What are Ore Based Metallics (OBM's)?

- Direct Reduced Iron (DRI), Hot Briquetted Iron (HBI) and Pig Iron are Ore Based Metallics (OBM's), manufactured from iron ore or titanium-bearing mineral sands (High Purity Pig Iron HPPI, also known as Nodular or Spheroidal Graphite Pig Iron, is produced from smelting of ilmenite)
- OBM's are best used as scrap supplements to dilute impurities in ferrous scrap in EAF steelmaking and iron casting
- OBM's can be used as productivity enhancers in blast furnace (BF) or as trim coolant in the basic oxygen furnace (BOF) steelmaking

Direct Reduced Iron

Hot Briquetted Iron

Pig Iron

Typical Benefits of OBMs in Steelmaking, Ironmaking and Iron Foundries

- **Consistent quality and low residual content**, e.g. copper, allows dilution of impurities in scrap
- **Controlled carbon content**, consistent carbon recovery
- **Predictable** mass and heat balances
- Can be **continuously charged** to the furnace (DRI and HBI)
- **High density** can reduce the number of bucket charges, allows for increased use of lower cost, less dense feedstock and reduces storage space requirements
- Better **slag foaming**
- Easier on **hearth refractory & electrodes**
- **Higher value-in-use** for many steel products in comparison to scrap
- **Increased flexibility** is feedstock supply

General Specifications for DRI and HBI (Ranges % by Weight) (based on 65.5 - 68.0% Fe Iron Ore)		
	DRI	**HBI**
Metallization	94.0%	94.0%
Fe (Total)	86.1 - 93.5%	88.3 - 94.0%
Fe (Metallic)	81.0 - 87.9%	83.0 - 88.4%
C	1.0 - 4.0%	0.5 - 1.6%
S	0.001 - 0.03%	0.001 - 0.03%
P_2O_5	0.005 - 0.09%	0.005 - 0.09%
Gangue*	3.9 - 8.4%	3.9 - 8.6%
Mn, Cu, Ni, Cr, Mo, Sn, Pb, Zn, V	Traces	Traces
Size (approx.)	4 - 20 mm	(90 -140) x (48 - 58) x (32 - 34) mm
Apparent Density	3.4 - 3.6 t/m^3	> 5.0 t/m^3
Bulk Density	1.6 - 1.9 t/m^3	2.5 - 3.3 t/m^3
* residual unreduced oxides, mainly SiO_2 and $Al_2O_{3,}$, but also CaO, MgO, MnO, etc.		

General Specifications for Pig Iron (ranges % by wt.)			
	Basic	**Foundry**	**HPPI / Nodular**
Fe	94.0 -95.0%	94.0 - 95.0%	94.0 - 95.0%
C	3.5 - 4.5%	3.5 - 4.5%	3.5 - 4.5%
Si	≤ 1.25%	1.5 - 3.5%	0.05 - 2.0%
Mn	≤ 1.0%	0.5 - 1.0%	≤ 0.05%
S	≤ 0.05%	≤ 0.05%	≤ 0.01%
P	≤ 0.15%	≤ 0.12%	< 0.02%
Ingot Weight	3.5 - 45 kg	3.5 - 45 kg	3.5 - 45 kg
Bulk Density	3.3 - 3.7 t/m^3	3.3 - 3.7 t/m^3	3.3 - 3.7 t/m^3