmrolls@ammetalics.com

Web:- www.ammetalics.com

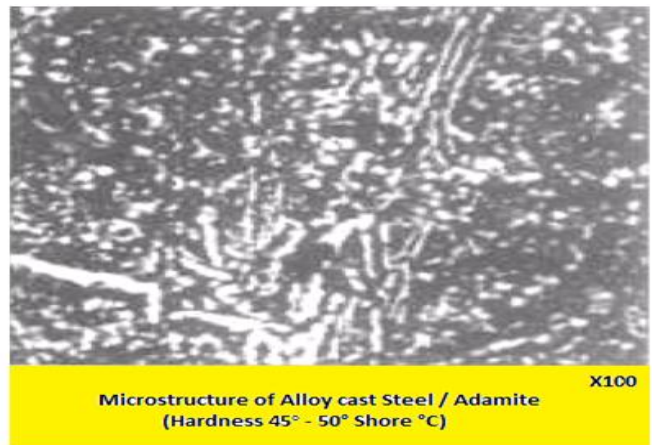
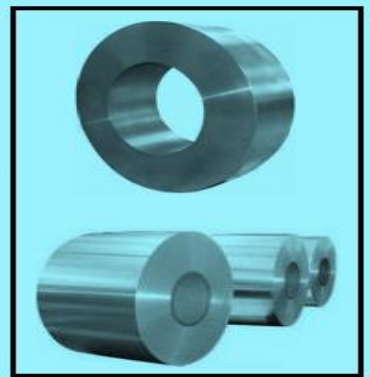
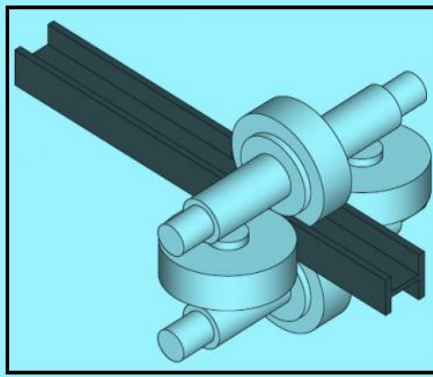
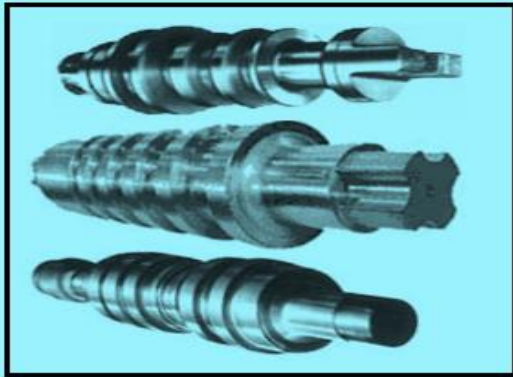
PRODUCTS RANGE OF METAL ROLLS (ROLLING MILL'S ROLLS)

From the house of A.M. Metalics Pvt. Ltd. Below product's range of Metal Rolls (Rolling Mill's Rolls) are available

- 1. Alloy Cast Steel/ Adamite Rolls & Rings.**
- 2. Graphitic / Graphitized Rolls.**
- 3. Spheroidal Graphite (Nodular) Cast Iron Rolls- S.G.I.-Ferritic, S.G.I. Pearlitic & S.G.I.-Bainitic Accicular.**
- 4. Alloy Indefinite Chilled Cast Iron Rolls & Rings (AICCI).**
- 5. Forged Steel Rolls, Shafts & Rings.**

- Alloy Cast Steel / Adamite Rolls, Reels and Rings:** Alloy Cast Steel Base Adamite Rolls are hypereutectoid steel of Pearlitic Microstructure (Pearlite + Carbides) which are produced from alloyed (**Mn, Cr, Ni & Mo**). These Rolls are subjected to sophisticated multi-stage high temperature Heat- Treatment by Double Annealing followed by tempering cycle to the best microstructure which is capable of a higher mechanical strength with thermal and wear resistance along with hardness in depth (Constant Hardness Curve).

Chemical Composition-Range:									Physical Properties:		
C%	Mn%	Si%	Cr%	Ni%	Mo%	V%	S%	P%	Hardness Range (Shore ° C)	Tensile Strength (N/mm ²)	Bending Resistance (N/mm ²)
0.50 2.00	0.50 1.20	0.20 0.80	1.00 2.00	0.50 2.00	0.20 0.80	0.10 0.60	0.040 Max	0.045 Max	30 °C to 60 °C	350 – 700	600 – 1100

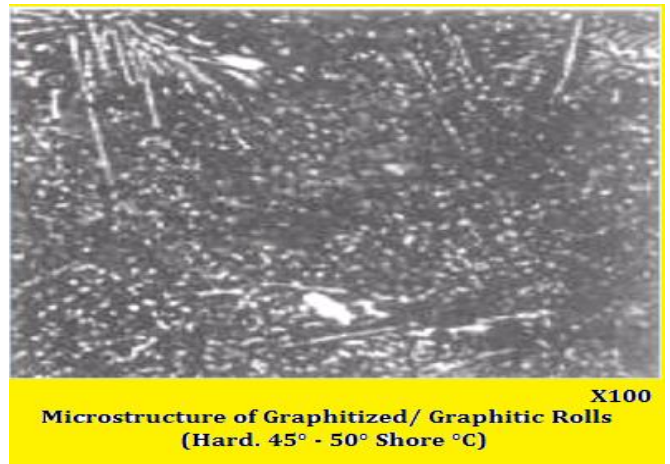
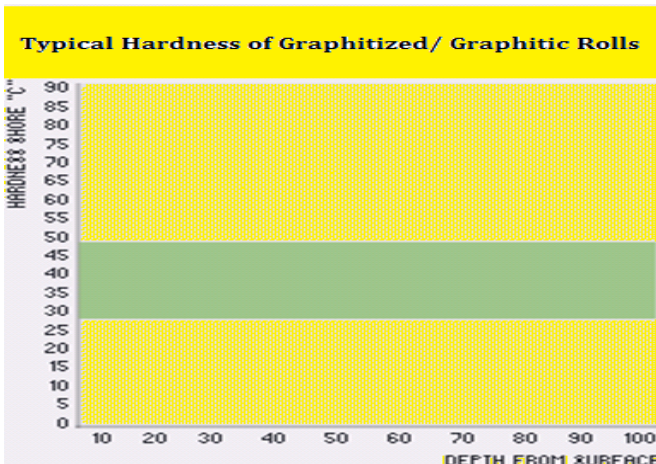
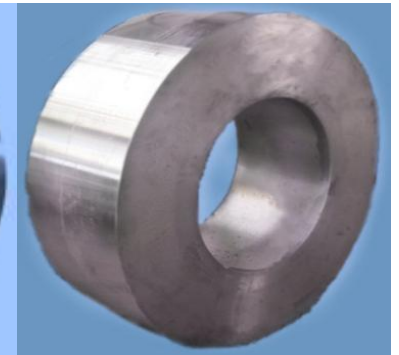
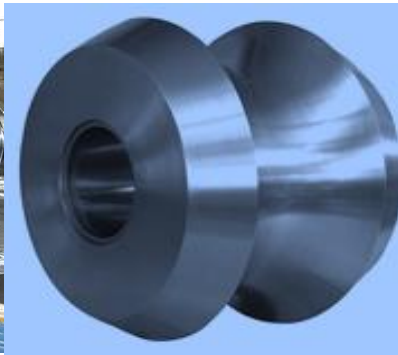


Application: Application of Alloy Cast Steel / Adamite is very suitable according to Hardness & Chemical Composition range as per below:

Rolling Mills	Mill- Type	Stands- Position	Pass- Condition
Heavy, Medium & Light Section, Beams, Rail & Bar Mills	2 & 3 Hi or Universal	In all stands (Rough, Intermediate & Finish)	In case deep or light groove pass, low reduction & low RPM.
Medium & Narrow Strip TMT & Wire Rod Mills	2 & 3 Hi	Only on Roughing Stand	
Heavy, Medium & Light Section Mills	Can be used for Straightening Rollers (Reels)		

2. **Graphitized / Graphitic Rolls, Reels & Rings:** Graphitic Steel Base Roll is similar to normal steel base but these rolls have the structure consists of Carbide in a Pearlritic matrix with free Graphite. Therefore, it is known as Graphitic Rolls. By modification of the alloy content and suitable heat treatment a controlled amount of fine graphite particles dispersed throughout the structure of the rolls are produced. These Rolls are greater than any other steel base Roll due to presence of the graphite improves the fire-crack resistance of the roll material and reduces thrust collar wear and the side wears which occurs during indirect heavy reduction ratio as well as better strength to thermal-crack along with no drop of hardness. However, the grade chosen for an application will have sufficient carbide in its structure to ensure that its wear resistance is high while the matrix structure can be either spheroid zed or lamellar Pearlite depending on the heat treatments.

Chemical Composition-Range:									Physical Properties:		
C%	Mn%	Si%	Cr%	Ni%	Mo%	V%	S%	P%	Hardness Range (Shore ° C)	Tensile Strength (N/mm ²)	Bending Resistance (N/mm ²)
1.30	0.70	0.50	1.00	0.80	0.20	0.10	0.045	0.045	50° C to 60° C	500-800	850-1300
2.50	1.25	1.50	2.00	3.00	0.80	0.60	Max	Max			



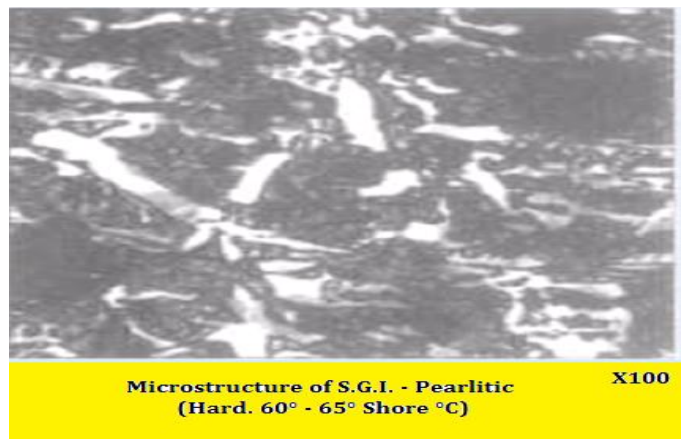
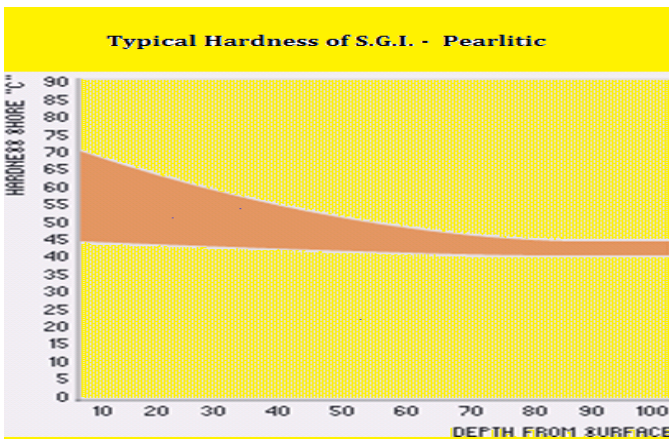
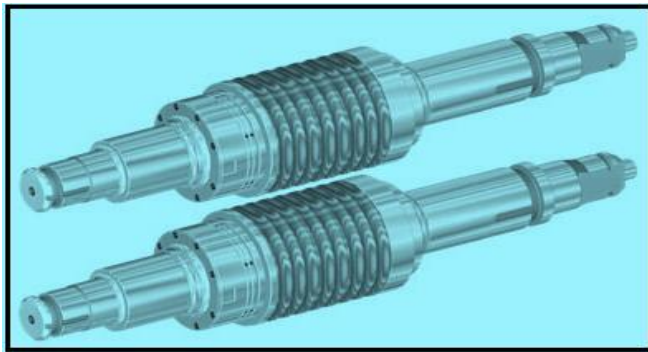
Application: Application of **Graphitic Steel Base** is very suitable according to Hardness & Chemical Composition range as per below:

Rolling Mills	Mill- Type	Stands- Position	Pass- Condition
Heavy Section, Medium Section, Light Section, Beams, Rail & Bar Mills	2 & 3 Hi or Universal	In all stands (Rough, Intermediate & Finish)	In case deep groove pass, Hi-reduction -ratio & Hi-thermal load
Medium & Narrow Strip TMT & Wire Rod Mills	2 & 3 Hi	Only on Roughing Stand	
Heavy, Medium & Light Section Mills	Can be used for Straightening Rollers (Reels)		

3. (A). Spheroidal Graphite (Nodular) Cast Iron Rolls-S.G.I.-Pearlitic:

These Rolls are structurally characterized by nodular graphite as against flake graphite by Nodularizing in the normal cast iron, Indefinite Chill type material, but with the Graphite in Nodular form instead of flake and having alloyed with higher percentage of Carbon along with Nickel & Molybdenum. So these rolls have a much higher Mechanical Strength and allow the use of an iron Rolls in applications which would re-present too high a duty for a flake iron quality due to internal 'notch effect' of nodular graphite is relatively small. These rolls are very much suitable for the rolling of row products with wide range of applications due to its hardness penetration; good wear resistance and tough necks.

Chemical Composition-Range:									Physical Properties:		
C%	Mn%	Si%	Cr%	Ni%	Mo%	Cu%	S%	P%	Hardness Range (Shore ° C)	Tensile Strength (N/mm ²)	Bending Resistance (N/mm ²)
3.00	0.30	1.20	0.50	1.50	0.30	0.20	0.015	0.10	50° C to 75° C	400 – 800	700 – 1350
3.60	0.70	2.50	1.20	2.50	1.00	Max	Max	Max			

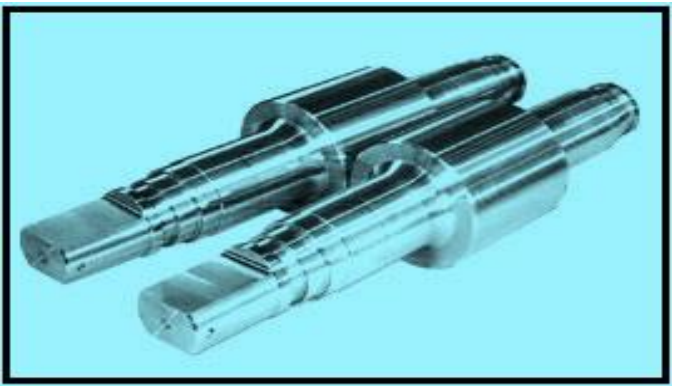
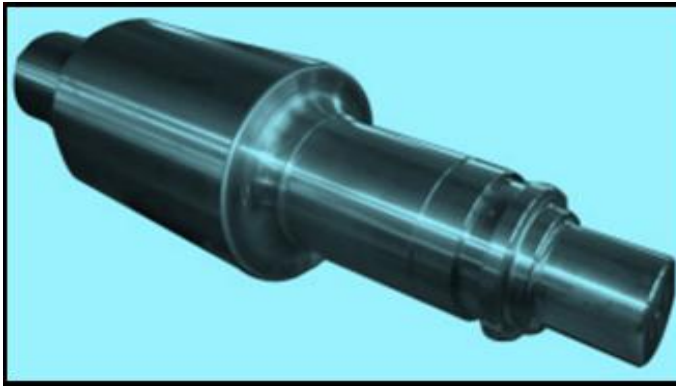


Application: Application of S.G.I.-Pearlitic is very suitable according to Hardness & Chemical Composition range as per below:

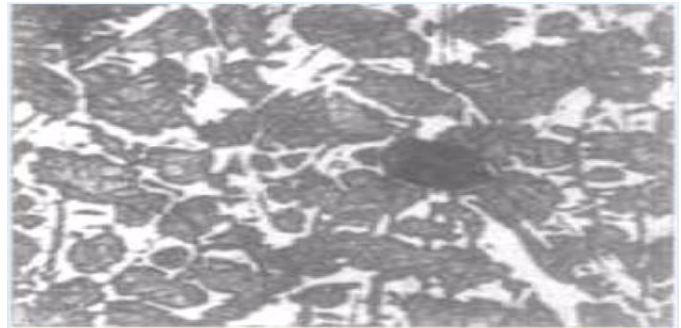
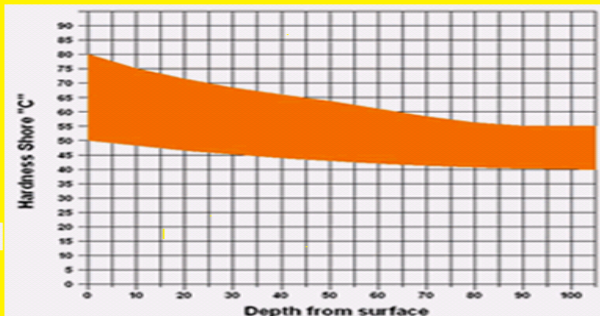
Rolling Mills	Mill- Type	Stands- Position	Pass- Condition
Plate, Sheet, Billet & Sheet Bar	2 & 3 Hi	Only on Finishing- stand	In case low reduction, light groove pass & low or high RPM as well as short rolling length.
TMT, Wire-rod, Medium & Light Section Mill		Roughing, Intermediate & Finishing- stand	
Round & Bar Mill		Intermediate & Finishing-stand	

3. **(B). Spheroidal Graphite (Nodular) Cast Iron Rolls- S.G.I.- Bainitic Accicular:** The structure consists of graphite nodules in the matrix of Bainitic. So these Rolls are stronger and more wear assistance with respect of S.G.I. Pearlitic Rolls and are capable of much higher hardness because S.G.I. Bainitic Accicular is more alloyed with very higher percentage of Nickel and Molybdenum than the S.G.I. Pearlitic and as a result, the Accicular roll material has a Bainitic matrix with increased carbide. The name of this material is based on its constituents of nodular graphite and carbides in an Accicular (needle-like) Bainitic matrix, also called Lower Bainitic. These Rolls become a benchmark in the rolling of long product and in suitable for a wide range of applications due to its hardness penetration; good wear assistance and tough necks.

Chemical Composition-Range:									Physical Properties:		
C%	Mn%	Si%	Cr%	Ni%	Mo%	Cu%	S%	P%	Hardness Range (Shore ° C)	Tensile Strength (N/mm ²)	Bending Resistance (N/mm ²)
3.00	0.30	1.20	0.60	2.50	0.50	0.20	0.015	0.10	50° C to 80° C	400 – 750	700 – 1100
3.70	0.80	2.00	1.20	4.00	1.20	Max	Max	Max			



Hardness of S.G.I. - Bainitic Accicular



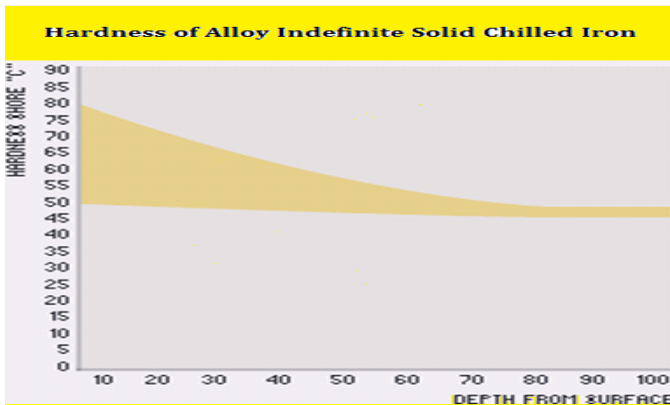
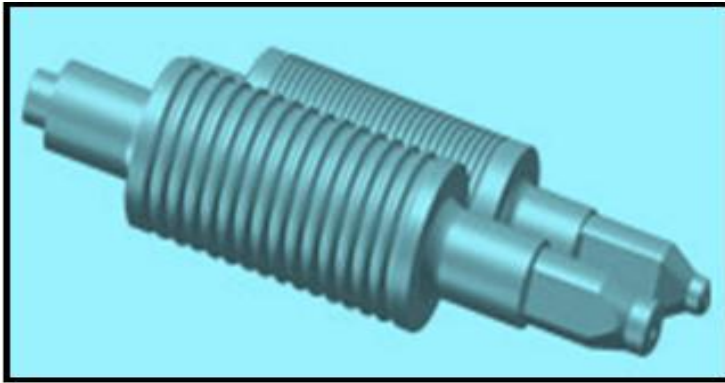
X100
Microstructure of S.G.I. - Bainitic Accicular
(Hard. 70° - 75° Shore °C)

Application: Application of S.G.I.- Bainitic Accicular is very suitable according to Hardness & Chemical Composition range as per below:

Rolling Mills	Mill- Type	Stands- Position	Pass- Condition
Sheet, Round, Bar, Medium & Light Section	2 & 3 Hi	Only on Finishing- stand	In case low or high RPM, Long or short rolling length with light groove pass & low reduction.
TMT & Wire-rod,		Intermediate & Finishing- stand	
Plate Mill	2, 3 & 4 Hi	Roughing to Finishing-stand	

4. **Alloy Indefinite Solid Chilled Iron Rolls & Reels:** Alloys Indefinite Chill Iron Rolls have a structure consisting of more flake graphite with few carbides in a Pearlitic matrix. Harder grades have a Bainitic-Martensitic matrix with an increased amount of carbides. The presence of flake graphite improves spalling resistance and also enhances resistance to fire cracking. All of these properties combined with the excellent surface finish make AIC Alloy Indefinite Chill very suitable for rolling flats sections and similar products where surface finish is critical. Due to alloy additions, hardness penetration is better than that of a clear chill roll and this material may be used in applications with deeper grooves such as small and medium section rolling and also for finishing billets.

Chemical Composition-Range:									Physical Properties:		
C%	Mn%	Si%	Cr%	Ni%	Mo%	Cu%	S%	P%	Hardness Range (Shore ° C)	Tensile Strength (N/mm ²)	Bending Resistance (N/mm ²)
3.00	0.50	0.50	1.00	1.00	0.50	0.20	0.080	0.10	50° C to 80° C	150 – 250	250 – 350
3.50	1.00	1.20	2.00	3.50	1.50	Max	Max	Max			

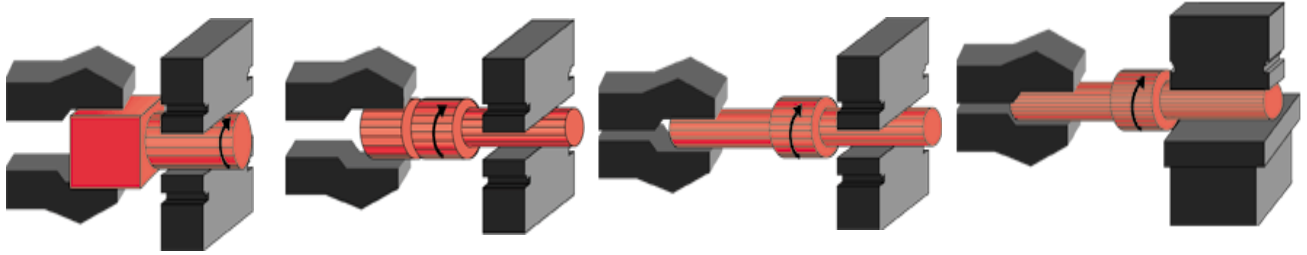


Application: Application of Alloy Indefinite Solid Chilled Iron Rolls according to Hardness range as per below:

Rolling Mills	Mill- Type	Stands- Position	Pass- Condition
Plate, Medium & Narrow Strip	2, 3 & 4 Hi	Roughing	In case of deep or light groove pass, low reduction & short or long rolling length.
Billet & Sheet Bar, Medium Section Mill & Flat	2 & 3 Hi	Intermediate & Finishing- stand	
TMT, Wire Rod, Round & Bar		Intermediate & Finishing- stand	

5. **Forged Steel Rolls, Shaft and Rings:** These are carbon steel and alloy steel Rolls and these are manufactured by metal is pressed, pounded or squeezed under great pressure into high strength by open die hot forgings. Preheating the metal to a desired temperature before it is worked normally performs the process hot.

Application: Application of Forged Steel Rolls can be used only on Roughing Stand in all types of Hot Steel Rolling Mills.



Grade	Chemical Composition – Range				
	C%	Mn%	Si%	S%	P%
EN 8 (Forged Steel)	0.35 0.45	0.60 1.00	0.15 0.30	0.045 Max	0.045 Max
EN 9 (Forged Steel)	0.50 0.60	0.60 0.80	0.15 0.30	0.045 Max	0.045 Max
EN 42 (Forged Steel)	0.70 0.80	0.55 0.75	0.10 0.40	0.045 Max	0.045 Max

PRODUCTION PROCESS

Manufacturing Process-line:

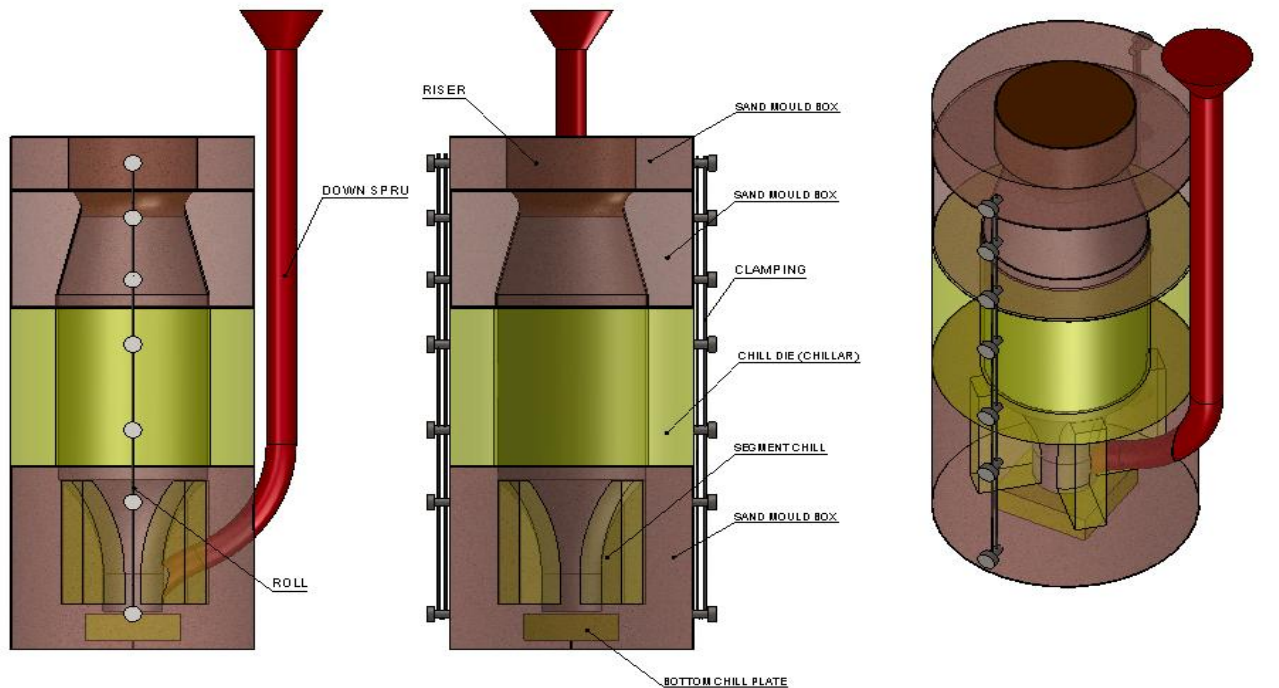
Melting: We are equipped with a range of coreless induction melting furnaces providing molten metal to produce castings of Metal Rolls. Some of these furnaces are of very recent installation incorporating the most sophisticated, state-of-the-art control equipment.



Casting: In depth experience of A.M. Metals Pvt. Ltd. technologists, together with unrivalled metallurgical facilities, allow the production of highest quality rolls which are precisely tailored to meet the exact demands of today's modern rolling mills by value addition to give extra effective Roll's life with required quality of end product of in Rolling Mills with reducing maintenance practice.



Moulding: Moulding of Metal Roll is done by 'Directional Solidification Static Method'. Mould of Metal Rolls carry out by vertical with tangential gate Bottom Pouring. Metal Rolls are Cast by conventional Roll founding techniques, using chills, sand lined chills or external denseness. A number of sand systems are in use incorporating modern preparation and reclamation processes.



CASTING METHOD :-

DIRECTIONAL SOLIDIFICATION STATICALLY TANGENTIAL GATE SINGLE BOTTOM POURING SYSTEM

	CHILL
	RISER
	METAL ROLL
	DOWN SPRUE
	CLAMPING

Heat-Treatment: We are applying Heat-Treatment Process by Multi Stage Controlled Temperature Cycle with Double Annealing followed by tempering cycle. Many of the qualities produced require being heat treated to achieve the optimum physical properties for the application for which they are intended.



Machining: A.M. Metalics Pvt. Ltd. has extensive workshops equipped with full range of machine tools necessary to provide the high standard of dimensional precision and surface finish so essential for modern Mill's Rolls. We having facilities to both of scope Proof Machined as well as Finish Machined condition like Fiber Wobbler making, Neck-Grinding and Bearing-Size making.



Inspection and Testing: Strict quality control is maintained throughout the production of a roll, in the selection of raw materials, melting, casting, heat treatment and machining. During production and before the final dispatch of the roll, non-destructive and hardness tests are carried out. In addition, samples are routinely removed for the monitoring of mechanical properties and micro-structure.



Service: Experienced technical representatives are at your service to advise and assist on the choice of rolls for specific applications or on general rolling problems. They are there at all times to help and consultation with them before ordering is advised. The choice of roll will be made after careful consideration of all the mill factors and the history of the roll performances obtained by using different qualities in the customer's mill as well as in other similar mills.

Metal Rolls – Production Facilities: We have following facilities associated with **M/s Bansal Alloys & Metals Pvt. Ltd., Mandi Gobindgarh, M/s Unipearl Alloys., Mandi Gobindgarh and M/s K.L. Multimetal Rolls & Castings Pvt. Ltd., Malerkotla** With latest modern controlled technology to produce ultra high quality Cast Metal Rolls.

❖ **MELTING SHOP:** Melting shop comprise of the following units:-

- I. 08 Tons Twin Shell Medium Frequency Induction Furnace – 02 Nos.
- II. 12 Tons Twin Shell Medium Frequency Induction Furnace – 01 No.
- III. 02 Tons Twin Shell Medium Frequency Induction Furnace – 01 No.
- IV. 01 Ton Twin Shell Medium Frequency Induction Furnace – 01 No.
- V. 25 Tons Ladle Refining Furnace (L.R.F.) – 01 No.
- VI. 25 Tons Vacuum Degassing (V.D.) – 01 No.

1. **MOULDING SHOP:-** Moulding Shop have all the necessities facilities like Tools, Tackles and Patterns as well as comprises with following to cast Metal Rolls from Staring **Barrel Dia 300mm to 1000mm** and **Roll's Length upto 5 Mtrs. :-**

2. **Sand Muller/Mixer:-** 03 Numbers are having capacity 500 Kgs. Single batch for preparation of Green Sand and CO2 Sand.
3. **Moulding Boxes:-** Approx 100 Numbers Steel Fabricated Moulding Boxes in different sizes.
4. **Cast Iron Chillers (Chill Dies):-** We have minimum 02 sets Cast Iron chiller / chill dies to cast Metal Rolls starting from **Barrel Dia 300mm to 1000mm** and **Roll's Length upto 5 Mtrs.**
5. **Foundry Equipments:-** Each 02 Set of Hydraulic Equipments like Compressor, Pneumatic Rammers, Grinders & Chipper.
6. **Mould Carrying Ovens:-** 02 Numbers sizes Size W- 4 Mtrs. L-6 Mtrs. & H-4 Mtrs.
7. **Liquid Metal holding Ladles:-**

- I. 15 Tons L/M Holding Capacity with Stopper Gate – 02 Nos.
- II. 25 Tons L/M Holding Capacity with Sliding Gate – 01 No.
- III. 05 Tons L/M Holding Capacity with Stopper Gate – 02 Nos.
- IV. 03 Tons L/M Holding Capacity with Stopper Gate – 01 No.

❖ **ASSEMBLING AND CASTING:-** 03 Nos. RCC Casting Pits.

❖ **HEAT TREATMENT FURNACE:-** Heat Treatment & Stress Relieving are carried out wherever required in different capacities with Temperature Profile during Heat Treatment cycles are closely monitored and controlled as per Requirement:

- I. 50 Tons Single Batch Heat Treatment Furnace (Size W- 4 Mtrs. L-6 Mtrs. & H-4 Mtrs.) – 02 Nos.
- II. 30 Tons Single Batch Heat Treatment Furnace (Size W- 3 Mtrs. L-5 Mtrs. & H-3 Mtrs.) – 01 No.

❖ **MACHINE SHOP:-** Machine Shop is Fully Equipped with heavy Duty Machines of followings to capable machining from starting **Barrel Dia 300mm to 1000mm** and **Roll's Length upto 5 Mtrs. :-**

- I. Heavy Duty Rough Turning Lathes in different sizes starting from 14' to 24' – 40 Nos.
- II. Heavy Duty Finishing Lathes in different sizes starting from 12' to 24' – 10 Nos.
- III. Roll Grinding Machine with Taper & Cambering attachments – 03 Nos.
- IV. Horizontal and floor Boring Machines – 01 No.
- V. Wobbler Lathe Machines – 06 Nos.
- VI. Plano Millers – 01 No.
- VII. 2 Meter VTL. – 02 Nos.

❖ **QUALITY CONTROL EQUIPMENTS:-** Quality Control unit comprise following testing equipments:-

- I. 32 Channels Spectrometer and Chemical Weight analysis Lab. – 02 Nos.
- II. Ultrasonic Testing Machine – 02 Nos.
- III. Hardness Testing Machine (Equip Tips Hardness Tester, Poldi Impact Hardness Tester & Shear Pin Hardness Tester) – 02Nos.
- IV. Mechanical Testing Lab (UTS, YS Impact & Bending Strength) – 01 No.
- V. Microscope Machine – 01No.

QUALITY ASSURANCE PLAN (Q. A. P.) of Metal Rolls - Production

Metal Roll is tailor made products to crafting various types of steels in different shape and size (Angle, Channel Beams, Girder, Flat, Strips, Round, Square, TMT & Wire Road etc.) it has to perform under many critical conditions during Hot Rolling. So required below characteristics:-

- **High wear resistance due to friction.**
- **A firm structure against breaking high mechanical resistance even at temperature change.**
- **Resistance against sudden heavy Impact and Bending load due to reduction.**
- **Resistance against thermal and fire cracks on surface which gets in contact with constant hot materials.**
- **Machining ability so that can be machining according to pass design and assembling with bearing.**
- **Resistance against Tensile load due to Hi RPM.**

To fulfill above entire characteristics, need very careful operation at every step of production process. Therefore we have **Quality Assurance Plan (Q.A.P.)** to achieve better Quality Parameter which provides more Pass life with better finishing in Rolling Products controlling with Breakdown in Rolling Mills:

1. MELTING

(i) Melting of Spheroidal (Nodular) Graphite Iron (S.G.I.) Rolls -

Melting is carried out through induction furnace by charge mix of selective Alloyed Based Melting fresh scrap after chemical analysis by Spectro lab of each lot along with 30% to 40% returns scrap (Turning, Riser & Runner) for the same grade. Ferro Alloys are to be added during melting depending upon requirement of grades. We are used to apply Soda Ash-Treatment applying with organ gas in 1st Ladle to De – Sulphurizing on High Temperature (1450°C to 1500°C) to become lower side of Sulphur (Max. 0.020%) as well as proper homogeneity of various Alloys in liquid metals and also controlling the casting – temperature (1300°C to 1400°C). After De – Sulphurizing we used to do Nodularizing by NiMg (Nickel Magnesium) to get Spheroidal (Nodular) Structure. During melting we are getting multiple bath samples for chemical composition to determine formation of microstructure (Pearlitic Matrix with Nodular Graphite, Carbides and some Pearlite as well as Bainitic – Martensitic Matrix with Nodular Graphite and Carbides). As well as to achieve required chemical composition - range which is aimed by view point of application in rolling mills.

(ii) Melting of Alloy Cast Steel / Adamite and Graphitized Steel / Graphitic Rolls –

Melting is carried out through induction furnace by charge mix of selective Alloyed Based Melting fresh Scrap after chemical analysis by Spectro lab of each lot along with 40% to 50% returns scrap (Turning, Riser & Runner) for the same grade. Ferro Alloys are to be added during melting depending upon requirement of grades. During melting we are getting multiple bath samples for chemical composition to achieve required chemical composition - range which is aimed by view point of application in rolling mills. After melting, molten metal is being taken in Ladle Refining Furnace (L.R.F.) following the spherodization, Seeding, De-Oxidation and Grain Thinning.

2. Moulding & Casting

Moulds of Metal Rolls are prepared by applying of **Directional Solidification Static Vertical Casting with Tangential Gate through Bottom Pouring System**. In preparation of mould we used to apply green sand process with proper contraction and machining allowances then go to baking in oven before assembling. Casting of entire Rolls are carried out in Closed Pit to avoid stress due to direct air cooling. Moulds are assembled in five parts as per below: - **(i) Bottom Journal (Drive Side)** - Moulding with Green sand and Cast Iron Side Segment Chills with Bottom Chill Plate **(ii) Barrel –** Barrel of Rolls Casted in Cast Iron Chiller (Chill Die) due to Higher Conductivity of Heat, **(iii) Top Journal (Non Drive Side)** – Moulding only with Green sand Process, **(iv) Riser (Feeder) –** Through Exothermic Sleeves to provide long time temperature in liquid metal for feeding against shrinkage by chiller zone. **(v) Runner & Getting System –** Moulding with Refractory Sleeves, Washer and Tangential Getting. In our Pouring technique L/M poured throughout in mould through bottom **Tangentially Gate** with high pressure so that L/M filling inside the mould in vertical upward direction in circular motion (clock-wise). Therefore casting becomes free from all type of inclusion and air-blow. We apply re-pouring after few times again direct in riser with hot metal to extra feeding as well as used to apply exothermic powder time to time in riser to make liquids. Entire moulds of roll covered with vermiculate in close pit till certain period according to volume and shape of Roll-Castings to controlled cooling.

3. Heat – Treatment (FOR ALLOY CAST STEEL & GRAPHITIZED STEEL ROLLS)

We used to apply Double Annealing followed by Tempering Cycle in Heat Treatment furnaces with modern pulse firing system and high speed burners with automatic zone & individual burner control systems ensure high precision heat treatment. Entire Alloy Cast Steel & Graphitized Steel (Graphitic) Rolls undergo a sophisticated multistage with high temperature H. T. cycle with proper soaking period to achieve combination of Hardness, Toughness and Wear Resistance require of particular application.

4. Machining

Machining of Metal Rolls carried out after Primary Inspection like Dimensional, Chemical Composition and Micro Structure. Machining has been done in two Phase – in 1st Phase Rough Cast Rolls machined in Proof Machine Condition then secondary inspections used to do like Dimensional and Physical Testing (Hardness, Tensile, Bending & Impact) and in 2nd Phase Proof Machined Rolls again machined in Finish Machine Condition as per approved drawing from party. Machining process is carried out with controlled RPM and tolerance. During machining, have to take very careful supervision about measurement and surface conditions time to time.

5. Quality Inspection

Our Quality Control Engineers and Experts go through final Inspection by latest calibrated Measuring, DT & NDT equipments of Finished Rolls for Dimensional, Chemical Composition as well as DT & NDT according to requirement from party or need to application of Metal Rolls in rolling mills.

SOME PHYSICAL METALLURGY TERMS

The below information not scientifically exact; it is only intended as a general guide to metallurgical terminology used in this catalogue.

Accicular: - The appearance of some “needle-like” structures consisting of bainite and martensite.

Austenite: - Structural component formed during the solidification of the roll. Most of the austenite is transformed to other components during the cooling of the roll or during the subsequent heat treatment. The austenite remaining in the finished roll is called retained austenite and is undesirable in larger amounts.

Bainitic: - Structural component obtained in some rolls. Increase the hardness (as compared to pearlite)

Carbides: - Chemical compounds of carbon and one or more metals, e.g., iron carbides, chromium carbides. Primary carbides are formed during the solidification, secondary carbides during the subsequent cooling or during heat treatment.

Chill Test: - Test method used in the foundry. A few kilograms of the melt are poured into a sand mould with the bottom made of cast iron. The melt solidifies from this end of the mold. The solidified piece of iron is then broken in such a way that changes in the fracture appearance along the solidification path can be observed. These changes give information on the – structure of the rolls to be cast from the same melt.

Ferrite: - Structural component which in most cases consists of almost pure iron.

Graphite: - Pure carbon, can appear as flake graphite or nodular graphite.

Heat Treatment: - the controlled heating and cooling of materials in furnaces at particular temperatures in order to alter their properties.

Matrix: - The main part of the metal structure when regarded in up to 1000x magnification. The matrix surrounds the other phases present, like graphite and carbides.

Martensite: - Structural component obtained in heat treated rolls alloyed with nickel etc. increases the hardness considerably (more than bainite). When martensite is annealed tempered martensite is formed.

Nodular (Spheroidized) Iron: - A cast iron that has been treated in the liquid state so as to cause a substantial portion of its graphite carbon to occur as spheroids or nodules rather than flakes.

Normalizing: - A high temperature formed in most roll process in which steel or other materials are austenitized and then air cooled.

Pearlite: - Structural component formed in the most roll materials, consisting of a fine mixture of ferrite and iron carbide lamellae. Bainite and martensite have better strength and wear resistance.

Stress Relieving: - Heating to a suitable temperature, holding long enough to reduce residual stresses and then cooling slowly enough to minimize the development of new residual stresses.

Tempering: - Reheating a normalized ferrous alloy to suitable temperature at the necessary transformation range, holding long enough to allow transformation to take place and then cooling slowly enough to minimize the development of residual stresses. This removes brittleness. Increases ductility and reduces hardness.

Infrastructure

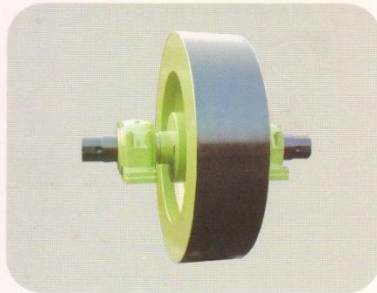


- Errectioning/Commissioning of Rolling Mills
- Productivity Maximization
- Modernization of Existing Plants
- Cost Minimization

A.M.Metalics is the outcome of strong determination and discipline to achieve a level of quality for its products to gain confidence of its clients by way of its engineering technology, workmanship & stringent quality controls. A.M.Metalics's products are engineered to precision, accuracy and perfection. Their performance is testimony of their durability....



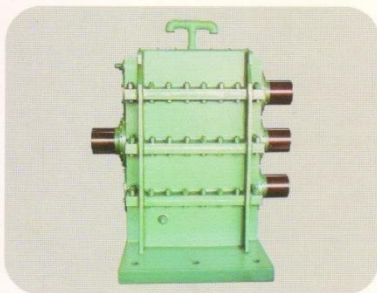
Products



FLY WHEEL



REDUCTION GEAR BOX



PINION STAND



MILL STAND



SECTION STRAIGHTENING MACHINE



SHEARING MACHINE



ROLLS



GEAR COUPLINGS

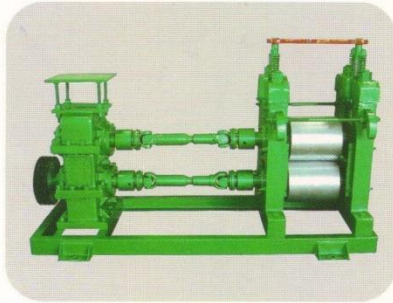
Products



ROTARY SHEAR SWIVEL



ROTARY SHEAR FIX



PINCH ROLL



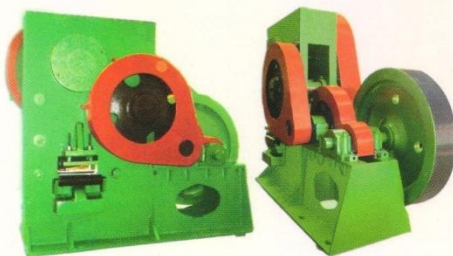
MECHANICAL PUSHER
FOR RE-HEATING FURNACE



HORIZONTAL SHEARING MACHINE



VERTICAL SHEARING MACHINE

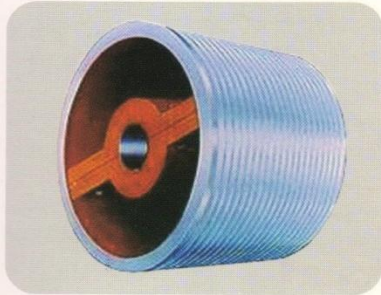


BILLET SHEARING MACHINE
FOR SS & MS

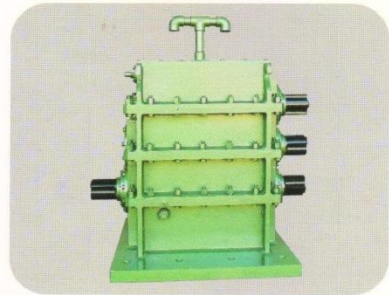


FITTED REDUCTION & PINION GEAR BOX

Products



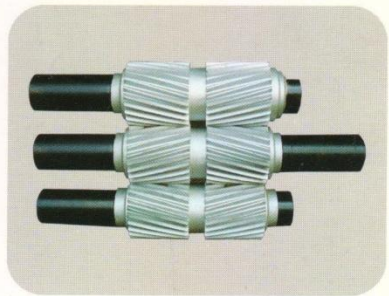
V-BELT PULLEY



SPEED INCREASER



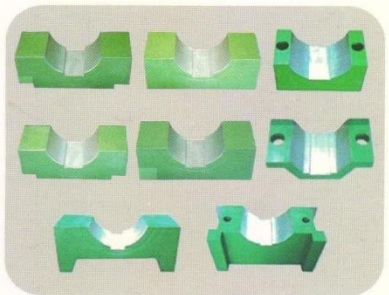
FOUNDATION RAIL



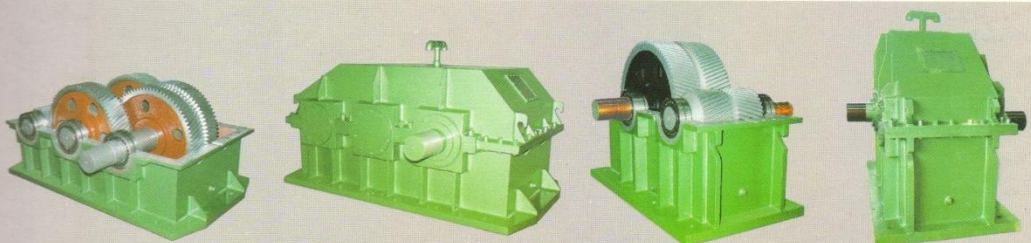
PINION GEARS



GEAR



STEEL CHOCKS FOR FIBRE BEARING



REDUCTION GEAR BOX (OPEN & CLOSE VIEWS)

.....and any other part/machinery of steel rolling mills.