

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 scrap availability is an issue
- 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 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 2800 kg/m³ is higher than any type of scrap
- 📦 **HBI charging options** with scrap chute (preferred) and overhead bins
- ⚗️ Same **metallic yield** as hot metal
- ⚖️ More **predictable** mass and heat balances
- 🌿 **HBI reduces CO₂ emissions** as it replaces the similar amount of hot metal (same hot metal yield)

HBI is an excellent trim coolant due to the following characteristics:

- Non-reactive and compact, making it safer to store and transport than DRI
- 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



Basic Oxygen Furnace

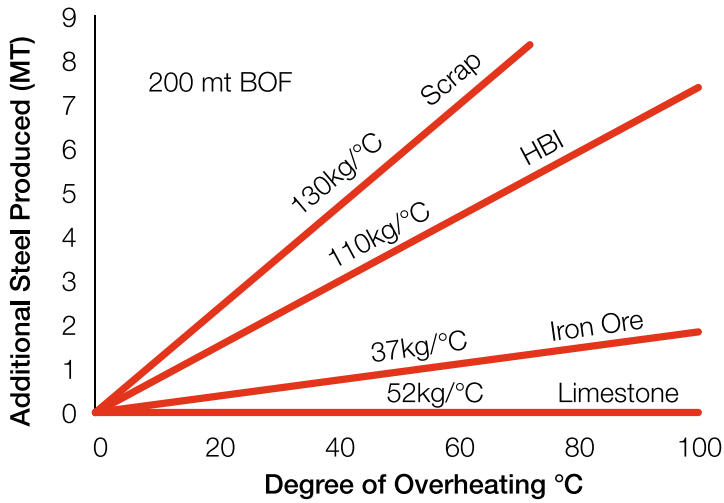


Hot Briquetted Iron (HBI)



Results of Charging HBI as Part of the Solid Charge

Additional Crude Steel Production Based on Various Coolants



Compared to Conventional Coolants

- Yield improvements
- Increased productivity
- BOF charge mix HBI ratios shall be <100 kg per ton of liquid steel to allow efficient operation (no local temperature drops and sticking)

Coolant agent	Cooling intensity relative to scrap*
Scrap	1.0
HBI / DRI	1.2
Limestone	2.0 – 3.0
Iron ore	3.0 – 4.0

*typical values, depending on Fe and gangue content