

KOBELCO

FOUNDRY PIG IRON



KOBE STEEL, LTD.

Kobe Steel's Foundry Pig Iron

With its diverse and sophisticated casting technology, foundry pig iron of better quality and higher reliability is in demand. Kobe Steel manufactures foundry pig iron at its Kakogawa Works using blast furnace facilities and operating techniques of the world's highest levels, as well as carefully chosen raw materials. Through a production system based on strict inspections and comprehensive quality control at the works, Kobe Steel is doing its utmost to manufacture reliable foundry pig iron with superior quality that gives a sense of security to customers, and even uses that phrase as its slogan.

Characteristics

Comprehensive Quality Control

The raw materials with which Kobe Steel charges its blast furnaces are produced by combining different types of ore in the proper quantities according to specifications. These materials go through particularly strict advance processing and comprehensive management, and have passed stringent inspections. When the final product is delivered, an analysis table listing the chemical compositions is attached, which is very useful for the management of chemical compositions.

Stable Compositions with Few Trace Elements

Pig iron manufactured with carefully chosen raw materials and cutting-edge measuring management operations that cause less chemical composition variations and is the best way to control trace elements.

Convenient Shape for Use

Weight per pig iron is about 5 kilograms. Kobe Steel's pig iron comes in convenient shapes that require no division for use.

Kakogawa Works



Blast furnace



Casting machine



A Hot Drama in a Blast Furnace

A blast furnace is a large reactive container. In this complex countercurrent reactive container, a carbon monoxide gas (a reducing agent) rises from below, iron ore (an oxide) and coke drop from above, and the three phases of solid, liquid, and gas coexist.

The ascending gas causes the temperature of the iron ore to rise to 800 degrees C in the granular zone. Then, the iron ore enters the softening and fusible zone. Pieces of iron ore softened at a temperature between 1,000 degrees C and 1,200 degrees C mix and stick to each other in this zone. Charged coke and iron ore remain in layers until this zone. Iron ore (an oxide) deoxidizes into iron and the melted iron falls through the dripping zone like rain and accumulates at the bottom at 1,500 degrees C.

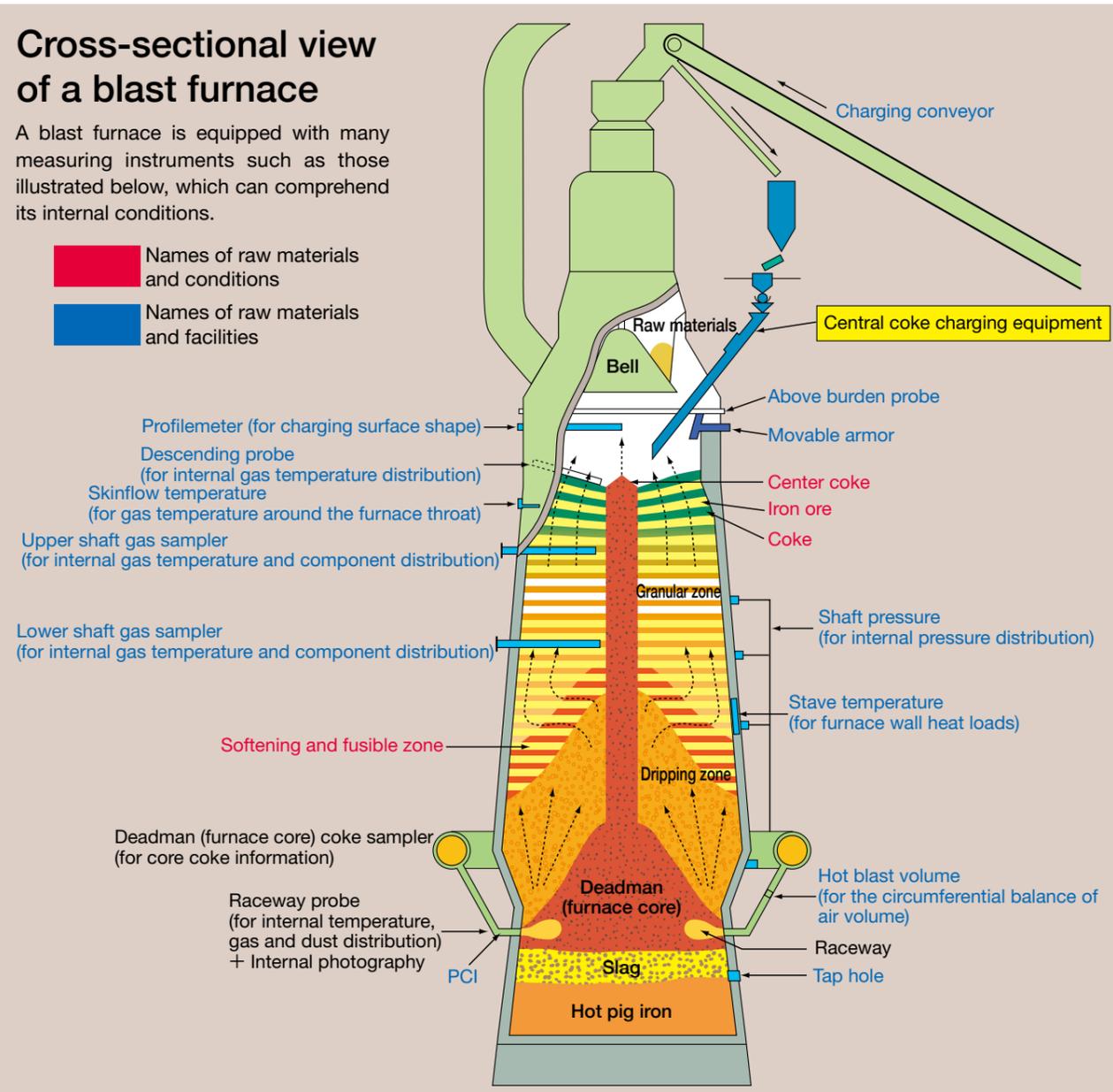
In the meantime, hot air at the temperature of 1,200 degrees C is blown in with pulverized coal through tuyeres, which burns the coke and pulverized coal in raceways, changes into a 2,000 degree C carbon monoxide gas and

moves up. The gas travels through the rain of molten iron in the dripping zone and then passes through the softening and fusible zone which is the most difficult zone for gases to go through. In this zone, the gas travels through a coke layer between pieces of iron ore that have stuck together. Carbon monoxide gas is also reproduced through a solution loss reaction that transforms carbon monoxide first into carbon dioxide and then back into carbon monoxide. The gas leaves the blast furnace from the top as a blast furnace gas containing fifty-fifty carbon monoxide and carbon dioxide at the temperature of 200 degrees C after deoxidization of the iron ore in the granular zone.

Cross-sectional view of a blast furnace

A blast furnace is equipped with many measuring instruments such as those illustrated below, which can comprehend its internal conditions.

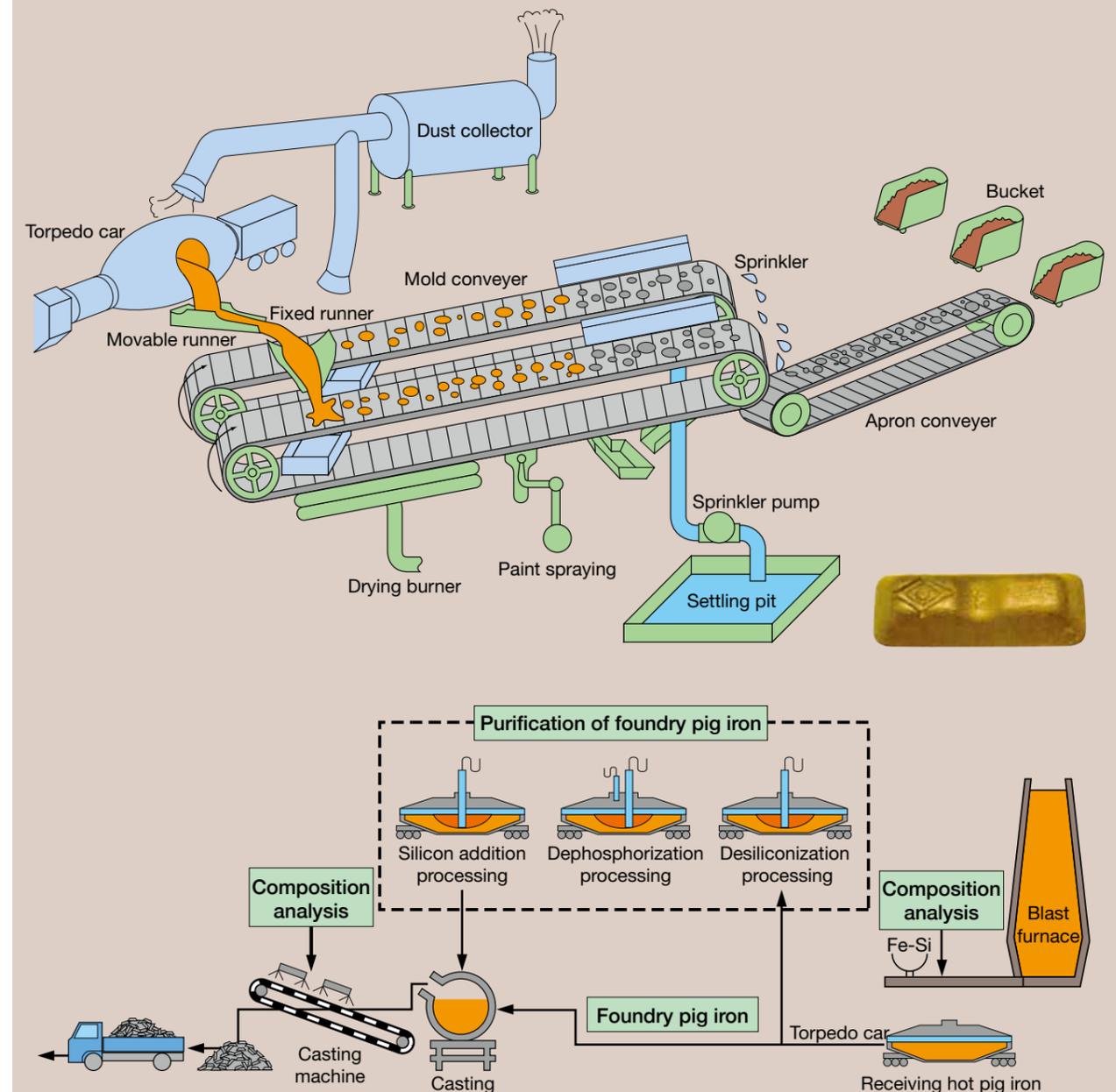
- Names of raw materials and conditions
- Names of raw materials and facilities



Manufacturing Superior Foundry Pig Iron Based on Hot Pig Iron

Kobe Steel manufactures foundry pig iron of high quality by dephosphorizing and desulfurization of the hot pig iron. Our foundry pig iron are used widely for a various fields of castings in the manufacturing industry.

Manufacturing processes flow of foundry pig iron



Composition Specifications for Foundry Pig Iron and Real Values

As of April 1, 2020

Large classifications	Medium classifications	Small classifications	Pig iron grade	Compositions	C	Si	Mn	P	S	Cr
Normal pig iron	Gray cast iron	Former JIS standard	F1-1B	Specifications	≥3.40	1.81-2.20	≤0.50	≤0.150	≤0.045	-
				Real values	4.2	2.0	0.30	0.120	0.010	-
		F1-1C	Specifications	≥3.30	2.21-2.60	≤0.50	≤0.150	≤0.045	-	
			Real values	4.1	2.4	0.30	0.120	0.010	-	
		Low-silicon	F-E1	Specifications	≥4.00	1.00-1.40	≤0.50	≤0.150	≤0.060	-
				Real values	4.3	1.2	0.30	0.120	0.010	-
		No silicon added	F-NH	Specifications	≥3.50	≤1.20	≤0.50	≤0.150	≤0.050	-
				Real values	4.6	0.4	0.30	0.120	0.010	-
High-purity pig iron	Ductile cast iron	EP (silicon added)	F3-EP (normal)	Specifications	≥3.50	0.80-1.20	≤0.20	≤0.030	≤0.020	≤0.035
				Real values	3.7	1.0	0.10	0.020	0.005	0.005
		F1-EPM (high-silicon)	Specifications	≥3.50	1.60-2.00	≤0.30	≤0.040	≤0.030	≤0.050	
			Real values	3.7	1.8	0.10	0.020	0.005	0.035	
		F3-EPLS (low-sulfur)	Specifications	≥3.50	0.80-1.20	≤0.20	≤0.030	≤0.008	≤0.035	
			Real values	3.7	1.0	0.10	0.020	0.002	0.005	
		SP (low-silicon)	F3-SP (normal)	Specifications	≥3.50	≤0.30	≤0.20	≤0.030	≤0.020	≤0.035
				Real values	3.8	0.20	0.10	0.020	0.005	0.005
		F3-SPLS (low-sulfur)	Specifications	≥3.50	≤0.30	≤0.20	≤0.030	≤0.006	≤0.035	
			Real values	3.8	0.20	0.10	0.020	0.002	0.005	

*Real values presented above are reference values as they are updated every month.

Please forward your inquiries about foundry pig iron to Kobe Steel using the hyperlink provided below.

[Go to the Inquiry Sheet.](#)

*The hyperlink above takes you to the official website of Kobe Steel.