

Sponge Iron Industry

An overview of problems & solutions

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Sponge Iron Industry has witnessed remarkable growth in the last few years in India. India which was ranked 3rd in the world in 2001, is the largest producer of sponge iron today. When the growth is beyond expectations, it will be followed by the problems as usual. Now, it is the time to emphasize on the problems but not on the progress.

The problems faced by the Sponge Iron manufacturers are mainly :

1. Sponge iron fines generated during process (25% to 40%) affecting the profit margins mostly in south due to soft iron ore available in Bellary and Hospet Area.
2. Low metallization of DRI due to poor quality of Iron ore available in the market which is affecting the yield in liquid steel production.
3. High volumes of ash and coal char generated everyday, becoming a threat for environmental protection which can be controlled by Installing Power Plant and Fly ash brick units.
4. High volumes of iron ore fines, coal fines generated in the plant raw material handling system occupying space for which separate area should be identified and stored.
5. Due to poor quality of iron ore and high ash content coal, resulting in short campaign life, which is going to affect the commercial viability.
6. High fluctuations in the finished product price, recently it had come down to even less than Rs.8000/ton.
7. The coal-based Sponge Iron produced can not be exported due to the highly flammable nature, when the supply of DRI is more than demand.

The DRI route requires iron ore and coal in nascent form with least

beneficiation. Iron ore is available in lump form with required sizes also, but availability of coal is the biggest constraint. Many units are depending on Imported coal which is very expensive.

Definition and Uses of Pellets

Iron ore pellet is a kind of agglomerated fines which has better tumbling index as compared to that of parent ore and can be used as a substitute for the same. Iron ore pellets are being used for long in blast furnaces in many countries where lump iron ore is not available.

In India, the necessity of pelletization is realized because of several reasons and advantages. Sponge iron Industry which can be benefited more has started looking for use of iron ore pellets. In Essar and Jindal Steel is made through DRI route, and this DRI is made by using Pellets for many years.

Necessity of Pelletization:

India has adequate reserves of iron ore. But the country has inadequate infrastructure for catering to the Iron ore demands of all the DRI/steel plants in the country. The excessive fines generated from the iron ore crushing units are mostly going waste.

To curb the shortage of iron ore and meet the ever increasing demand for steel i.e. 100 Million tones by 2020 as indicated by industry experts and steel Ministry, Pelletization Technology is the only route that is going to dominate the Indian DRI route of steel industry.

The steep rise in the prices of iron ore, in range of Rs. 2000 to 3000 per ton due to the up coming of large number

of Sponge Iron plants has necessitated going for Pelletization Technology. This gap is proposed to be filled up by the utilization of the iron ore fines below 5 mm which do not find the market and are being sold at a meager price of Rs. 550 to 900 per ton. This has led to cost effective utilization of iron ore fines to produce pellets to be used for sponge iron production and steel production through blast furnace route. In addition to this, there is also a large export market for pellets to China, Korea, Japan etc.

Advantages of using iron ore pellets instead of lumps

1. The rotary kiln can produce 25% more without any changes in the design
2. Specific consumption of coal will come down by 10%
3. Campaign life will increase to almost 60%
4. As there will be no accretion and no fused lump formation, the refractory repairing cost will be reduced by 50%
5. Metallisation will be better compared to lump ore
6. There will be hardly 5% of fines in the finished product against 35 to 40%, when produced with lump ore.
7. Maintenance and electricity cost will come down by 50%, as there will be no need for crushing and screening of iron ore lumps.
8. There are no losses of handling iron ore, as pellets will not break during transport or handling.
9. Finally, we will have better environment to work.

EICS Technology Pvt. Ltd. developed a technology to produce iron ore pellets from both hematite and magnetite ores available in India. This technology will support for smaller capacities by using 90% Indian made equipment. The cost of producing these pellets will be very competitive. □□□