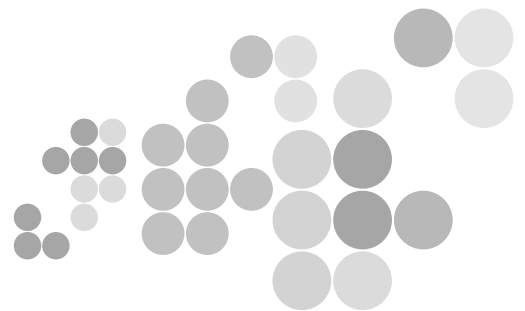


Steel

Carbon, Alloy and Bearing Steels for Various Industrial Applications



ISO 14001:2004



OHSAS 18001:2007



ISO/TS 16949 : 2002

ISMT LIMITED

Solutions You Can Trust

Steel

Carbon, Alloy and Bearing Steels for Various Industrial Applications

ISMT is an established market leader in special engineering steels. We produce carbon, alloy and martensitic stainless steel bars with special emphasis on ultra-clean steels, free machining steels, bearing steels, and other specially engineered steel grades. With over 15 years of experience in the manufacture of special steels, our strength lies in our ability: to produce very clean steels consistently and cost effectively; to produce hard to manufacture free machining steels; to develop and custom produce steels that meet specific mechanical and metallurgical requirements; and to deliver small lots of steels.

MODERN EQUIPMENT AND METHODS

We operate one of the most modern alloy steel plants in the country located at Jejuri, near Pune. All our steel is produced through the electric arc furnace (EAF) route, is ladle refined, vacuum degassed, continuous cast and rolled. The primary equipment is supplemented by best in class quality enhancing devices such as an automatic mould level controller, non-sinusoidal tundish oscillators, electro-magnetic stirrers etc., with the singular objective of producing the best steel.



CAREFULLY CHOSEN INPUTS

The quality of inputs for melting has a direct bearing on the quality of the output. For this reason, we melt a very carefully chosen mix of virgin metal (pig iron and DRI) and clean scrap so as to control the appearance of tramp elements. We have a trusted set of suppliers - all of whom are periodically audited to ensure adherence to our standards. In addition, we test all incoming material for radiation and other hazardous contaminants.





CLEAN STEEL PROCESS

ISMT prides itself on manufacturing the cleanest steel in the country, on par with the best worldwide – this is entirely attributable to our steel making practices.

While good equipment is a prerequisite for making clean steel, at ISMT we believe that good practices are even more vital. While modern equipment may be procured at a cost, good practices are much more difficult to develop and institutionalize – it takes determination, time and painstaking effort. For this reason, throughout our 15 years of steel making history, we have focused on developing process knowhow, training people, and creating a committed quality culture.

We are proud to say that our processes and practices are second to none. We follow a strict de-oxidation practice to ensure that macro inclusions of alumina and silica are floated out quickly from the molten metal. We ensure that the slag in the LRF is synthesized quickly and that the slag volume and chemistry are appropriate for complete slag killing. Similarly, low re-oxidation at the caster is ensured by controlling the superheat, achieving free opening consistently, and by adhering to proper tundish and mould practice.

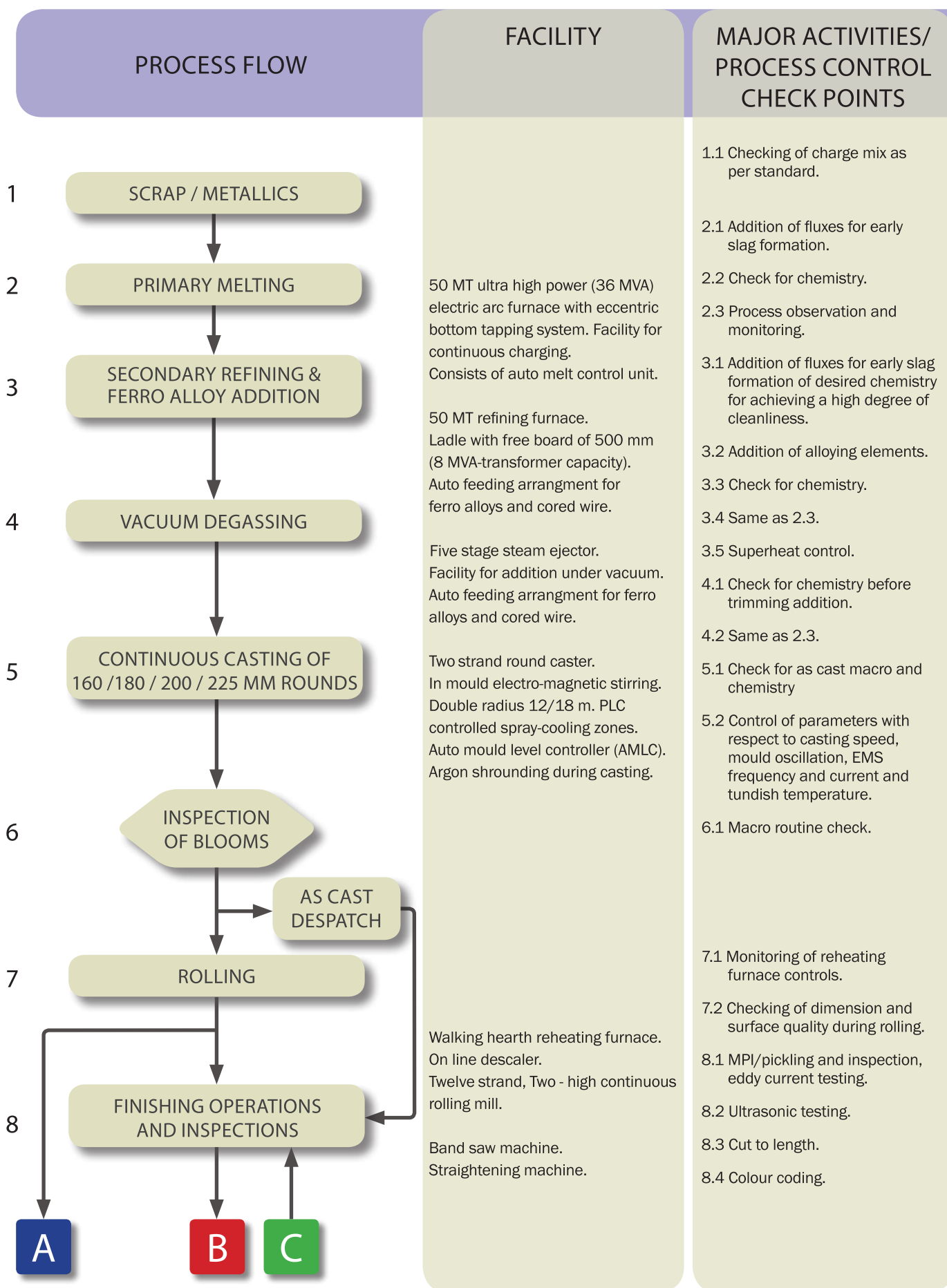


APPLICATION BASED STEEL MAKING

At ISMT, we like to understand where our steel is used. Wherever possible, our Technology Process Group (TPG) interacts with customers at the shop floor and at the R&D level to translate the customers' product requirement into a steel specification and a steel making process specification. This "application based" approach enables to deliver the most suitable and cost effective product. Today, given our history and our approach, we have developed an understanding of hundreds of applications that use our steels and we can use that experience to help you either select a steel or to develop a new grade appropriate to your requirements.



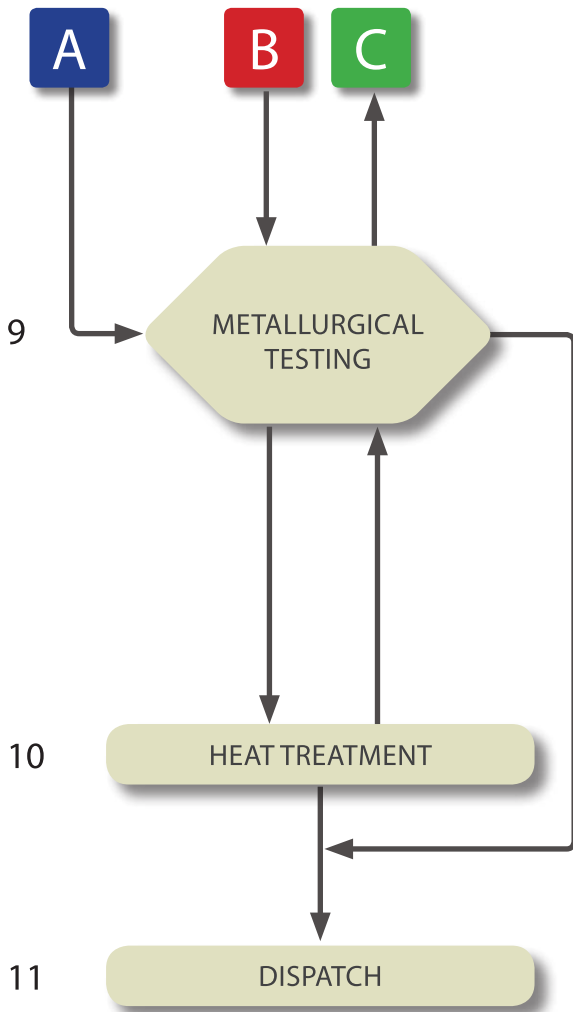
PROCESS FLOW CHART FOR MANUFACTURE OF CARBON & ALLOY STEELS



PROCESS FLOW

FACILITY

MAJOR ACTIVITIES/
PROCESS CONTROL
CHECK POINTS



Vacuum emission spectrometer.
Carbon sulphur determinator.
Hydrogen, oxygen, nitrogen
gas determinators.
Tensile testing machine.
Impact testing machine.
Hardness tester.
Magnetic crack detector.
Mobile spectrometer.
Metascope.
Metallurgical microscope.

Electrically operated bogie
hearth furnace for:
annealing, normalising,
spheroidised annealing.

- 8.5 Straightening of bars.
- 8.6 Spark / spectral testing of the lot for mix-up detection by the mobile spectrometer / metascope.
- 8.7 Bundling and tagging.
- 9.1 Metallurgical tests like chemistry, macro, micro inclusions, grain size, decarb, step down, gas analysis, blue fracture, mechanical properties and other required tests.
- 9.2 Testing and certification as per technical delivery conditions.
- 10.1 Monitoring of heat treatment cycle.
- 10.2 Checking of hardness, micro structure and mechanical properties.

PRODUCT INFORMATION

Installed Capacity 350,000 MT/annum

Process Route EAF - LRF - VD - CCM - RM

Heat size 45 MT

Products As Cast Rounds
Rolled Round Corned Square (RCS)
Bright Bars (Peeled / Turned) Cold Drawn / Cold Finished)

Size Range

As Cast Rounds : 160, 180, 200 and 225 mm dia.
Rolled Rounds : 25.4 to 115 mm dia for all applications and 125 to 170 mm dia for seamless tube industry
Round Corned Square (RCS) : 45 to 75 mm and 125 mm

Standard Hot Rolled Sizes

Rounds : 25.4, 26, 26.4, 27, 28.3, 30, 32, 34, 36, 38, 40, 42, 45, 48, 50, 52, 56, 60, 63, 65, 70, 75, 80, 85, 90, 95, 100, 105, 115, 125, 137, 150, 170 mm and as cast - 160, 180, 200 & 225 mm
RCS : 45, 50, 52, 55, 60, 63, 65, 70, 75 mm and 125 mm

Additional sizes / shapes upon specific request / agreement.

Supply Lengths

Standard 3 to 6 m with 10% shorts down to 1 m or user defined.

Straightness Tolerance

Hot Rolled : 3.0 mm per meter
Hot Rolled and Machine Straightened : 1.5 mm per meter
Cast Product : 5.0 mm per meter

Length Tolerance for Fixed Length Supply + 50, -0.00 mm

Conditions of Ends

Standard Gas Cut / Hot Sheared (as per customer requirements,)

Standard Size Tolerance for Hot Rolled Bars / Billets

Nominal Size (mm RCS)

Over	Upto and including	Tolerance on size	Ovality
25.4	28	+0.25	0.40
28	31	+0.28	0.45
31	34	+0.30	0.50
34	38	+0.36	0.60
38	50	+0.40	0.60
50	64	+0.8, -0	0.80
64	89	+1.2, -0	0.80
89	114	+1.6, -0	1.20
114	139	+2.0, -0	1.50

Nominal Size (mm RCS)

Over	Upto and including	Tolerance on size	Out of squareness
-	50	+0.6	0.60
50	64	+1.2, -0	0.80
64	89	+1.8, -0	1.30
89	100	+2.4, -0	1.80

Tolerance on weight Kg per meter shall be +4%, -0%

For cast rounds size tolerance shall be +3mm and ovality 2.5% of dia.

Alternative tolerances upon specific request / agreement.

PRODUCT INFORMATION

Grades (Illustrative)

Plain Carbon Steels	: SAE 1008, SAE 1010, SAE 1012, SAE 1019, SAE 1026, SAE 1035, SAE 1040, SAE 1045, SAE 1518, 070M20, 080M40, 080M46, 070M55, CK35, CK45, CK55, CK60 etc., and equivalent.
Case Hardening Steels	: 665M23, 635M15, 637M17, 815M17, 820M17, 822M17, SAE8617, SAE8620, 15Cr3, 16MnCr5, 20MnCr5, 15CrNi6, SCM415, SCM420, SCM421 etc., and equivalent.
Spring Steels	: 55Si7, 60Si7, 37MnSi5, 50CrV4, 38XC, 50Cr4V2, 51CrMoV4, 52Cr4Mo2V etc., and equivalent.
Free Cutting Steels	: SAE 1117, SAE 1137, SAE 1140, SAE 1141, 216M36, SAE 1144, EN-8M, EN-1A etc., and equivalent.
Ball Bearing Steels	: SAE 52100, 103Cr2, 100Cr6, SUJ 2 etc., and equivalent.
Micro Alloyed Steels	: HMnV, 38MnSiVS5, 49MnVS3, C7056 etc., and equivalent.
Other Alloy Steels	: SAE 4130, SAE 4135, SAE 4140, SAE 4340, 817M40, 34Cr4, 37Cr4, 41Cr4, 25CrMo4, 42CrMo4, 40NiCrMo4, 40NiCrMo15, SCM435, SCM440, SA182-F11, SA 182-F12, SA 181-F11, T-5, T-9, T-23, T-91 etc., and equivalent.
Ferritic Stainless Steels	: AISI-410, AISI-420
Tool Steels	: H-11 and H-13

Control Chemistry

Carbon	: 03 points
Manganese	: 05 points
Sulphur	: 10 points
Chromium	: 05 points
Molybdenum	: 05 points

Tramp Elements (max.)

Tin	: 0.02%
Copper	: 0.15%
Chromium	: 0.20%
Nickel	: 0.20%
Molybdenum	: 0.05%
Boron	: 4 ppm max

Grain Size Guarantee ASTM 5 to 8

Alternative grain size upon specific request / agreement.

Inclusion Rating Guarantee

Carbon & Alloy Steels	: Thin series ABCD - 2 max. Thick series ABCD - 1.5 max or as per customer requirements.
SAE 52100	: Thin and Thick series A - 1.0 max., B - 0.5 max., C - nil, D - 0.5 max.
Resulphurised steels	: Thin and Thick series A - 3.0 max., BCD - 2.0 max.

Alternative inclusion rating upon specific request / agreement.

Oxygen Level

Carbon & Alloy Steels	: 25 ppm max
Bearing Steels	: 15 ppm max

Alternative oxygen level upon specific request / agreement.

Hydrogen Level 2 ppm max.

Nitrogen Level 80 ppm max.

Titanium Level 30 ppm max. in Ball Bearing Steels

Calcium Level 10 ppm max.

NDT Facilities Ultrasonic testing, Spark, Spectral, Mobile spectrometer, MPI testing

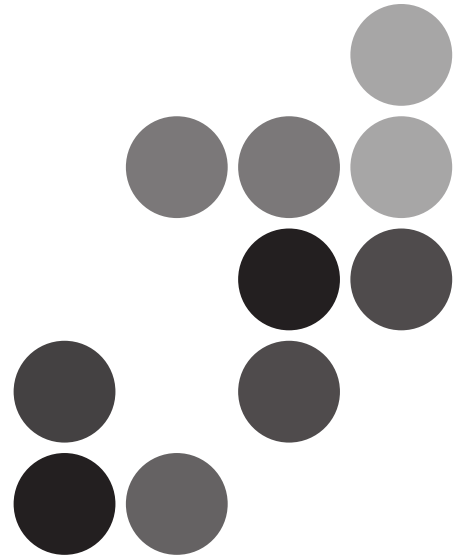
Finish Supply Condition

As Rolled	Bright Bars
Annealed	Drawn
Normalised	Peeled
Spheroidised Annealed	Ground
Quench & Tempered	

ISMT manufactures carbon/alloy steel and seamless tubes for:

- Energy and Power Generation
- Automotive Components
- Hydraulic and Pneumatic Pressure Lines
- Hydraulic Cylinders
- Gas Cylinders
- Mining and Construction
- Bearings
- General Engineering Applications
- Oil and Petroleum Applications

Product details are available on request



ISMT

Corporate Office

Lunkad Towers, Viman Nagar,
Pune - 411014, India.

Tel: +91 020 41434100/01
+91 020 66024901/02
Fax: +91 020 26630779

www.ismt.com

Subsidiaries

ISMT Europe AB

Box 1,
SE-688 21. Storfors, Sweden.

Tel: +46 (0) 550 655 00
Fax: +46 (0) 550 655 01
E-mail: info@ismteurope.com

www.ismteurope.com

ISMT North America

50 Main Street, Suite 1000-1015
White Plains, NY 10606, USA.

Tel: +1 914-500-2216
E-mail: info@ismtna.com

www.ismtna.com

Sales Offices

ISMT Europe (UK Sales Office)

2nd Floor, Blenheim House,
86 London Road, Leicester, LE2 0QR,
United Kingdom.

Tel: +44 (0)116 285 2888
Fax: +44 (0)116 285 2889

ISMT Europe (Germany Sales Office)

Katharinenweg 6, DE-73760,
Ostfildern-Kemnat,
Germany.

Tel: +49 (0)711 4560077
Fax: +49 (0) 711 4567142

Works

ISMT Tube Plant A

Ahmednagar, Maharashtra, India.
Tel: +91 0241 2777 845/946

ISMT Tube Plant B

Baramati, Maharashtra, India.
Tel: +91 0212 2438 61/62

ISMT Steel Plant

Jejuri, Maharashtra, India.
Tel: +91 02115 253335

Structo Hydraulics AB

Storfors, Sweden.
Tel: +46 550 388 00