


鑄物用銑鉄 Foundry Pig Iron



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鋳物用銑鉄

鋳物用銑鉄は、鋳鉄鋳物の成分に最も近い原料であり、ほかの原料では得られない鋳鉄特有の性質を付与するものです。日本製鉄の鋳物用銑鉄は、多種類の原料鉄鉱石のなかから最適な鉱石を最新鋭高炉に集中配合するとともに、厳しい吹製目標をさだめ、徹底した品質管理のもとに製造したものです。有害微量成分はもちろん、成分変動の少ない安定した良質鋳物用銑鉄として、安心してご使用いただけます。

Foundry Pig Iron

Foundry pig iron is very similar in composition to castings. It also imparts to castings certain performance characteristics peculiar to cast iron, which cannot be obtained from other materials. The foundry pig iron supplied by Nippon Steel is produced using an advanced blast furnace. For this task, only the most suitable iron ores are selected from the many grades available. At the same time, the production of foundry pig iron is carried out by fixing several refining targets and assuring thoroughgoing quality control. Foundry pig iron produced in this manner can be reliably used in the manufacture of castings with uniform and stable quality that not only include fewer impurities but also exhibit fewer deviations in composition.

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日本製鉄 鋳物用銑鉄の特長

Features of Nippon Steel's Foundry Pig Iron



1

高い純度

30種類以上の鉄鉱石の中から不純物の少ないものを鋳物用銑鉄製造時の高炉原料として厳選吹錬した純度の高い鋳物用銑鉄です。

High Purity

As the blast furnace raw material for producing foundry pig iron, Nippon Steel only uses iron ore with fewer impurities, which is carefully selected from among more than 30 different types of iron ore. The end result is high-purity foundry pig iron.

2

広範なスペック保証

近年の高強度鋼板の使用拡大に伴い、銑鉄鋳物の主原料の一つである鋼屑中に鋳物にとって有害な元素 (Ti、Cr、Vなど) の含有量が増加しています。そこで、広範な元素について成分規格を設け、これらの有害元素についても極めて低い含有率であることを保証した鋳物用銑鉄です。

Wide-ranging Specifications

Steel scrap is one of the other major materials used in producing cast iron products. With the recent growth in use of high-strength steel plates and sheets, the inclusion in the scrap of alloying elements (Ti, Cr, V, etc.), which are harmful for castings, is also increasing. To deal with this, composition specifications for a wide range of elements are prepared. As a result, extremely low concentration of these harmful elements is guaranteed for Nippon Steel's foundry pig iron.

3

幅広い用途に対応可能な商品メニュー

製造される鋳物製品、ならびにご要望の成分量に応じた鋳物用銑鉄をご利用いただけます。

Rich Variety of Grades

Foundry pig iron suitable for each foundry products, and required chemical composition can be selected.

4

コンパクトな形状

キューバラ炉での通気性を確保し、単重5kg/個で、高嵩密度、高充填密度、小さな比表面積のコンパクトな形状を実現することにより、電気炉での溶解時間短縮、溶解電力低減、スラグ発生量軽減等によるコスト削減・生産性向上に効果を発揮します。

Rich Variety of Grades

Nippon Steel's foundry pig iron weighs 5 kg/ingot of pig iron and features high bulk density, high packing density and compact size with small specific area, which allow improved operations of electric furnaces—maintaining of permeability for use in cupola furnaces, reduction in melting time and in consumption of electricity in melting and decreased generation of slag. These factors result in real cost reductions and productivity improvements at user plants.

5

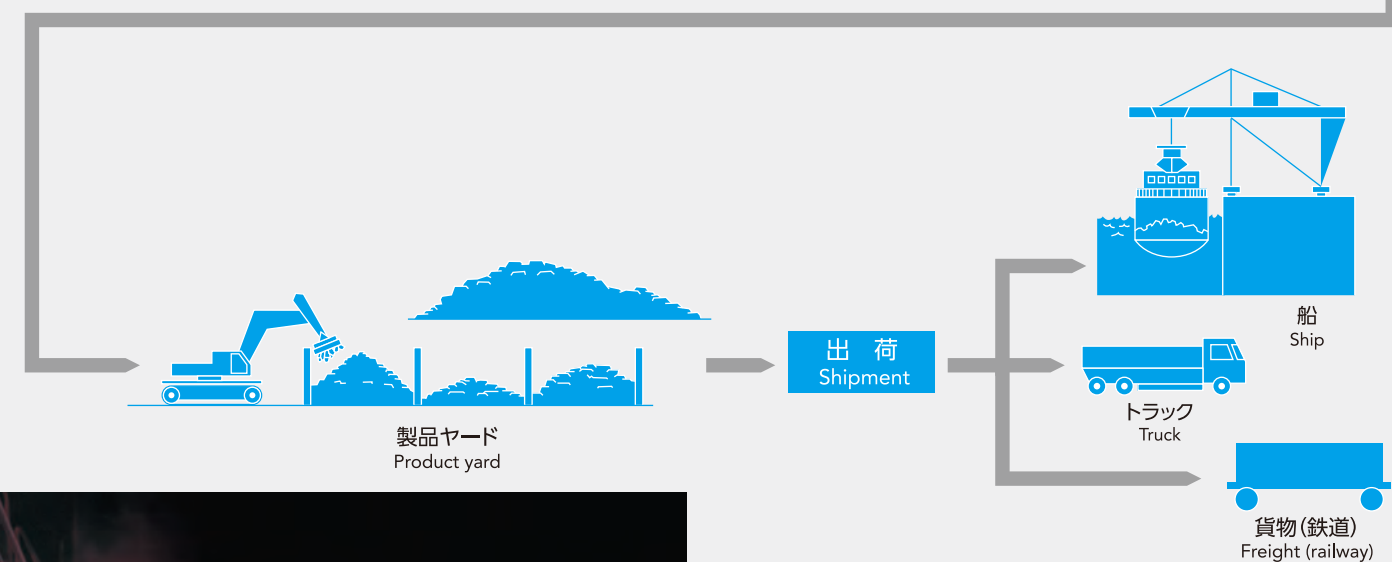
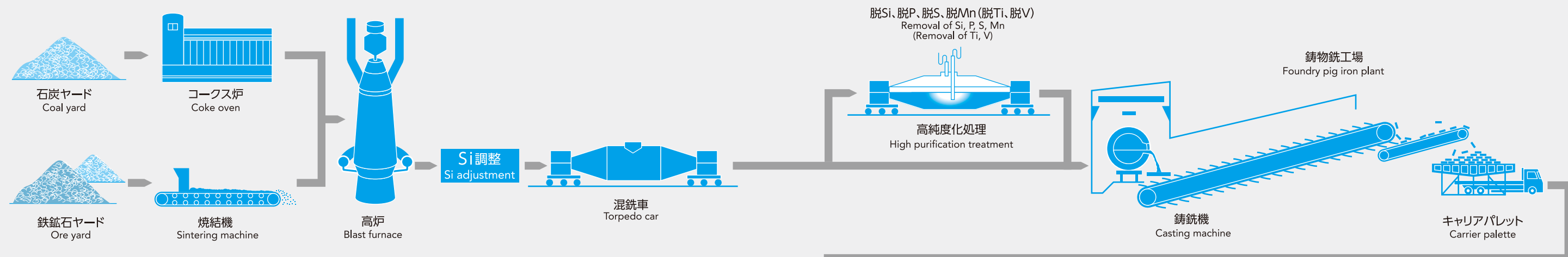
安定品質

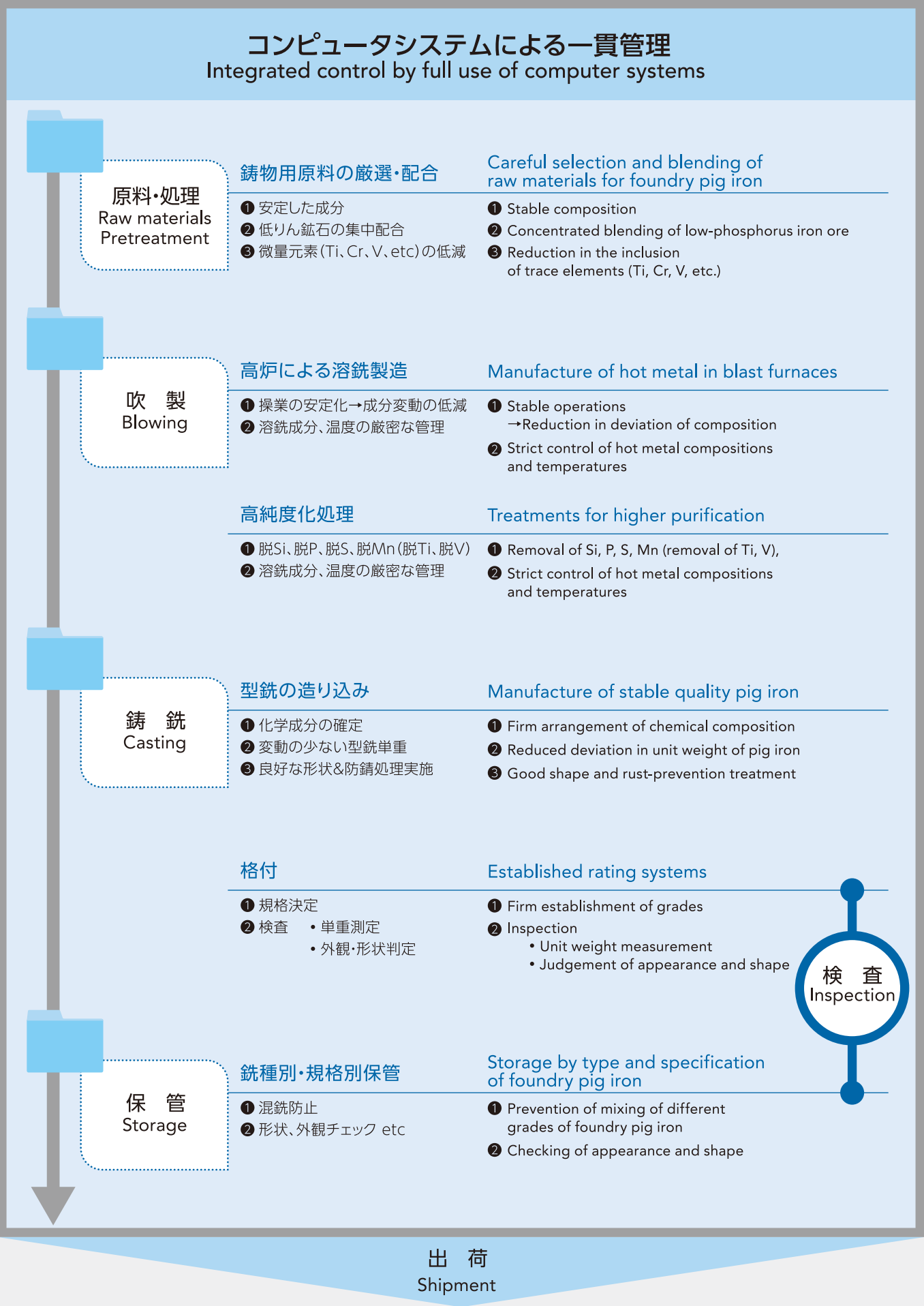
最新鋭高炉での吹製管理、銑鉄操業管理、厳格な製品保管等の徹底により、成分変動の少ない安定した品質の鋳物用銑鉄を提供いたします。その他、形状、錆についても徹底した管理を行っており、安心してお使いいただけます。

Stable Quality

Nippon Steel's foundry pig iron maintains stable quality and reduced deviation in composition through thoroughgoing control of blowing in advanced blast furnace and casting operations as well as by maintaining the strictest product storage conditions. Also, thorough quality control procedures are applied to dimensions, rust prevention and other important factors. All this guarantees the reliability of Nippon Steel's foundry pig iron.

製造工程 Production Process





鉄種別規格表
Specifications for Chemical Composition

鉄 種 Type	規格略号 Symbol of specifications	C	Si	Mn	P	S	Ti	Cr	As	V
		(1/100)	(1/100)	(1/100)	(1/1000)	(1/1000)	(1/1000)	(1/1000)	(1/1000)	(1/1000)
多機能型 鑄物用鉄鉄 (通称: 多機能鉄8規格) Multi Functional Foundry Pig Iron	FGD-N	340~∞	60~100	0~30	0~100	0~50	0~65	0~30	0~10	
	FGD-1	340~∞	101~180	0~30	0~100	0~40	0~65	0~30	0~10	
	FGD-2	340~∞	181~220	0~30	0~100	0~40	0~65	0~25	0~10	
	FGD-3	340~∞	221~260	0~30	0~100	0~40	0~65	0~30	0~10	
	FGD-4	340~∞	261~299	0~30	0~100	0~40	0~65	0~30	0~10	
	FGD-T	375~420	300~360	0~30	0~100	0~40	0~70	0~30	0~10	
	LSD	340~∞	50~100	0~25	0~90	0~ 7	0~65	0~25	0~10	
	FLMS	340~∞	80~160	0~30	0~90	0~ 7	0~65	0~30	0~10	
	N-FE	340~∞	0~ 99	0~30	0~100	0~50	0~65	0~30	0~10	
高純度 鑄物用鉄鉄 (通称: 高純度鉄9規格) Super Ductile Foundry Pig Iron	DUCS-2X	360~386	0~ 10	0~10	0~10	0~10	0~10	0~20	0~ 5	0~5
	DUCS-2Y	387~404	0~ 10	0~10	0~10	0~10	0~10	0~20	0~ 5	0~5
	DUCS-2	360~410	0~ 10	0~10	0~10	0~10	0~10	0~20	0~ 5	0~5
	DUCS-3	360~∞	0~ 15	0~20	0~20	0~10	0~10	0~20	0~ 5	0~5
	DUCS-H2	360~∞	0~ 30	0~ 7	0~30	0~25	0~ 5	0~25	0~ 5	0~7
	DUCS-N	360~∞	15~ 70	0~20	0~25	0~15	0~10	0~30		
	DUCS-H	360~∞	15~ 70	0~20	0~25	0~20	0~10	0~30		
	DUCS-HS	360~∞	71~130	0~20	0~25	0~20	0~10	0~30		
	DUCS-HEX	360~∞	5~ 20	0~10	0~25	0~20	0~10	0~25		

形状
Shapes



鋳物用銑鉄の有用性
Advantages Derived from Using Foundry Pig Iron

1	<p>製品品質の安定へ寄与</p> <p>銑鉄鋳物の組成に近く、化学成分ばらつきの少ない鋳物用銑鉄をベースの配合材料として用いることにより、溶湯性状が安定し製品品質の安定に寄与します。</p> <p>Contribution toward stabilized quality of castings</p> <p>The use of foundry pig iron, with a composition similar to that of castings and reduced deviation in composition, as the basic blending material, contributes to the stable performance of hot metal and stable quality castings.</p>
2	<p>鋳鉄として好ましい黒鉛組織のための炭素供給源</p> <p>銑鉄の特性は黒鉛組織に支配されており、十分に伸びたフレッシュな黒鉛をもつ鋳物用銑鉄は良好な黒鉛組織の銑鉄鋳物を生み出します。</p> <p>Source of carbon for appropriate graphite structures needed in cast iron</p> <p>The characteristic performance of cast iron is determined by the graphite structure. Foundry pig iron, which has fully-developed and fresh graphite, allows production of cast iron products with favorable graphite structures.</p>
3	<p>黒鉛化の促進による鋳造性の改善</p> <p>鋳物用銑鉄を配合することにより、凝固時の黒鉛化が促進されて凝固収縮量が減少し、その結果として引け防止等の効果により鋳造歩留が改善します。</p> <p>Improved castability through better graphitization</p> <p>Graphitization during solidification is promoted and solidification shrinkage is reduced by the blending of foundry pig iron, and as a result of the effect of preventing shrinkage, casting yield is improved.</p>
4	<p>鋳鉄材質の均一化と機械的性質の改善</p> <p>鋳鉄材の品質を示すための指標として用いられる成熟度は、良質の鋳物用銑鉄を配合することにより向上します。これは鋳物用銑鉄に含まれる黒鉛によってセル組織が適正化され、鋳鉄中のキッシュ黒鉛が共晶セルの核になるからと報告されています。</p> <p>Uniform quality and improved mechanical properties of cast iron</p> <p>The reife grad, used as a parameter to indicate the quality of cast iron products, is improved by blending of high-quality foundry pig iron. It is reported that this is because the cell structure is optimized by the graphite contained in the foundry pig iron, and the kish graphite contained in cast iron becomes the nucleus of eutectic cells.</p>
5	<p>黒鉛接種としての効果</p> <p>鋳物用銑鉄は鉄源であると同時にカーボンの供給源です。黒鉛接種材としての鋳物用銑鉄の効果は、直接的には黒鉛化促進によるチルの防止、間接的には良好な黒鉛組織が得られることによる機械加工性向上です。</p> <p>Effect of graphite inoculation</p> <p>Foundry pig iron serves as not only the source of iron but also the source of carbon. The direct effects of using foundry pig iron as the graphite inoculation agent is the prevention of chill due to the promotion of graphitization, and the indirect effect, the improvement in machinability due to the resulting favorable graphite structure.</p>
6	<p>溶解時間の短縮による生産性の向上</p> <p>鋳物用銑鉄は鋼屑に比べて低融点であるため、電気炉内での溶け落ちが早まり溶解電力量を低減でき、より低温で安定した組成の溶湯が得られます。</p> <p>Improved productivity due reduced melting time</p> <p>Because the melting point of foundry pig iron is lower than that of steel scrap, the melting-down of foundry pig iron within electric furnaces is quicker, and thus both the use of electricity in melting can be reduced, and the production of stable composition hot metal at a lower temperature can be achieved.</p>

日本製鉄 鋳物用銑鉄の使用メリット
Application Advantages of Nippon Steel's Foundry Pig Iron

<p>純度が高い (P, Ti, Cr, V, Zn) 濃度が低い</p> <p>High purity (Low concentrations of P, Ti, Cr, V and Zn)</p>	<p>・不純物元素の希釈 ・Dilution of the concentration of impurities</p> <p>・黒鉛化促進／黒鉛球状化促進 ・Promotion of graphitization / Promotion of graphite spheroidizing</p>	<p>・鋼屑中の有害元素、増加への対応可能 ・Possibility to cope with the trend toward increasing harmful elements in steel scrap</p> <p>・不良率低減 ・歩留向上 ・副資材低減 ・安定生産 ・生産性改善 ・エネルギーコスト低減</p>
<p>成分変動が少ない Less deviation in composition</p>	<p>・溶湯成分の安定 ・Stable composition of hot metal</p>	<p>・Reduced fraction defects ・Improved yield ・Reduced use of auxiliary materials ・Stable production ・Improved productivity Reduced energy cost</p>
<p>形状がコンパクト Compact shape</p>	<p>・高嵩密度 ・高充填密度(溶解電力低減／溶解時間短縮) ・置場効率向上 ・ホッパー切り出しトラブル減</p> <p>・High bulk density ・High packaging density Reduced use of electricity in melting Shortened melting time ・Improved operational efficiency of stock yards ・Reduced troubles in hopper</p>	<p>● 生産性向上 ● 品質の安定 ● コスト低減</p> <p>● Improved productivity ● Stable quality ● Reduced cost</p>
<p>錆が少ない [防錆(錆遅延)処理] Lower occurrence of rusting (Rust-prevention (delayed-rusting) treatment)</p>	<p>・錆発生量減少 ・Reduced rusting</p>	<p>・作業性改善 ・Improved working efficiency</p>
	<p>・スラグ発生量減少 ・Reduced generation of slag</p> <p>・粉塵発生量減少 ・Reduced generation of dust</p>	<p>・スラグ処理減、炉材損耗量減 etc ・Reduced treatment of slag Reduced loss of refractory material</p> <p>・環境改善 ・Improved environment</p>