



GREEN STEEL

CLEAN STEEL



SLR Metaliks Limited - SLRM

SLRM is leading carbon, alloys and special steel producer, located near iron ore mines in Hospet-Bellary region in Southern Indian state of Karnataka. SLRM is well connected, with 4 major deep-sea ports in 300-500 km. range.

It is a 3,00,000 tpa capacity plant located on 292 acres of land and commenced commercial production in 2017. SLRM produces over 177 types of steel grades for various critical applications in automotive, infrastructure, defense, oil & gas and engineering industries.

Philosophy of Business :

Distinctive characteristics of SLRM philosophy & growth strategies are

- Assimilate world class manufacturing technology.
- Strict adherence to quality standards. Rigorous application of metallurgical analysis and process control to ensure zero product nonconformity with highest safety norms.
- High flexibility and reliability in offering tailor made, innovative solutions for customers.
- Focus on building long term relations with customers, so that they become partners in business.
- Focus on continuous improvement & technical advancement with support of in-house R&D department.

Our Vision :

The Company strives to emerge as the leading producer of Special Alloy Steel in Asia Pacific by 2025 through investing in avant-garde innovations and capacity creation.

Our Mission :

Consumer satisfaction figures supreme in SLRM's list of importance. Quality assurance; stripped costs and negotiating time line crunches without creating an environment payload are SLRM's gospels. The Company has consistently addressed complex and dynamic demands of consumers through robust engineering.

Corporate Values :

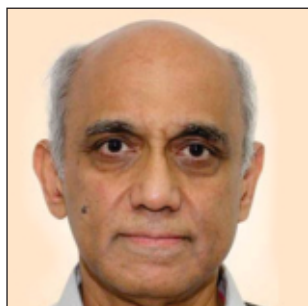
SLRM vouchsafes transparency, innovation and excellence that trigger a sense of belongingness in its consumers and employees.

Quality Policy :

- SLRM is committed to provide Accurate, Reliable, Impartial, Transparent & Timely Test results to the customers by following good professional & safety practices.
- Laboratory is also committed to comply with ISO/IEC/17025:2017 and continually improve effectiveness of Laboratory Management System.

The Strength of SLR Metaliks Limited :

SLRM has entered into a joint-venture with Fomento Resources Private Limited. The association has been a shot in the arm for SLRM. It has triggered a stampede of opportunities and prospects. The alliance has made SLRM immune to the crisis of raw materials. Captive mines ensure that steel production remains uninterrupted.



Mr. Auduth Timblo, serves as the Chairman at Fomento Resorts & Hotels Limited and has been its Non Executive Director since February 1993. Mr. Timblo serves as a Director at Sociedade de Fomento Ind. Pvt. Ltd., Fomento Barges Pvt. Ltd., Fomento Eng.& Const. Pvt. Ltd., Formar Pvt. Ltd., Shelvona Riverside Rail Terminal Ltd. and Mormugao Maritima Ltd. Mr. Timblo holds a B.E and L.L.B.(General). Fomento Group worth is approx. Rs. 5,500/- crores.

Mr. Auduth Timblo

Patron & Mentor

Mr. Raj Kumar Goel, the Managing Director of the Company, has rich experience in Steel Marketing and he has been Managing Director of the Company since its incorporation in 2007. He leads his dynamic team with perfect determination and commitment resulting in commissioning of various plants such as Sinter, MBF, SMS, RMS, downstream activities and also 6 MW captive Power Plant. SLRM started from ground level and due to his out of the box inspirational leadership and management qualities and the Plant reached a golden capacity of 0.3 million tonnes of alloy steel. His strong vision is to achieve 1.0 million tonnes per annum by the year 2025.



Mr. Rajkumar Goel
Managing Director

No wonder SLRM has impressive list of global OEM clientele which has helped to register 27% CAGR growth in revenue in past 5 years. In 2021, Care Rating India rated SLRM BBB+ on quality of earnings and ability to sustain financial performance.

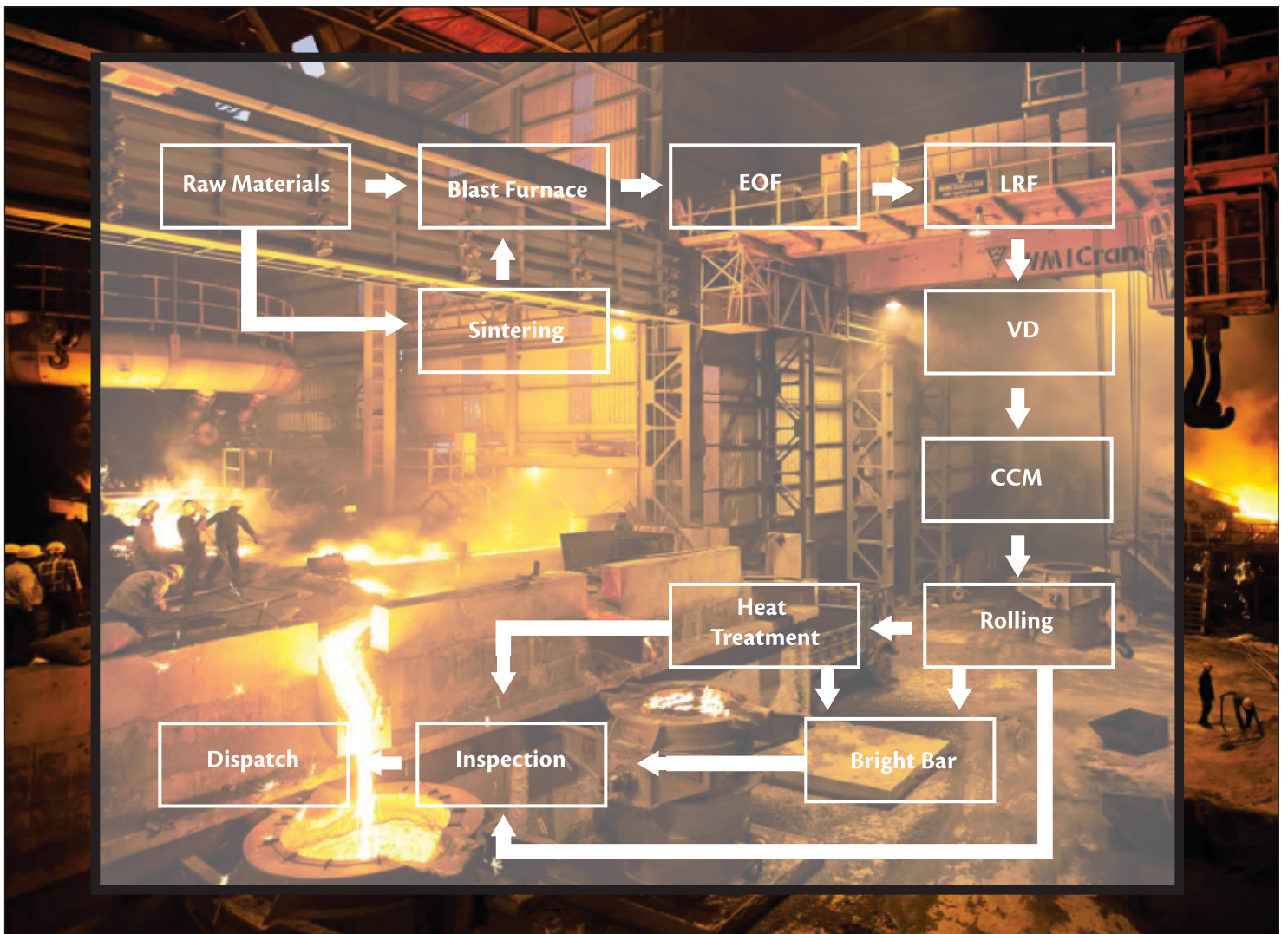
SLRM has taken the step with the intention to replace coking coal with hydrogen as it reduces emission from steel making by at least 90%

SLRM has put in place scrap preheating system which is installed in the energy optimised furnace to enhance overall furnace efficiency and also carried out the refurbishment of the caster.

SLRM is known to satisfactorily cater to the demands of its customer base. The business came into existence in 2012 and has since been the known name in its field.

SLRM produces steel from virgin method through blast furnace and energy optimization furnace route.

Process flow diagram of steel manufacturing at SLRM



MBF

Mini Blast Furnace of 262 M3 working volume produces 300,000 tpa of hot metal. Use of sinter upto 70%, pulverised coal injection and oxygen enrichment system helps in achieving this. Sinter from sinter plant, calibrated lump ore, limestone, dolomite, quartzite, coke are charged into the MBF from top and hot air is passed from the bottom. Ascending oxygen in the air reacts with the carbon in the coke to form CO which reduces the descending iron oxide to iron. Hot metal at required temperature is collected in the hearth at the bottom of the furnace and is tapped periodically and transferred to steel melting shop (EOF).

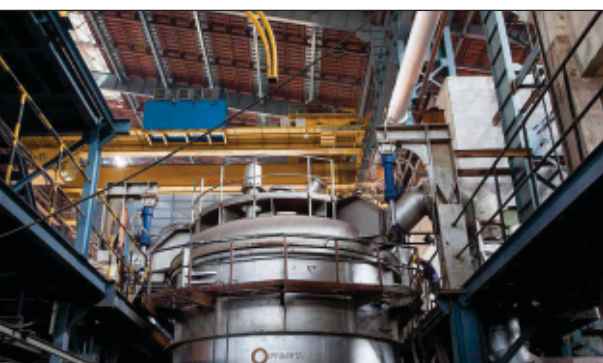


EOF

Energy Optimization Furnace is oxygen steel making process best suited for alloy steel production from hot metal. It ensures slag free tapping, virgin steel with low tramp elements and excellent metallurgical properties, especially with regard to dephosphorisation.

LRF

Ladle Refining Furnace with APB induction, German technology, having alloy feeding system, carries out refining of steel. The required chemistry of steel is achieved by addition of ferro alloys and cored wire injection. It also helps to maintain stringent chemistry and required temperature for casting.



VD

Vacuum Degassing, involves exposing the liquid steel to a high absolute vacuum to reduce dissolved gases like nitrogen, hydrogen & oxygen. This also reduces oxide inclusion in liquid steel & provides the technical conditions that are favourable for good desulphurisation. Mechanical vacuum pump type vacuum degassing system facilitates reaching <1Mbar within 5 minutes.



Continuous Casting

Three strand, Continuous Casting machine with double radius 9/16 metres, from SMS concast produces blooms, which are used for internal rolling. As cast Round Billets are also supplied for manufacture of seamless tubes. It is a close casting process with slag detection system, AMLC and EMS.

Auto Billet Grinder

Auto Billet Grinding facility ensures surface defect removal in as cast stage. This helps in eliminating surface defects in rolled products and improves surface quality making steel bar amenable for warm forging, cold forging & complicated forging process.



Rolling Mill

- ▶ Rolling Mill has state of art technology. It is supplied by Primetal Technologies Ltd. (Formerly Siemens).
- ▶ Mill is configured with 20 stands of horizontal vertical combination.
- ▶ Additional 3 sizing blocks can offer rolled bars with DIN/4 tolerance. The precision rolled bars are used in cold forging & other critical applications.
- ▶ Online orbis dimensional gauge for accurate measurement of dimensional tolerances.

Automated Online Inspection System

Automated Online Inspection System consisting of phased array auto UT and magnetic flux leakage (MFLT) for the rolled bars. It is an important equipment which enables inspection of bars for internal or external soundness with strict quality norms.



Bright Bar

SLRM offers Bright Bars of all grades in the size range of 18-75 mm for warm forging, cold forging & other critical applications

Process Condition	Size	Out of Roundness	Ra value micrometers	Straightness (MM/MTR)
Peeled & Reeled	h11	70% of h11	upto 1	0.8
Peeled & Ground	h9	50% of h9	upto 1	0.8
Peeled , Ground & Polished	h9	50% of h9	upto 0.8	0.8



Heat Treatment

Annealing Furnace

SLRM has batch type electric Annealing Furnace with heating bell & bogie arrangement of capacity of 35 MT/Batch with PLC controlled automatic system & computer controlled (SCADA) production process.



Induction Quenched & Tempered Line

SLRM has continuous type induction hardening & tempering furnace for round bar (20-100mm) of capacity 900 MT/Month with PLC controlled automatic production process & on-line temperature-time trend recording.



Shot Blasting Facility

It utilizes a centrifugal blast wheel that shoots steel shots onto the surface of the bars to knock the surface free of debris & scales. It cleans the surface of the bars.





Green Steel

India has announced its commitment to reach net zero greenhouse gas emission by 2070. This lays down a long term road map for companies in India's industrial sector especially steel industries. SLRM has already started strong & focused action in this direction to reduce carbon footprint (CO₂ reduction). We are able to control CO₂ emission to 2.1 against 2.5 TCO₂ eq/TCS in other steel plants of similar capacity.

Energy saving (Electricity and Gas) -

Company is constantly working on energy saving and has obtained remarkable improvement as below -

- At SLRM blast furnace flue gas is used as a basic fuel for sinter, stoves of blast furnace, captive power plant & reheating furnace at rolling mill instead of fossil fuels like oil & coal.
- Captive Power Plant: The captive power plant installed in house, utilizes blast furnace gas as basic fuel which is clean fuel technology. In a smart step for environmental protection, the technology applied is tailor-made to recover enthalpy of blast furnace gas specifically designed to facilitate power generation of 3 MW.
- Specific energy consumption of each division in the plant is monitored. By adequate measures & controls, SLRM has achieved the energy saving in power consumption, as mentioned in table. (Refer chart-1).

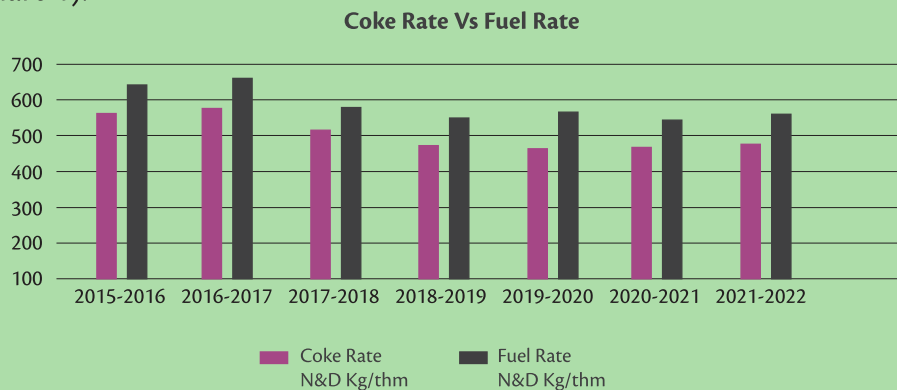


Chart-1

Actions on using Green Energy -

We at SLRM are committed to and working towards safe and green steel with constant focus. Successful efforts are made to increase green energy consumption in steel manufacturing by adopting sophisticated processes & practices of power generation through wind power, solar power & hydro power

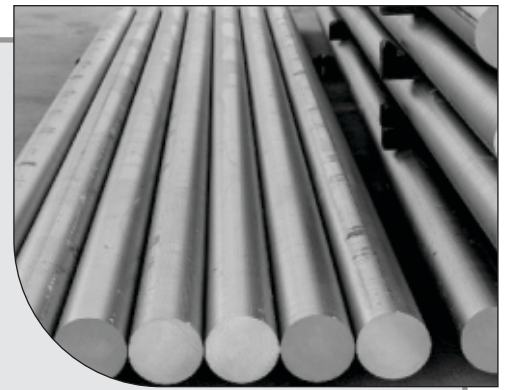
%Green Power used for steel production -

FY 20-21	FY 21-22	FY 22-23	FY 23-24
57%	66%	84%	94%

Continuous reduction in CO₂ footprint -

We are continuously increasing the green belt area in the manufacturing facilities. We have planted over **36,000** trees and will plant additional **35,000** saplings during 2022-23.

Clean Steel



The clean steel is characterized by low content of elements, such as phosphorus, sulfur, oxygen, nitrogen, hydrogen, tramp elements and inclusions.

Special features of SLRM Clean Steel -

- ▶ Able to control unwanted tramp elements to a very lower level as virgin steel is produced from carefully selected raw materials like iron ore and met coke. No purchased scrap is used for steel making. (Refer Chart 2)
- ▶ Able to control phosphorous in steel as the steel making is through specially designed EOF (Energy Optimization Furnace).
- ▶ Able to produce steel containing very low level of inclusions and gas content through VD which has very special accessories of mechanical pump. (Refer Chart 3,4,5)

Chart - 2

Tramp Element

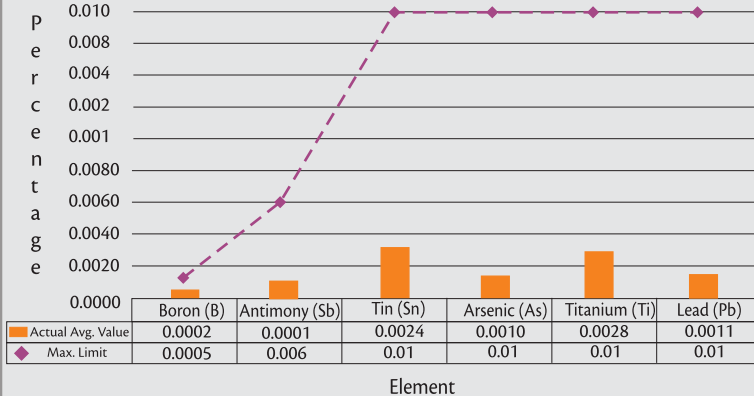


Chart - 3

Nitrogen Content in Steel

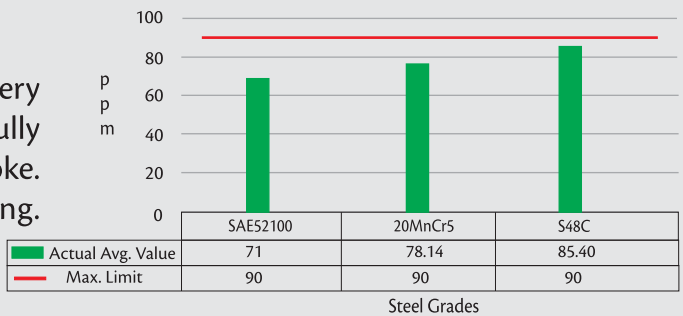


Chart - 4

Oxygen Content in Steel

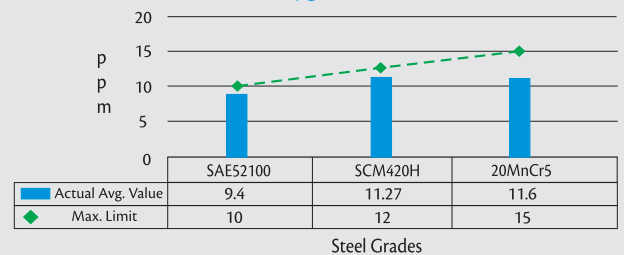
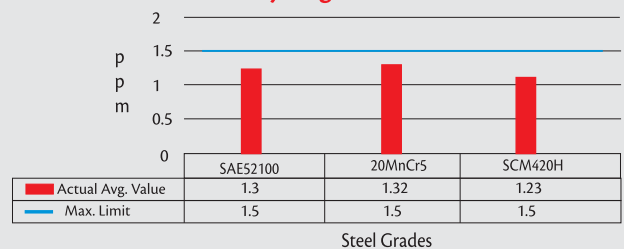


Chart - 5

Hydrogen Content in Steel



- ▶ Closed controlled casting of blooms is done through effective argon shrouding, slag detector, EMS (Electro Magnetic Stirrer), AMLC (Auto Mould Level Control) resulting into cleaner steel with improved overall steel quality & fatigue properties.
- ▶ At SLRM we evaluate the steel cleanliness by immersion UT, EVA along with K series & ASTM series.
- ▶ Rolling with high reduction ratio improves the internal soundness of rolled products.

Components made from SLRM steel has better heat treatment response, machinability etc . No wonder, SLRM steel is preferred source for many customers for their critical components for engine, transmission, steering, drive shaft, suspension & defense applications.

Product Range



Wire Rod (Round)
Dia. - 15mm to 32mm



Wire Rod (Hex)
A/F - 17.4mm to 23.5mm



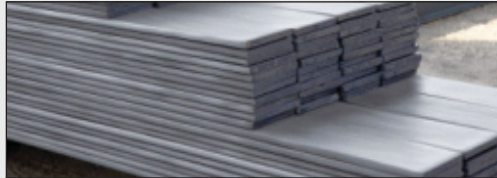
Round Bar
Dia. - 18mm to 95mm



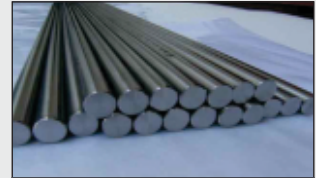
Hexagon Bar
A/F - 18.5mm to 53.5mm



RCS
55mm to 90mm, 122mm



Flats Width - 70mm to 101.6mm
Thickness 11 to 32 mm



Peeled bars - 16 - 75 mm
Peeled + CG Bars h9/h11

- Plain Carbon Steel
- Case Hardening Steel
- Cold Heading Steel
- Boron Steel
- Ultra Low Carbon Steel ($C < 0.05$)
- Free Cutting Steel
- Spring Steel
- File Steel
- Low Alloy Steel
- Medium C Alloy Steel
- Leded Steel
- Bearing Steel
- Micro Alloyed Steel
- Nitride Steel

Forging Steel

Steel bars and billets are subjected to the process of forging and forged - heat treated - machined components are used in automotive, defense & engineering applications.

The process of forging consists of converting the steel material into designed shape at a specific strain rate.

Forging quality steels are required to have several properties such as:

- Close control on chemistry & jominy hardenability
- Low tramp elements like Sn, As, Sb, Pb etc.
- Free from radioactive elements
- Un-interrupted grain flow
- Clean steel free from internal defects (Phased array auto UT route)
- Fine and uniform grain size
- Close dimension tolerance (PRBB routed bars)
- Free from surface defects (MFLT followed by MPI)
- Improved impact properties
- Good response to heat treatment



Forging Steels at SLRM :

Sr. No.	Steel Family	Grades
1	Plain Carbon Steels	SAE 1006, 1018, 1045, S30C, S48C, S53C, CF53 etc.
2	Carbon - Manganese Steels	ST 52.3, SAE 1541, 28Mn6, EN 15A, 37C15 etc.
3	Low Carbon Alloy Steels	16MnCr5, 20MnCr5, 20MnCr5B, SAE 8620H, SCM 420H, En355, En353, 25CrMo4, 20MC5, SCM415H, SCr420H etc.
4	Carbon Chrome Steels	34Cr4, 41Cr4, EN18, EN18D etc.
5	Carbon - Chrome - Moly Steels	SCM 435H, 42CrMo4, En19, SAE 4130, SAE 4140, 42CrMo2 etc.
6	Carbon-Chrome-Nickel-Moly Steels	SAE 4320, SAE 4340, SAE 8620, 18CrNiMo7 etc.



Cold Heading Steels

Cold heading quality steel undergoes cold forging process. Critical requirements of CHQ are as under:

Cold Heading Steels Grades	
SAE 1006	SAE 15B25
SAE 1008	19MnB4
SAE 1010	SAE 15B41
VS 13111	En19
SAE 1015	SAE 4140
SAE 1018	1E1286
SAE 10B21	

- Excellent surface quality achieved by using auto bloom grinding & MPI of blooms.
- Steel with improved cleanliness.
- Good control over size tolerances & ovality to ensure smooth forging process.
- Controlled surface decarburisation
- Good control over mechanical properties like tensile strength & reduction in area to ensure better cold forgeability.

Applications:

- Small Shafts
- Foundation & Tower Bolt
- Nuts, Bolts
- Fasteners



Micro Alloyed Steels

SLRM Micro alloyed steel contains small amounts of alloying elements (0.05 - 0.15%), viz. Nb, V, Ti, N₂. They are used to refine the grain microstructure and facilitate precipitation hardening. This steel does not require hardening & tempering since the desired strengths are achieved by controlled cooling of forged components. Auto & engineering industries are using this family of steels for various applications. At SLRM this family of steel is produced with narrow range chemistry with different combinations of DI and CE values.

Applications:

- ▶ Crank Shaft
- ▶ Connecting Rod
- ▶ Yoke
- ▶ Chain Link etc.

Micro Alloyed Steels Grades	
S36CVTiS2	17MnV6GSI
C70S6(M)	38MnSiVS6
S40CVS-HB	44MnSiVS6
30MnVS6	S45CS1V
38MnVS6	S25CHVS1
27MnSiVS6	MT-15
15V24	17MnV6
70MnVS6	



Free Cutting & Semi Free Cutting Steels

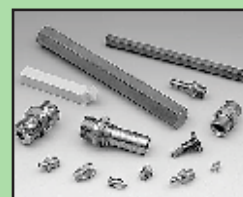
SLRM Free cutting steels / free machining steels form small breakable chips avoiding their entanglement in the machinery during machining, drilling, boring, etc. At SLRM machinability is enhanced by maintaining sulphur with or without lead with optimum of oxygen. SLRM process focuses on critical quality requirements for free cutting steels viz :

- ▶ Uniform distribution of manganese sulphide & its morphology
- ▶ Optimum level of %C & %Si to adequate aspect ratio

Applications:

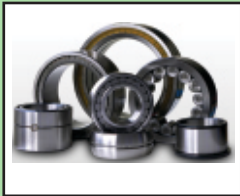
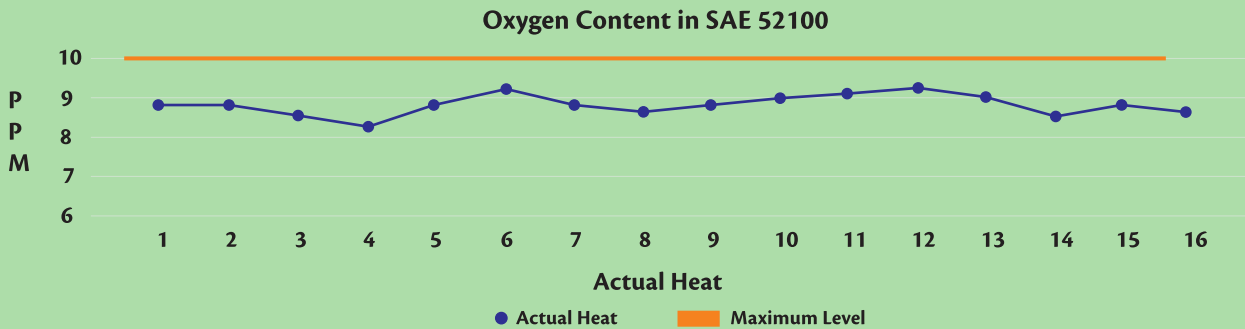
- ▶ Bolts & Nuts
 - ▶ Brake Assembly
 - ▶ Hose Nozzles
 - ▶ Instruments. etc.
- ▶ Yokes

Free Cutting & Semi Free Cutting Steels	
SAE1141	SAE1144
En8M / En8M(M)	En15AM
En1A	En1APb(M)
SAE 1141(V)	En1APb
11SMn30	12L14



Bearing Steels

Bearing steel undergoes continuous fatigue throughout its service. At SLRM fatigue life of steel is improved by maintaining lower oxygen content and control on titanium. During processing SLRM gives special attention to carbide banding and cleanliness of steel. As can be seen from graph oxygen content in bearing steel is controlled well below 10 ppm on consistent basis, improving its fatigue life.



Bearings Steels Grades
SAE 52100
100Cr6
100CrMo7
100CrMn6
20MnC5
SUJ 2
SAE 5219

Spring Steels

SLRM offers hot rolled flats for manufacturing of conventional and parabolic leaf springs for auto applications specifically LCV, MCV, & HCV. Round bars are used for helical coil, stabilizer and torsion bar.

Applications:

► Springs

► Leaf Springs

► Torsion Bar



Spring Steels
SUP9
SUP9(M)
SUP11A
55Si7
51CrV4
52CrMoV4
58CrV4
51B60H

Lab Equipments of SLRM - Steel Zone

Optical Emission Spectrometer - ARL 8860 (Fischer Scientific)
Carbon – Sulphur Analyzer (LECO-CS744)
Nitrogen and Oxygen Analyzer (LECO-ON736)
Hydrogen Analyzer (LECO-DH603)
Computerized Universal Testing Machine - 100 T (FIE)
Digital Impact Testing Machine - Charpy & Izod (FIE)
Computerized Brinell Hardness Tester (FIE)
Digital Rockwell Hardness Tester (FIE)
Image Analyzer (Olympus)
Stereo Microscope (Olympus)
Jominy Hardenability Apparatus (Metatech)
Forging Hammer 250 Kg (ABN Engineering)
Magnetic Crack Detector (Electro Magfield)



Hydrogen Analyzer



Universal Testing Machine

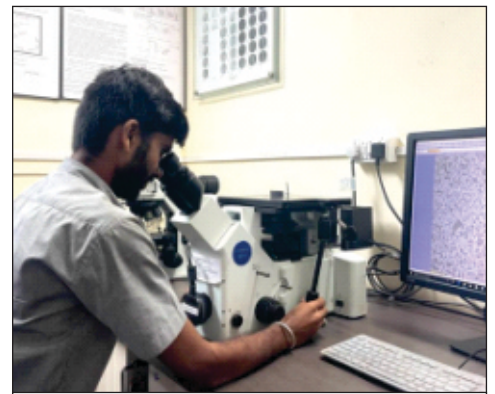


Image Analyzer



Optical Emmission Spectrometer



Digital Impact Testing Machine



Nitrogen and Oxygen Analyzer

Lab Equipments of SLRM - Iron Zone

XRF Spectrometer–PerformX- 300 (Fischer Scientific)
Optical Emission Spectrometer - M10 (Amtek)
CSR & CRI Equipments
Gas Chromatography
RI - RDI Instrument
CSN Apparatus



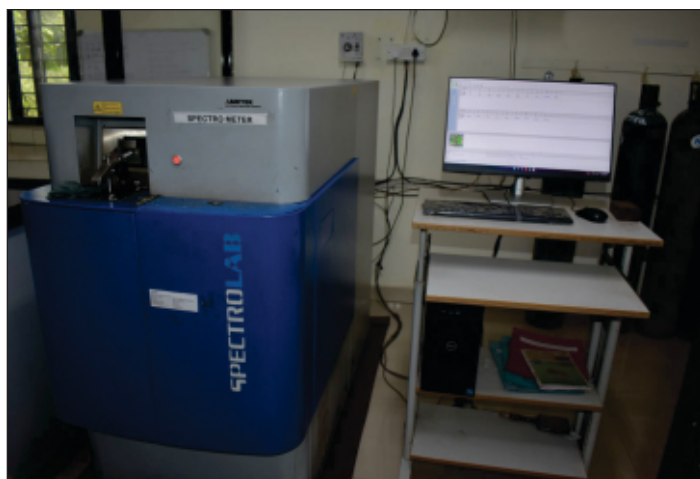
CSN Apparatus



RI - RDI Instrument



CSR & CRI Equipments



Optical Emission Spectrometer



XRF Spectrometer

Corporate Social Responsibility

Corporate Social Responsibility has gained prominence in the international business community and has become a mainstream activity. It's one of the mainstays of a business organization and in the current business configuration Corporate Social Responsibility is no longer defined by how much an organization contributes to charity. Currently the Corporate Social Responsibility of a Company is gauged by its overall involvement in activities that enhances qualitatively people's lives.

There is mounting recognition of the momentous effect the activities of the private sector have on the workforce, clientele, the society, the environment, competitors, business associates, investors, shareholders, governments and others groups. It is also becoming progressively clear that organizations can contribute to their individual wealth and to overall community wealth by taking into account the effect they have on the entire globe when making decisions.

Diverse factors have induced an ever growing interest in Corporate Social Responsibility. Fore mostly, being the expectations of citizens, consumers, public authorities, globalization and industrial dynamics. Secondly, an increasing influence of social take away on the investment decisions of individuals and institutions, as investors and consumers. The third factor is the growing concern about environmental degradation.

Our Organizations initiative in Corporate Social Responsibility are as follows :

- ▶ Installation of Computers and recruitment of teachers in the schools located in the vicinity.
- ▶ Free transport facility for students residing in the vicinity of the schools situated within the periphery.
- ▶ Free eye checkup camps & doctors visits to near by villages.
- ▶ Providing street lamps at villages.
- ▶ Construction of temple for social gathering of villagers.
- ▶ Constructed auditorium to school
- ▶ Construction of drinking water tank
- ▶ Providing of school bags and books to the village children.
- ▶ Drinking water tank to village





QMS ISO 9001:2015



IATF 16949:2016



EMS ISO 14001:2015



OHSMS ISO 45001:2018



IS 1875:1992



(IBR) - Well Known Steel Maker



NABL



RDSO