



Ghaniya Salmeen Al-Hamdani Trading Company has been working in the field of exporting raw materials needed for steel manufacturing since 2010 to Arab countries and China.

For producing different types of Steel Products, variety of materials are required. Key raw materials needed in steelmaking include iron ore, coal, limestone and recycled steel.



Direct Reduced Iron (DRI)



Hot Briquetted Iron (HBI)



Iron Ore Pellet



Ferro Silicon



COKE - CARBON

DIRECT REDUCED IRON (DRI)

Benefits of Charging DRI in Steelmaking Furnace

- Low residual element
- Predictable and uniform chemical analysis
- Carbon content can be customized
- Easier to handle than scrap
- Can be continuously fed to the furnace
- Better slag foaming
- Control of nitrogen in steel
- Melt consistency



General Specifications for DRI (Ranges % by Weight)

STORAGE, HANDLING AND LOADING OF DRI

1- Storage prior to loading

1.1 Screening

After production, the DRI will be screened prior to storage in order to reduce the amount of fines.

1.3 Passivation-technique

Passivation technique can either be active Passivation or passive Passivation;

General Specifications for DRI (Ranges % by Weight)

Row	ITEM	PCT (%)
1		87
2		80
3		1.2
4		0.005
5		0.005
6		1
7		1.1
8		1.1
9		4.8

A) Active Passivation (or Air-passivation)

In order to have the produced DRI intended for export to conform to the IMO-regulations, it will be treated with an air-passivation method by ASE STEEL Group. The air-passivation method will consist of a mix of approx. 78% Nitrogen (N), approx. 20% Carbon dioxide (CO₂) and approx. 2% Oxygen (O) submitted to the DRI during silo storage.

B) Passive Passivation

After screening, the DRI will be stored at the open storage-area in two stages in order to have the material naturally passivated by ASE STEEL Group.

1st stage will consist of separate heaps consisting of one truck-load at abt. 1 metre height, preferred duration at min 2-3 days.

2nd stage will consist of the separate heaps being collected and stored together at max. 2 metres height, preferred duration at min 2-3 days.

During both these periods of time the DRI can rest and reach a constant temperature.

Constant factor of

importance is to leave the DRI untouched as much as possible. When the DRI needs to be transported/handled/loaded, this must be done in the quickest and most effective manner, where after the DRI can rest again.

1.4 Temperature checks / recording

The DRI storage should be stored at a maximum height of 2 metres, whereas the temperature of the stored DRI is to be monitored daily by ASE STEEL Group by means of thermocouples placed inside the DRI at different/various locations.

(position on floor and at 0,5 metres height, length intervals of about 15 Metres). A record must be kept for reference of the daily temperature checks. Loading is not permitted if the DRI temperature exceeds 65°C.

Overview of temperature records in combination with general Conformity certificate stating that the materials are within the specification must be presented by producers/suppliers to the master of subject vessel.

1.5 Moisture determination

As part of the IMO-regulation effective as from Jan. 2010, moisture content of the material designated for

shipment must be less than 0.3% and must be monitored during loading.

2- Transportation to vessel – conveyer – belt to Soft-loaded

From the open storage area, by means of pay loader, DRI will be loaded onto trucks.

Trucks will transport

materials to the port, whereas it will be stored onto clean and dry surface. In port,

materials should not be

stored higher than 3 metres.

3- Shipping vessel – vessel loading requirements – vessels preparation before/during/after loading

3.1 Shipping Vessel

The preferred vessels have McGregor-type hatch covers and is suitable to carry DRI incl. B-class certificate with the average shipping volume per vessel is around 30,000 to 40,000 metric tons.

A “competent authority” is appointed by the government of country of loading to certify that the vessel is safe for carriage and that the DRI to be shipped is stable as required by the IMO regulations.

3.2 Vessel loading requirements

On arrival, prior to loading-operations, the vessel is inspected by the “competent authority”, Supercargo and loading supervisor to verify :

- All holds must be clean and dry, incl. bilge wells
- Electrical fans/blowers and cargo lights are disconnected
- The Bilge line in the engine room is blanked off.
- All hatches are tested for water tightness (by means of Ultrasonic Hatch cover test or hose-test) to ensure that there are no leaks from hatch covers or openings

After completion of the test, a certificate of fitness is issued by ASE STEEL Group and the guidelines for safe shipping and emergency procedures are given to Master of the vessel. This in combination with a Conformity certificate as to be issued by competent authority that cargo is in accordance to the IMO regulations.

3.3 Vessels preparation before/during/after loading

Before loading the DRI B, the floor of each hold is wired with thermo couples at specific locations for monitoring during the voyage. (TC1, TC2, TC3, TC4 and TC5) When 50 – 100 % of the cargo has been loaded a second layer of thermo couples is placed in each hold by ASE STEEL Group. (TC6, TC7, TC8, TC9) Steel-pipes with holes are installed/placed on the floor of each hold for Nitrogen purging of the cargo after loading. (min. 50 mm diameter, with 10 mm holes placed 150 mm apart) At the end of loading, two gas sampling lines are installed, one for Oxygen (O₂) and the other for Hydrogen (H₂) monitoring. O₂-sampling line is installed just over the cargo, and the H₂-sampling line is installed just below the hatch cover. The hatches of all holds are sealed with Marine/ramnek tape on openings and seams, ventilators are shut tight and covered. In addition to the Marine/ramnek tape, the usage of Polypropylene foam is recommended to secure and seal the holds. Nitrogen (N₂) is pumped through the steel pipes on each hold to displace air and create an inert atmosphere. After completion of inerting the hold, the Nitrogen (N₂) supply line is disconnected and the inlet to the hold is sealed. Oxygen (O₂) level is approx. 2-3% at this time. During voyage a separate ISO-tank with Nitrogen plus a vaporizer must be placed on board by ASE STEEL Group in order to maintain lower oxygen levels during voyage by means of topping up certain holds in case necessary. The supercargo accompanies all voyages of DRI to ensure safe carriage and cargo stability at sea. Duties are to monitor/record/report the cargo for Temperature, Oxygen (O₂) and Hydrogen (H₂).

Container Shipment

DRI could be shipped in 20ft container. ASE STEEL will supply DRI in 1 Ton Jumbo Bag in order to stuffing and loading in container as an option for small quantity purchase order and short distance voyages in good and safe environmental conditions. Contact ASE STEEL for quotation price and extra charge for big bag packing of Direct Reduced Iron (DRI – Sponge Iron).



HOT BRIQUETTED IRON (HBI)

Hot Briquetted Iron (HBI) is a premium form of DRI that has been compacted at a temperature greater than 650°C at time of compaction and has a density greater than 5,000 kilograms per cubic meter (5,000 kg/m^3).

HBI was developed as a product in order to overcome the problems associated with shipping and handling of DRI – due to the process of compaction it is very much less porous and therefore very much less reactive than DRI and does not suffer from the risk of self-heating associated with DRI.

The principle market for HBI is electric arc furnace (EAF)



steelmaking, but HBI also finds application as a trim coolant in basic oxygen furnace (BOF) steelmaking and as blast furnace feedstock.

Row	ITEM	PCT By Weight (%)	Range
1	Metallization (MD)	91	Min
2	Fe Total	88	Min
3	Fe Metallic	80	Min
4	Carbon	1	Min
5	Sulphur	0.03	Max
6	Phosphorous	0.08	Max
7	SiO ₂ +CaO+Al ₂ O ₃ +MgO	7.5	Max

HBI Specification

Benefits of Charging HBI in the Steelmaking Furnace

Low residual element content enables production of high quality steel products or use of higher percentage of lower cost scrap in the charge mix
 Known and consistent chemistry, certified by analysis, assists melt consistency

Consistent shape and form enable efficient material handling and storage

High density can reduce the number of bucket charges, allows for increased use of lower cost, less dense feedstock and reduces storage space requirements

Can be continuously charged to the furnace

Acts as N scavenger = low N content in steel

Shipping and Handling

HBI – Direct Reduced Iron (A) – is classified as Group B (cargo with chemical hazard) and class MHB (material hazardous only in bulk) under the International Maritime Organization’s International Maritime Solid Bulk Cargoes Code, but, unlike DRI which requires shipment under an inert atmosphere, HBI requires only surface ventilation during shipment.

IRON ORE PELLELET



The essential raw material for the manufacture of steel is found in nature in the form of rocks, mixed with other elements. Through various industrial processes with high technology, iron ore is processed and then sold to the steel industry.

List of most popular tests performed:

- Tumble Strength (ISO 3271)
- Crushing Strength (ISO 4700)
- Swelling Index (ISO 4698)
- Size range
- Reducibility (ISO 4695)
- Relative Reducibility (ISO 7215)
- Reduction Disintegration (ISO 4695)
- Reduction Disintegration and metallization for DR feedstock (ISO 11257)

No	Items	Criteria
1	Fe (Total)	65+-0.2%
2	Sulphur (S)	0.008% Max
3	Phosphorus (P)	0.05% Max
4	Al ₂ O ₃	1% Max
5	SiO ₂	4% Max
6	MgO	1.7% Max
7	CaO	0.7% Max
8	Tumbler Index (+6.3mm)	95% Min
9	Abrasion Index (-0.5mm)	3.5% Max
10	Cold Compression Strength (CCS)	250-300Kg
11	Size (6.3-19mm)	95% Min

FERRO SILICON

Ferro Silicon Standard: ISO 5445



Ferro Silicon (FeSi)

Grade	Si	Al	P	S	C	Mn	Cr	Ti	Fe
FeSi 75 Al 2	72-80	1.5-2	<0.05	<0.04	<0.2	<0.5	<0.3	<0.3	BAL

Ferro Silicon Standard: ISO 5445

Size:

- 0-3 mm
- 3-10 mm
- 10-60 mm

Application:

- Deoxygenating in steel production
- Reducer in the production of other Ferro-alloys
- Alloy element in producing steel & cast iron

COKE – CARBON

Calcined Petroleum Coke
(CPC) for EAF Steelmaking
Carburizing

Chemical Analysis

C (%)	S (%)	Ash (%)	V.M (%)	Real Density (gr/cc min)
98 Min	0.6 Max	0.5 Max	0.5 Max	2.05

Size

- 1-3mm
- 1-5mm

Packing

- 25 kg Paper Bag
- 1000Kg Big Bag

Note:

Other sizes and specification as per customer's order could be produced



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