

Sponge Iron Standards

**MINISTRY OF ENVIRONMENT AND FORESTS
NOTIFICATION
New Delhi, the 30th May, 2008**

G.S.R.414(E) - In exercise of the powers conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following Rules further to amend the Environment (Protection) Rules, 1986, namely:-

1. (1) These rules may be called the Environment (Protection) Fourth Amendment Rules, 2008.
(2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Environment (Protection) Rules, 1986, –
 - (i) in Schedule I, after serial number 98 and the entries relating thereto, the following serial number and entries shall be inserted namely:-

Sl. No.	Industry	Parameter	Standard
1	2	3	4

99 Sponge Iron Plant
(Rotary Kiln)

A. Emission Standards*

Parameter	Fuel Type	Limiting value for Concentration
Particulate matter	Coal	100 mg/Nm ³
	Gas	50 mg/Nm ³
Carbon Monoxide (Vol/Vol.)	Coal /gas	1%
Stack Height** (minimum)	coal/gas	30.0 m

Note:-

- * Emission shall be normalized at 12% CO₂ in stack emission.
** Stack height shall be calculated as $H = 14.0 Q^{0.3}$ where Q is emission of Sulphur Dioxide (SO₂) in kg/hr i.e.

SO ₂ (kg/hr)	Height (metre)
Upto 12.68	30
12.69-33.08	40
33.09-69.06	50
69.07-127.80	60
127.81-213.63	70

(De-dusting unit)

Particulate matter (mg/m³)	Existing unit 100	New unit 50
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Note:-

- (i) Stack attached to de-dusting unit shall have minimum height of 30.0 metre.
- (ii) If, De-dusting unit is connected to After Burner Chamber (ABC), emission shall be emitted through common stack (minimum height 30.0 metre) having separate arrangements for emission monitoring for de-dusting unit.

(Rotary Kiln / De-dusting unit)

B. Fugitive Emission Standards

Particulate matter (µg/m³)	Existing unit 3000	New unit 2000
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Note:-

- (i) The existing industry shall comply with a standard of 2000 (µg/m³) after one year the date of notification.
- (ii) Fugitive emission shall be monitored at a distance 10.0 metre from the source of fugitive emission as per following:

Area	Monitoring location
Raw material handling area	Wagon tippler, Screen area, Transfer points, Stock bin area
Crusher area	Crushing plant, vibrating screen, transfer points
Raw material feed area	Feeder area, Mixing area, Transfer points
Cooler discharge area	Over size discharge area, Transfer points, Product processing area Intermediate stock bin area, Screening plant, Magnetic separation unit Transfer points, Over size discharge area, Product separation area, Bagging area
Other areas	As specified by State Pollution Control Board / Pollution Control Committee

C. Effluent Standards

pH	5.5-9.0
Total suspended solids	100 mg/l
Oil & grease	10 mg/l
Chemical oxygen demand	250 mg/l

Guidelines / Code of Practice for Pollution Prevention for Sponge Iron Plants

1. Air Pollution

1.1 Stack Emission from Kiln

- (i) Suitable Air Pollution Control System shall be installed to achieve the prescribed stack emission standards. The following air pollution control system/combination of system are most commonly used in such type of industry:
 - Electrostatic Precipitator (ESP)
 - Bag Filter
 - Wet Scrubber
 - Cyclone / Multiclone
- (ii) All Pollution control equipment may be provided with separate electricity meter and totaliser for continuous recording of power consumption. The amperage of the ID fan may also be recorded continuously. Non-functioning of Pollution control equipment should be recorded in the same logbook along with reasons for not running the Pollution Control Equipment.
- (iii) The safety cap/emergency stack of rotary kiln type plant, which is generally installed above the After Burner Chamber (ABC) of feed end column should not be used for discharging untreated emission, bypassing the air pollution control device.
- (iv) In order to prevent bypassing of emissions through safety cap and non-operation of pollution control device, software controlled interlocking facility should be provided on the basis of real time data from the plant control system, to ensure stoppage of feed conveyor, so that, feed to the kiln would stop automatically, if safety cap of the rotary kiln is opened or Air Pollution Control System is not in operation. The system should be able to take care of multiple operating parameters and their inter relations to prevent any possibility of defeating the basic objective of the interlock. The system should be foolproof to prevent any kind of tempering. The software based interlocking system, proposed to be installed by industry should be get approved by the concerned State Pollution Control Board, for its adequacy, before installation by the industry.
- (v) Mechanical operated system for timely collection and removal of the flue dust generated in air pollution control device shall be installed.

1.2 Stack Emission from de-dusting units

All de-dusting units should be connected to a stack having a minimum stack height of 30 m. However, in specific cases stack height can be reduced as specified in the notified standards. Sampling porthole and platform etc. shall be provided as per CPCB emission regulation to facilitate stack monitoring. De-dusting units can also be connected to ABC Chamber and finally emitted through common stack with kiln off-gas emissions.

1.3 Fugitive Emission

The measurement may be done, preferably on 8-hour basis with high volume sampler. However, depending upon the prevalent conditions at the site, the period of measurement can be reduced.

2. Effluent Discharge

- (i) All efforts should be made to reuse and re-circulate the water and to maintain zero effluent discharge.
- (ii) Storm water / garland drain should be provided in the plant.

3. Noise Control

The industry should take measures to control the Noise Pollution so that the noise level standards already notified for Industrial area are complied.

4. Solid Waste Management

Char

Char should be mixed with coal or coal washery rejects and used as fuel for generation of power. It is techno-economic viable option for plants having capacity 200 TPD and above. Also the smaller capacity individual Sponge Iron Plants (Capacity upto 100 TPD) and operating in cluster can collectively install common unit for power generation. The Sponge Iron Plant are free to explore other options / possibilities to use char for generation of power. Char can be sold to local entrepreneurs for making coal briquettes. It can also be mixed with coal fines, converted to briquettes and used in brick kilns. The industry can explore other reuse / recycling techniques for Char.

Under no circumstances char should be disposed off in agricultural fields/other areas. Logbook for daily record, of Char production and usage must be maintained by the industry and the record shall be made available to officials of CPCB/SPCB/PCC during inspection.

Kiln Accretions

The kiln accretions are heavy solid lumps and can be used as sub- base material for road construction or landfill, after ascertaining the composition for its suitability and ensuring that it should not have any adverse environmental impact. The industry can explore other reuse / recycling techniques for Kiln Accretions.

Gas Cleaning Plant (GCP)/Scrubber Sludge

The sludge should be compacted and suitably disposed off after ascertaining the composition for its suitability and ensuring that it should not have any adverse environmental impact. The industry can explore other reuse / recycling techniques for Gas Cleaning Plant (GCP)/Scrubber Sludge

Flue Dust

Flue dust is generated from air pollution control system installed with kiln. Secondary flue dust is also generated from air pollution control equipment installed with Raw Material Handling, Coal Crusher, Cooler Discharge and Product house unit. The reuse/ recycling of the flue dust generated / collected may be explored and suitably implemented.

Fly ash

Fly ash is generated from Char / Coal based Captive Power Plant, if any. Fly ash brick making plant may be install for fly ash utilization. Fly ash can be utilized in cement making by Cement industry also. The industry can explore other reuse / recycling techniques for Flue Dust / Fly ash.

Bottom Ash

Bottom ash is generated from Char / Coal based Captive Power Plant, if any. Bottom ash may have objectionable metallic compounds, therefore should be stored in properly designed landfills as per CPCB guidelines to prevent leaching to the sub-soil and underground aquifer.

General

- (a) Solid waste management program should be prepared with thrust on reuse and recycling. Solid waste disposal site should be earmarked within the plant premises. The storage site of solid waste should be scientifically designed keeping in view that the storage of solid waste should not have any adverse impact on the air quality or water regime, in any way.
- (b) The various types of solid wastes generated should be stored separately as per CPCB guidelines so that it should not adversely affect the air quality,

becoming air borne by wind or water regime during rainy season by flowing along with the storm water.

5. Raw Material handling and Preparation

- (a) Unloading of coal by trucks or wagons should be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading.
- (b) Crushing and screening operation should be carried out in enclosed area. Centralized de-dusting facility (collection hood and suction arrangements followed by suitable de-dusting units such as bag filter or ESP or equally effective method or wet scrubber or any other de-dusting unit and finally discharge of emission through a stack) should be provided to control Fugitive Particulate Matter Emissions. The stack should conform to the emission standards notified for de-dusting units. Water sprinkling arrangement should be provided at raw material heaps and on land around the crushing and screening units.
- (c) Work area including the roads surrounding the plant shall be asphalted or concreted.
- (d) Enclosure should be provided for belt conveyors and transfer points of belt conveyors.

The above enclosures shall be rigid and permanent (and not of flexible/cloth type enclosures) and fitted with self-closing doors and close fitting entrances and exits, where conveyors pass through the enclosures. Flexible covers shall be installed at entry and exit of the conveyor to the enclosures, minimizing the gaps around the conveyors.

In the wet system, water sprays/ sprinklers shall be provided at the following strategic locations for dust suppression during raw material transfer:

- Belt conveyor discharge/ transfer point
- Crusher/screen discharge locations

6. Waste Heat Recovery Boiler (WHRB)

Sponge Iron Plants of capacity more than 100 TPD kilns may use Waste Heat Recovery Boiler (WHRB) for generation of power. Installation of Waste Heat Recovery Boiler (WHRB) may qualify the industry for CDM benefits.

7. Cooler Discharge and Product Separation Unit

Permanent and rigid enclosures shall be provided for belt conveyors and transfer points of belt conveyors. Dust extraction cum control system to arrest product loss in cooler discharge and product separation area may be installed.

8. Char based Power Plant

For plant having capacity of 200 TPD of cumulative kiln capacity, the power generation using char as a part of fuel, is a viable option. Power generation using char as a part of fuel may be implemented in a phased manner targeting for 100% utilization of char.

Individual Sponge Iron Plants of capacity upto 100 TPD and located in cluster can install a common char based power plant collectively.

9. New Sponge Iron Plants

- (i) No New Sponge Iron Plant will be commissioned without installation of Pollution control systems to achieve the stipulated Standards. The concerned State Pollution Control Board will accord consent to operate only after physical verification of the adequacy of the installed pollution control systems for meeting the standards and stipulated conditions in the consent to establish.
- (ii) All new kilns shall have independent stack with the kiln or multi-flue stacks in case two or more kilns are joining the same stack for better dispersion of pollutants.
- (iii) Any entrepreneur having more than 2x100 TPD kiln may install WHRB for power generation, as it's a technically viable option, which also qualify the industry for CDM benefits.

For plants having capacity of 200 TPD or more, power generation using char as part of fuel in boiler is techno-economic viable option, therefore, new plants may install power generation unit at the time of installation of the industry.

10. General Guidelines

- (a) Extensive plantation/Green belt shall be developed along the roads and boundary line of the industry. A minimum 15 m width Green Belt along the boundary shall be maintained. However, the green belt may be

designed scientifically depending upon the requirement and local and mix species of plants may be selected for the green belt.

- (b) Monitoring of stack emissions, fugitive emissions, trade effluent and noise level shall be done as per CPCB regulations. On line stack monitoring facilities shall be provided and operated continuously to ensure compliance to stack emission standards. Calibration of the system to be carried out by a third party accredited laboratory. List of the accredited laboratory may be obtained from CPCB/SPCB.
- (c) Pollution control systems shall be operated as an integral part of production to ensure minimum emissions. Pollution Control System shall start before conveyor operation/operation of plant. Similarly pollution control system shall be stopped only after completion of conveyor operation/operation of plant so that possibility of dust settlement in ducts can be eliminated. Continuous evacuation of dust from air pollution control systems such as Dust catchers, ESPs, Bag filter hopper etc. shall be organized.

11. Siting Guideline for Sponge Iron Plants

Siting of new sponge iron plants shall be as per respective State Pollution Control Board guidelines. However the following aspects shall also be considered:

- (a) Residential habitation (residential localities/ village) and ecologically and/or otherwise sensitive areas: A minimum distance of at least 1000 m (1.0 km) to be maintained.
- (b) If any plant/clusters of plants are located within 1 km from any residential area/ village they may be shifted by State Pollution Control Board/ State Govt. in a phased manner for which a time bound action plan is to be prepared by SPCBs.
- (c) The location of Sponge Iron Plant should be at least 500 m away from National Highway and State Highway.
- (d) Radial distance between two Sponge Iron Plants should be 5 km for plants having capacity 1000 TPD or more.
- (e) Sponge Iron Plants can be established in designated industrial areas / Estates as notified by State Govt.