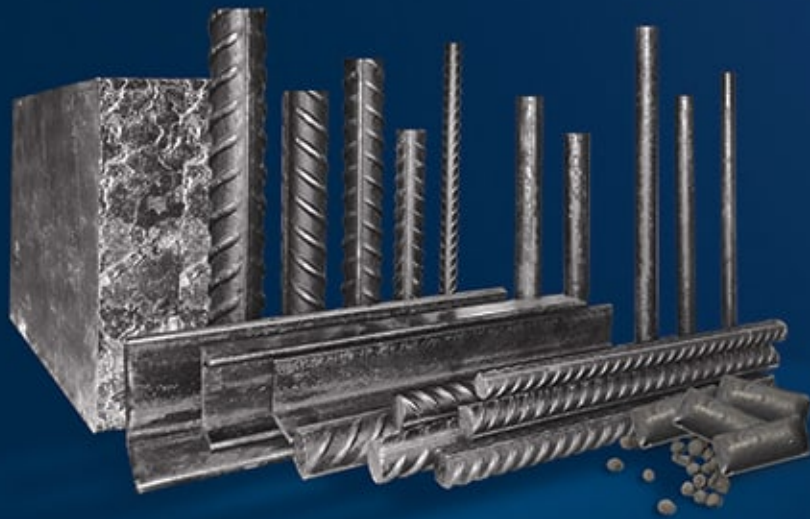




Khorasan
STEEL
Complex Co.



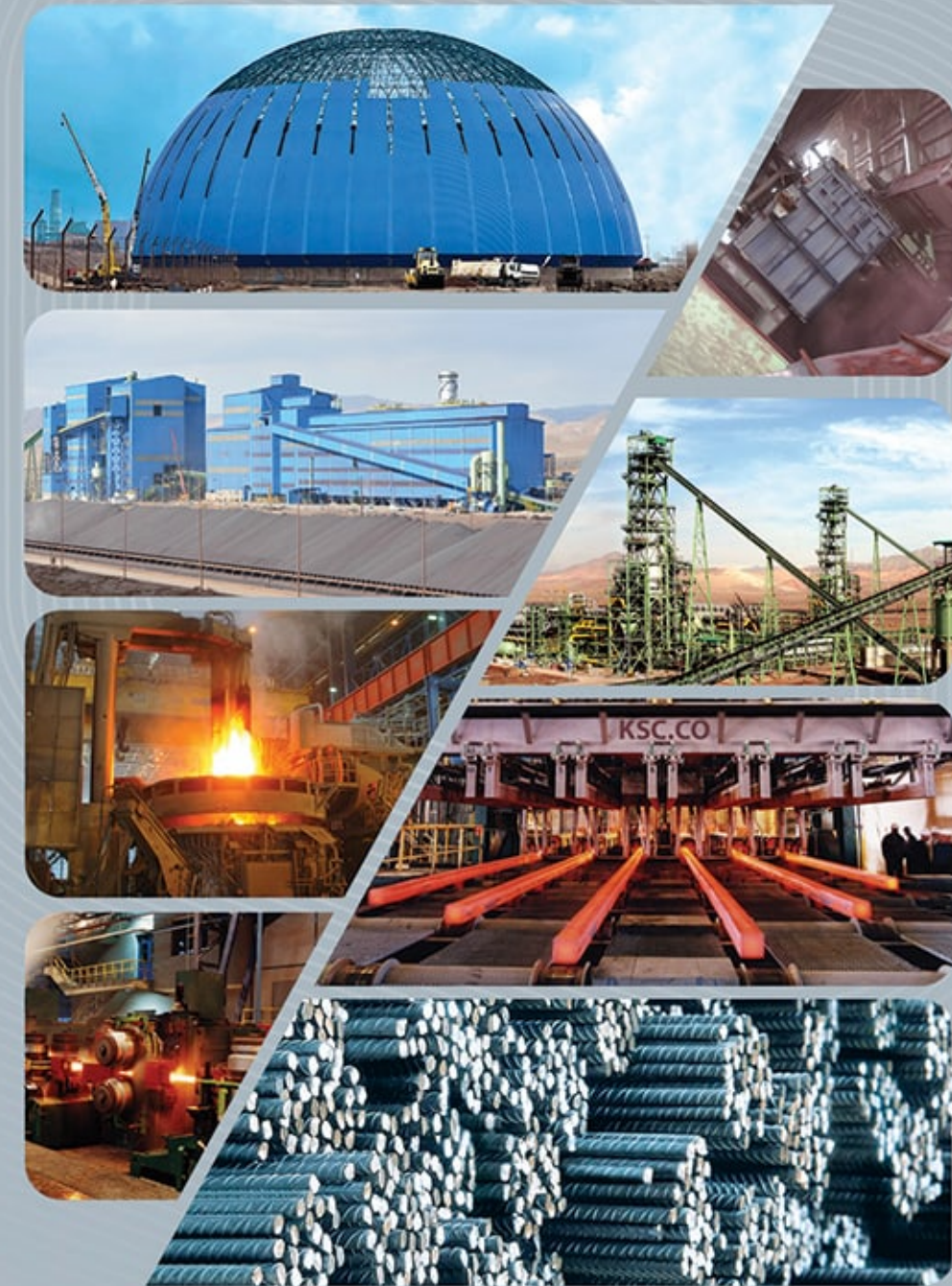
Khorasan Steel Complex Co.



Khorasan Steel Complex Company

Khorasan Steel Complex was established as the largest integrated steel complex in the east of the country, 15 kilometers northwest of Neishabur and on an area of 1400 hectares, in accordance with the economic policy of the Islamic Republic of Iran on the basis of industrial self-sufficiency and independence from strategic products and includes about 70 thousand tons of all types of machinery and equipment. Currently in operation are a pelletizing plant with a production capacity of 2.5 million tons per year, two direct reduction plants with a capacity of 800,000 tons/year each, two steel mills with capacities of 630,000 and 720,000 tons/year, and a rolling mill for light structural steels with a capacity of 550,000 tons/year. In addition, a concentrate production plant with a capacity of 2.5 million tons per year is being built at the Sangan iron ore mine in the city of Khaf.

Khorasan Steel has been among the top 100 companies in Iran in recent years in terms of effectiveness on the national and local economy, and is also one of the country's leading companies in the field of manufacturing and production (at the crystal statue level of the country's National Award for Organizational Excellence). Khorasan Steel Complex consists of 18 different facilities, including five pelletizing, DRI, smelting, casting and rolling facilities, the rest are auxiliary and ancillary facilities. It is worth noting that Khorasan Steel Company has set a target of achieving a steel production capacity of 3.5 million tons in line with the country's comprehensive steel plan (achieving a production of 55 million tons in 2025 Perspective). In this complex, the iron ore extracted from the mines, after grinding, is concentrated by various industrial processes, and the iron grade in the concentrate is increased. After processing in pelletizing plant, the concentrate is pelletized together with additives into balls with a diameter of 9-16 mm. The pellet as the main feedstock for the DRI plant in the reduction process, is melted and finally processed into the final product.





Khorasan Steel Company 2025 Perspective

One of the largest integrated steel companies in the country and the region with a production capacity of:

- 5 million tons of iron ore concentrate
- 5 million tons of pellets
- 3.5 million tons of sponge iron
- 3.5 million tons of crude steel
- 1.3 million tons of rolled products

Mission:

Production of all types of structural steels, using the latest technologies and a high-performance human capital, respecting environmental constraints, in line with the added value of the beneficiaries and the economic and industrial development of the region and the country.

Values of the organization:

Customers: Reverence, satisfaction, responsibility, and integrity

Employees: Respecting human dignity, participation, increasing motivation and promoting health

Partners and suppliers: Enhancing capabilities and win-win relationship

Shareholders: Safeguarding interests and accountability

Society: Interaction, trust and collaboration

Governance and upstream organizations: Interaction and accountability

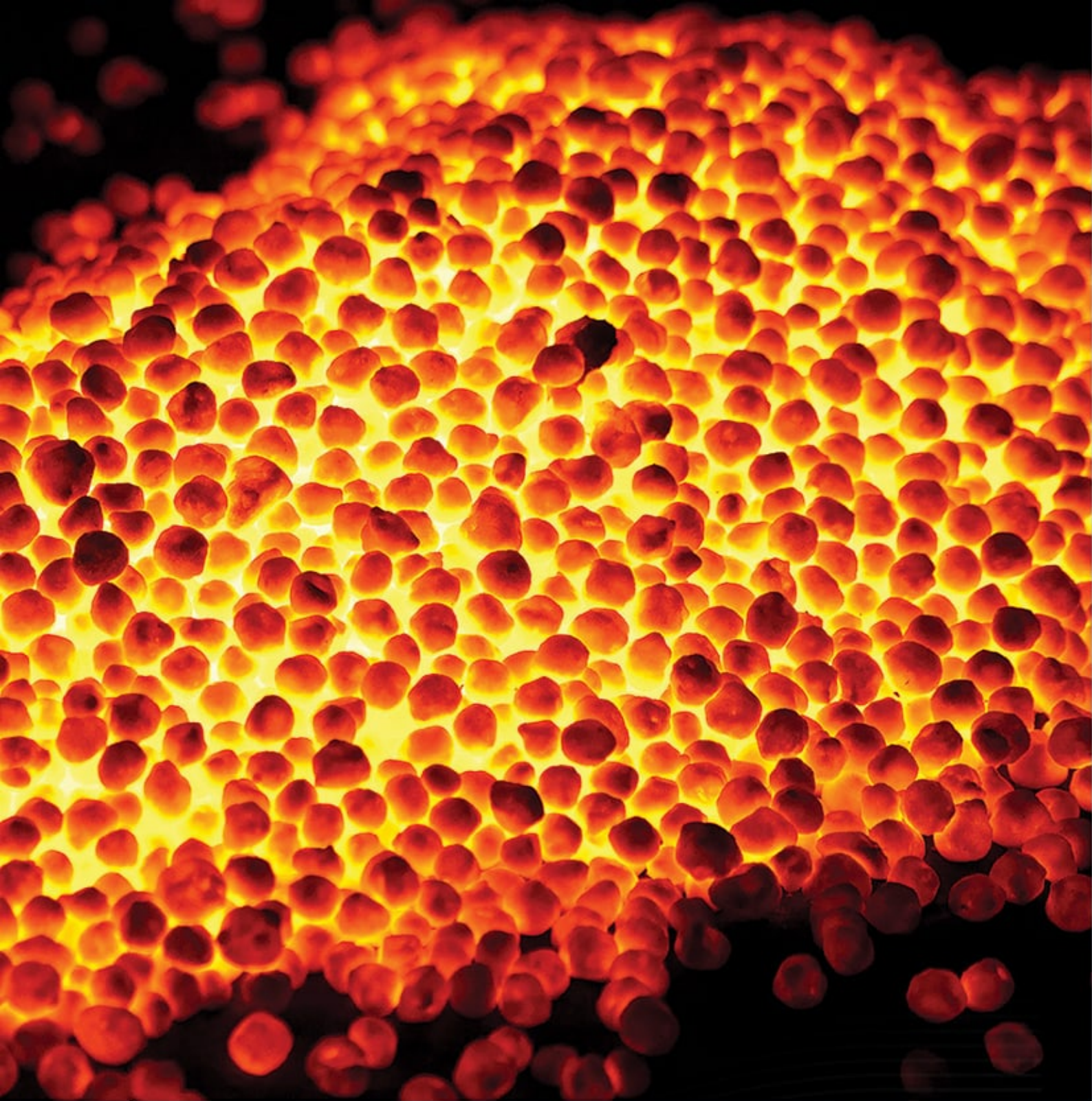
Organizational processes: Knowledge-based, group work and continuous improvement



Pelletizing Plant

In this plant, after the concentrate is crushed in ball mill and mixed with additives such as bentonite, lime, sodium hydroxide and water, it is put into mixer to mix with filter cake and slurry, and then this paste composition is fed to the green pelletizing area by the conveyor belt. The paste is transformed into spherical green pellets by special discs. After the sizing process, the pellets of suitable size are fed to the indurating machine. Allis-Chalmers and Lurgi are two important firing methods for pelletizing, and in this plant, firing is done by the traveling grate (Lurgi) method. After passing through the drying, preheating, and firing zones, the green pellets are fired on the traveling grate under the heat of the burners, and after passing through the cooling zone, they are removed from the kiln as fired pellets to be transported by conveyor belts to the direct reduction plant, after screening.





Specifications of pellets produced in Khorasan Steel Complex



Chemical & physical Composition

Row	Item	Test Method	Result (The Most of Abundance)
1	Fe(Total)	ISIRI 12173-1	65-66.5 (%)
2	FeO	INSO 17001	0.3-0.7 (%)
3	S	ISO 4935	0.004 – 0.013 (%)
4	SiO ₂	ISO 9516	2.5-3.5(%)
5	CaO	ISO 9516	0.7-1.0 (%)
6	MgO	ISO 9516	0.6-1.1 (%)
7	Porosity	ASTM C20	22 -25 (%)
8	T Index	ISIRI 1267	95-96.5 (%)
9	A Index	ISIRI 1267	2.5-4.0 (%)
10	C.C.S	ISO 4700	250-350 (Kgf)
11	8-16 mm	ISIRI 4977	84-94 (%)



Direct Reduction Plant

The pellet (iron oxide) taken from the tanks daily, after entering the direct reduction furnace, is deoxidized by the Midrex method near CO and H₂ reduction gas and at a temperature of 760 degrees Celsius, and sponge iron (DRI) is produced. The produced sponge iron is transported from the bottom of the furnace by conveyor belt to the Product Bin with a capacity of 7000 tons. The process of conversion of natural gas (CH₄) into reducing gas takes place in the reformer, which consists of 468 pipes, at a temperature of 1100 degrees Celsius and near the catalyst. From the chemical point of view, at the above temperature, the reducing gas can absorb the oxygen of the iron ore, and the reduction content (metallization ratio) in the final product of the reduction plant increases. The sponge iron produced by this process is a suitable alternative to scrap iron as the main raw material for electric arc furnaces.

Cold Briquette Production Plant

The fine sponge iron produced in the direct reduction plant is transformed into compact and transportable briquettes with the help of additives to enable the feeding of steel mills, and the production of this product prevents the release of sponge dust into the environment.

Specifications of sponge iron

Chemical & physical Composition			
Row	Item	Test Method	Result (The Most of Abundance)
1	Fe(Total)	INSO 12173-1	85- 87.5(%)
2	Fe(Metal)	IS 15774	78 - 82 (%)
3	MD	----	91 - 94 (%)
4	SiO2	ISO 9516	3.5-5.0 (%)
5	CaO	ISO 9516	1.0-1.3 (%)
6	MgO	ISO 9516	0.9-1.5 (%)
7	Al2O3	ISO 9516	1.0-1.5 (%)
8	C	INSO 14769	1.7-2.4 (%)
9	S	INSO 14769	0.004 - 0.013 (%)
10	P	INSO 5806	0.04-0.07 (%)
11	-6.3 mm	ISIRI 4977	5-10 (%)
12	+16 mm	ISIRI 4977	Max 3 (%)
13	Bulk Density	ISIRI 4977	1.7 (ton/m3)





Steel making & continuous casting Plant

The sponge iron (DRI) stored in the Product Bin, is converted into molten steel together with the scrap via the conveyor belt using electricity (120 MVA) in a 110-ton electric arc furnace (EAF).



The molten steel is then transferred to the ladle furnace (LF) to add various additives and adjust the thermal factors to achieve the desired properties. In this plant, scrap and sponge iron can be used as raw material. The molten steel ready for casting can be processed into standard steel billets with cross sections of 130x130, 150x150 and 180x180 mm in various lengths on 6 continuous casting lines. The annual nominal production capacity of steel mill No. 1 is 630,000 tons of steel billets per year, and this mill is currently producing 700,000 tons per year. The annual nominal production capacity of steel plant No. 2 is 720,000 tons per year. A special feature in the production process of these two mills is the control of the melt split between the castings of steel mills 1 and 2, which plays an important role in the quality of billet production.



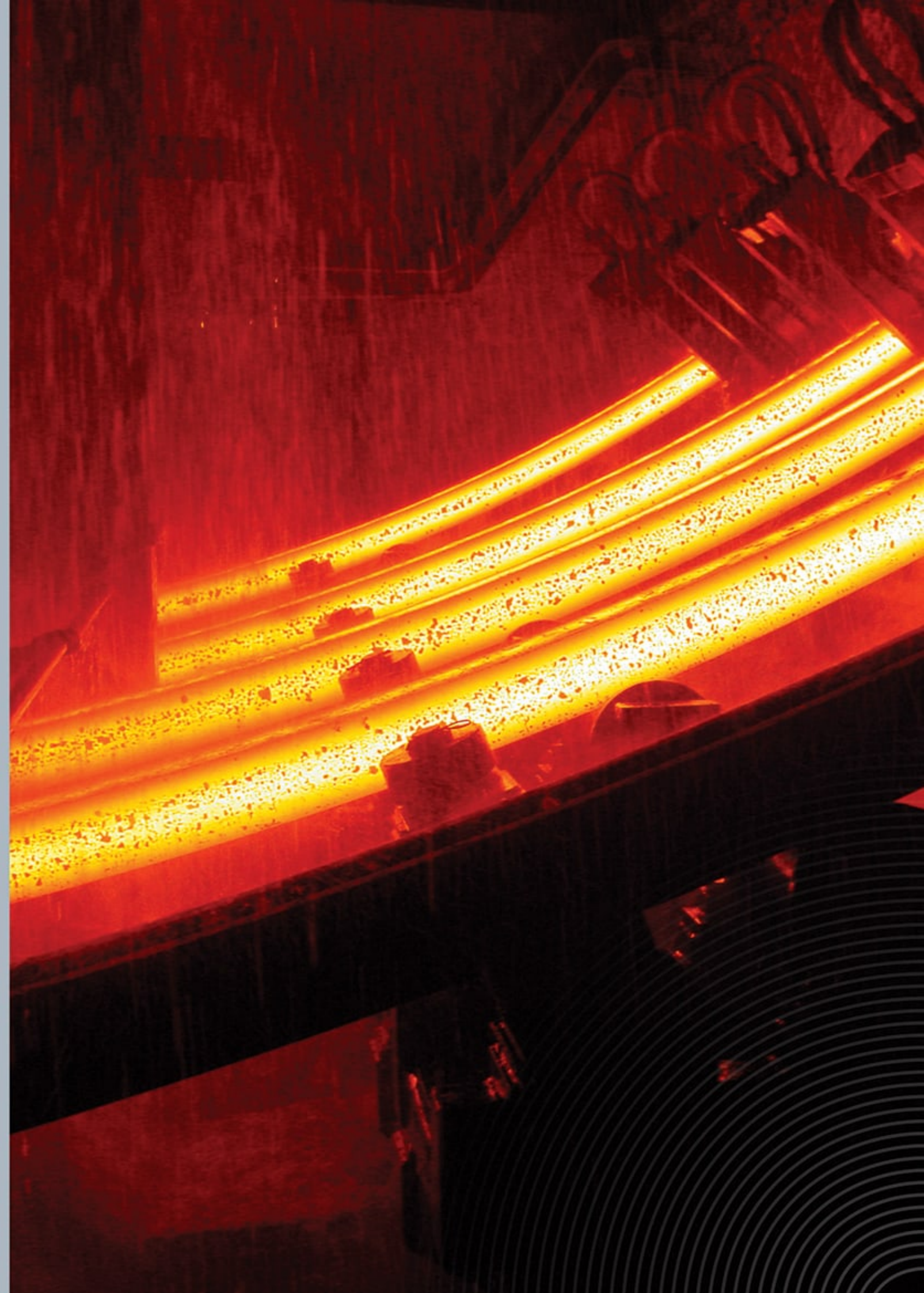
continuous Casting Plant

The molten steel ready for casting can be processed into standard steel billets with cross sections of 130*130, 150*150 and 180*180mm and in various lengths on 6 continuous casting lines. The nominal capacity of crude steel production of the complex, including the two steel mills, is currently one million three hundred and fifty thousand tons. No.1 steel plant exceeds its nominal capacity and produces more than 720,000 tons/year of steel billets, and steel plant No. 2 also reaches more than 630,000 tones/year of its nominal capacity by passing through the first phases.

Technical Specification of Steel Billet

Weight per length (kg/m)		Cross Section(mm)					
131.4		130×130					
173.3		150×150					
256.7		180×180					
Standard Equivalent	Max CEV	Chemical Composition (% mass)					
		The Max. Value		%Mn	%Si	%C	
		%S	%P				
GOST	5SP	0.50	0.045	0.040	0.50-0.80	0.15-0.30	0.28-0.37
	4SP	0.42	0.045	0.040	0.40-0.70	0.15-0.30	0.18-0.27
	3SP	0.35	0.045	0.040	0.40-0.65	0.15-0.30	0.14-0.22
DIN	St60-2	0.59	0.045	0.045	0.50-0.80	0.15-0.30	0.35-0.45
	St50-2	0.49	0.045	0.045	0.50-0.80	0.15-0.30	0.25-0.35
	St44-2	0.40	0.045	0.045	0.50-0.80	0.15-0.35	0.14-0.22
	St37-2	0.30	0.045	0.045	0.40-0.65	0.15-0.30	0.12-0.17
INSO 20300	R3	0.51	0.040	0.040	0.65-1.60	0.15-0.55	0.20-0.25
	R4-B	0.52-0.60	0.045	0.045	0.80-1.60	0.15-0.60	0.28-0.37
	R8	0.42-0.50	0.045	0.045	0.50-0.90	0.15-0.35	0.28-0.37

Product analysis can be negotiated based on customer request





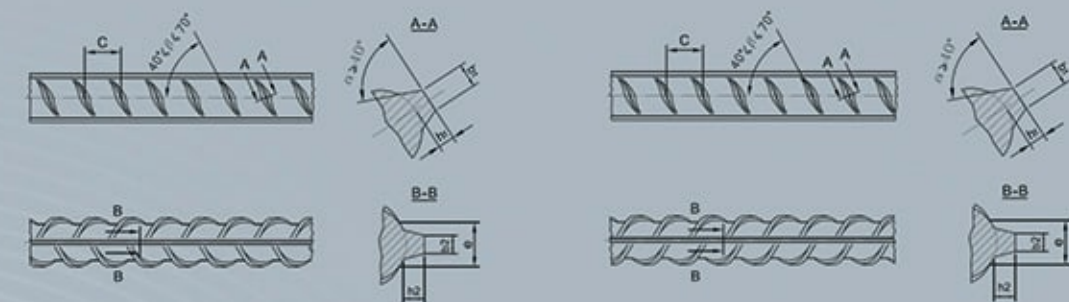
Hot Rolling Mill

Billets produced in the casting plant, after being placed in the preheated furnace and reaching the desired temperature, are transformed into steel products by passing through up to 20 rolling stands installed vertically and horizontally in the same direction. One of the most important features of this plant is the use of the most advanced technology, which allows high speed and change of billet cross-section in the shortest possible time. The plant has a heat treatment line, cooling bed, straightening line, packing line, enumeration and weighing line. The annual production capacity of this unit is 550,000 tons of light structural steels, including: plain and screw-thread ribbed bars, angle, U- sections, strap, square and hexagonal sections, packed in standard form and delivered to the market after sampling and quality control. It should be mentioned that a production record of 640,000 t/year of steel end products was achieved in this unit.



All Rebars Produced

Bars manufactured by Khorasan Steel Complex are classified into 4 groups including plain rebar (grade 240), Spiral reinforcement bar (grade 340), Herringbone ribbed bar (grade 400) and ribbed compound bars (grade 500) in accordance with Iran's national standard 3132 (revised on June 23, 2013 – hot rolled rebar used for concrete reinforcement – specifications and testing methods). Khorasan Steel Complex is capable of producing herringbone ribbed bars and ribbed compound bars using the Quench-Temper heat treatment process to improve mechanical properties. Considering the obligation to obtain the standard for the production of bars in accordance with the Iranian standard No. 3132, the company managed to obtain the license for the use of the mandatory standard mark in September 2002. The mentioned license for the production of 340, 400 and 500 grade plain and ribbed bars has been renewed every year so far after the experts of the Standards Organization took samples of the bars produced and conducted regular inspections of the products in the company and throughout the country (Taha) and verified the compliance of all said samples with the standards. The rebar produced by Khorasan Steel complies with the mechanical properties of the standard BS 4449 (B500B) and the mechanical properties of the standard GOST 5781 (A- III (A400) & A-I(A240)).



Specification of Round bar produced based on the INSO 3132

Mechanical Properties					
Classification	Characteristic sign	Tensile Test			
		Min of Yield Strength N/mm ²	Min of Tensile Strength N/mm ²	Min of Tensile/yield strength ratio	Min. Relative Elongation (A5)
Round	240	240	360	1.25	25

Max Chemical Composition (% mass)							
Classification	Characteristic sign	C	Si	Mn	P	S	Max CEV
Round	240	0.22	0.55	0.75	0.050	0.050	-

Geometric and weight specification						
Nominal Diameter (mm)	Tolerance (%)	Diagonal changes	Nominal Size (mm)	Calculated weight of one meter (Kg/m)	Tolerance (%)	Nominal Cross section (mm ²)
Less than 22	+0/3 -0/5	The difference between the minimum and maximum diameter (ovality) should be within 70% of the tolerance range	10	0.616	± 5	78.5
			12	0.888		113
			14	1.210		154
16	1.580		201			
18	2.000		254			
20	2.470		314			
From 22 to 28	+0/4 -0/5		22	2.980	380	
			25	3.850	491	
			28	4.830	616	
From 28 to 50	+0/4 -0/7		32	6.310	804	
		36	7.990	1018		
		40	9.870	1257		

Specification of ribbed bar produced based on the INSO 3132

Mechanical Properties					
Classification	Characteristic sign	Tensile Test			
		Min of Yield Strength N/mm ²	Min of Tensile Strength N/mm ²	Min of Tensile/yield strength ratio	Min of Elongation (A5) (%)
Screw-thread ribbed bar	Aj 340	340	500	1.25	18

Max Chemical Composition (% mass)							
Classification	Characteristic sign	C	Si	Mn	P	S	Max CEV
Screw-thread ribbed bar	Aj 340	0.32	0.60	1.30	0.045	0.045	0.050

Geometric and weight specification			
Nominal Diameter (mm)	Nominal Cross section (mm ²)	Calculated weight of one meter (Kg/m)	
		Nominal	Tolerance (%)
10	78.5	0.616	± 6
12	113	0.888	
14	154	1.210	
16	201	1.580	± 5
18	254	2.000	
20	314	2.470	
22	380	2.980	
25	491	3.850	
28	616	4.830	± 4
32	804	6.310	

Specification of ribbed bar produced based on the INSO 3132

Mechanical Properties					
Classification	Characteristic sign	Tensile Test			
		Min of Yield Strength N/mm ²	Min. Tensile Strength (N/mm ²)	Min of Tensile/yield strength ratio	Min. Relative Elongation (A5)
Ribbed bar	Aj 400	400	600	1.25	16

Max Chemical Composition (% mass)							
Classification	Characteristic sign	C	Si	Mn	P	S	Max CEV
Ribbed bar	Aj 400	0.37	0.60	1.60	0.045	0.045	-

Geometric and weight specification			
Nominal Diameter	Nominal Cross section	Calculated weight of one meter (Kg/m)	
(mm)	(mm ²)	Nominal	Tolerance (%)
10	78.5	0.616	± 6
12	113	0.888	
14	154	1.210	± 5
16	201	1.580	
18	254	2.000	
20	314	2.470	
22	380	2.980	
25	491	3.850	± 4
28	616	4.830	
32	804	6.310	

Specification of ribbed bar produced based on the INSO 3132

Mechanical Properties					
Classification	Characteristic sign	Tensile Test			
		Min of Yield Strength N/mm ²	Min. Tensile Strength (N/mm ²)	Min of Tensile/yield strength ratio	Min. Relative Elongation (A5)
compound ribbed	Aj 500	500	650	1.25	10

Max Chemical Composition (% mass)							
Classification	Characteristic sign	C	Si	Mn	P	S	Max CEV
compound ribbed	Aj 500	0.40	0.60	1.80	0.045	0.045	-

Geometric and weight specification			
Nominal Diameter	Nominal Cross section	Calculated weight of one meter (Kg/m)	
(mm)	(mm ²)	Nominal	Tolerance (%)
10	78.5	0.616	± 6
12	113	0.888	
14	154	1.210	± 5
16	201	1.580	
18	254	2.000	
20	314	2.470	
22	380	2.980	
25	491	3.850	± 4
28	616	4.830	
32	804	6.310	

ISO 10015 (2019)

The implementation of the International Standard for Quality Management and Training at

The said standard is achieved with the approach of human resources development after documentation and the establishment of specialized committees, and the corresponding certification is renewed every year and in December 2010 by SGS.

In 2022, Khorasan Steel Company succeeded in updating the edition of the said standard to the 2019 edition with the approach of competence management at individual, team/group and organizational levels, after documentation and establishment of specialized committees and conducting an audit by a third party, SGS.



ISO 9001 (2015)

Implementation of the international standard for quality management

The implementation of the said standard with the approach of customer satisfaction, after public training, documentation and final examination of the relevant certificate was issued in July 2004, and Khorasan Steel Company succeeded in updating the edition of the said standard to the 2015 version after a third-party audit was conducted by SGS, in 2017.



ISO 10002 (2018)

The implementation of the standard for customer complaint management

The aim of this standard is to develop an effective and efficient customer complaint handling system in all business enterprises and help organizations, customers and all interested parties/stakeholders.

Khorasan Steel Complex has implemented this standard and successfully obtained the certificate for this standard from SGS in 2018.

ISO 14001 (2015)

The implementation of the international standard for environmental management

The implementation of the said standard with the approach of community satisfaction was granted in September 2005 after public and technical training, documentation and final verification of the corresponding certificate. Based on the requirements of this standard, the environmental aspects arising from the company's activities and the corresponding control measures are identified, and the system is controlled through regular measurements.



ISO 10004 (2018)

The implementation of customer satisfaction management

In order to monitor and measure customer satisfaction, Khorasan Steel Complex has implemented this standard and successfully obtained the certificate of this standard from SGS in 2018.



ISO 45001 (2018)

The implementation of the international standard for occupational health and safety management

Based on the requirements of this standard, occupational health and safety risks that endanger the health of employees are identified, and appropriate control programs are established and implemented for each risk.

Khorasan Steel Company has successfully updated the edition of the said standard to the version ISO 45001 after conducting a third party audit by SGS in 2018.



ISO/IEC 17025 (2017)

The implementation of the international standard for laboratory quality management

In order to increase customer satisfaction and at the same time improve quality, Khorasan Steel Company has established specialized laboratories, from the receipt of raw materials in the production process to the delivery of the final product to the customer. In this regard, the company has succeeded in obtaining the certificate of a partner laboratory (Acrodity) from the General Department of Standard of Khorasan Razavi Province for rolling, steelmaking, chemical and fluids laboratories.

IEC/ISO 17025 laboratory quality management certificate for metallurgical laboratory (rolling, steelmaking and direct reduction laboratory) was issued by National Certification Center of Iran.

ISO 50001 (2018)

The implementation of the international standard for energy management

Khorasan Steel Complex has obtained the above certificate to improve performance and reduce energy consumption.



GOST



BS4449



Iranian National Standard 3132



KSC.CO

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