

## The Use of Hot Briquetted Iron (HBI) in the Basic Oxygen Furnace (BOF) for Steelmaking

The use of HBI as a part of the solid charge mix is recommended for the following situations:

- When the proportion of hot metal and scrap used results in overheating at the end of the blowing process (using HBI as a coolant produces the desired temperature without a cooling process)
- When iron ore is used as cooling agent due to scarcity of scrap (which reduces productivity)
- When scrap availability is an issue
- When lower sulphur content of the charge material is required
- When lower residual content is required



### The Benefits of HBI in the BOF

HBI provides an optimal BOF charge due to

- Low levels of residual elements
- Bulk density of  $\sim 2.8 \text{ t/m}^3$  - higher than scrap
- Same metallic yield as hot metal
- More predictable mass and heat balances

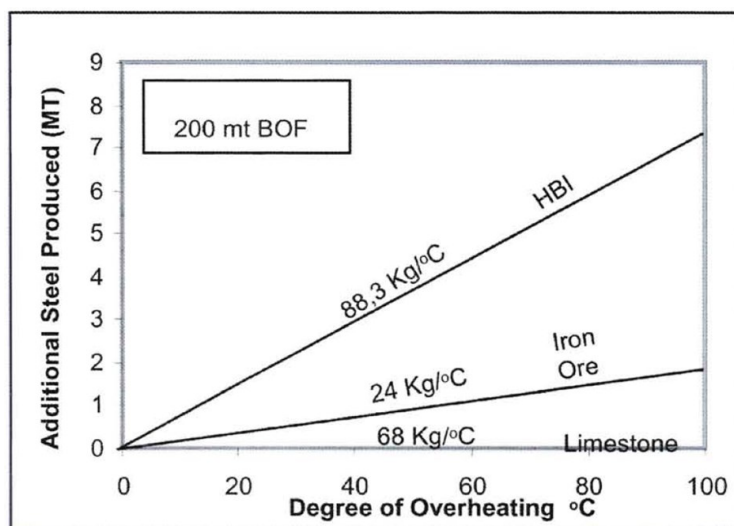
HBI is an excellent trim coolant due to the following characteristics

- Free-flowing from overhead bins
- Well defined physical and chemical properties
- Maintains steel bath composition
- Easily charged from overhead bins
- Rapid penetration of slag
- Reduces slag volume when used instead of fluxes
- Higher yield and increased productivity than with conventional coolants



<b>General Specifications for HBI (Ranges % by weight)</b>	
(based on 65.5 - 68.0% Fe Iron Ore)	
<b>Metallization</b>	94.0%
<b>Fe (Total)</b>	88.3 - 94.0%
<b>Fe (Metallic)</b>	83.0 - 88.4%
<b>C</b>	0.5 - 1.6%
<b>S</b>	0.001 - 0.03%
<b>P<sub>2</sub>O<sub>5</sub></b>	0.005 - 0.09%
<b>Gangue*</b>	3.9 - 8.6%
<b>Mn, Cu, Ni, Cr, Mo, Sn, Pb, Zn, V</b>	Traces
<b>Size (typical)</b>	(90 - 140) x (48 - 58) x (32 - 34) mm
<b>Fines and chips</b>	≤ 5.0%
<b>Apparent Density</b>	> 5 t/m <sup>3</sup>
<b>Bulk Density</b>	2.5 - 3.3 t/m <sup>3</sup>
* residual unreduced oxides, mainly SiO <sub>2</sub> and Al <sub>2</sub> O <sub>3</sub> , but also CaO, MgO, MnO, etc.	

## Results of Charging HBI as Part of the Solid Charge



### Cooling intensity relative to scrap

scrap	1.0
iron ore	2.0 - 3.0
limestone	3.0 - 4.0
HBI	1.2

### Additional Crude Steel Production based on various Coolants

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