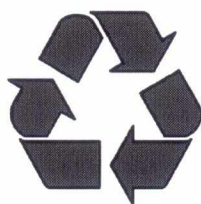


**Standard Operating Procedure and Checklist of Minimal
Requisite Facilities for utilization of hazardous waste
under Rule 9 of the Hazardous and Other Wastes
(Management and Transboundary Movement) Rules, 2016**

**Utilization of Spent Carbon (Carbon Residue) generated from
Urea Fertilizer Industry**



March, 2017

Central Pollution Control Board
(Ministry of Environment, Forest & Climate Change, Government of India)
Parivesh Bhawan, East Arjun Nagar,
Shahdara, Delhi – 110032

Pre-2

**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon
(Carbon Residue) generated from Urea fertilizer Industry**

Procedure for grant of authorisation by SPCBs/PCCs for utilization of Hazardous Waste

- (i) While granting authorisation for utilization of hazardous wastes, SPCBs/PCCs shall ensure the following:
- a. The waste (intended for utilization) belongs to similar source of generation as specified in SoPs.
 - b. The utilization process is similar to the process of utilization described in SoPs.
 - c. End-use / product produced from the waste shall be same as specified in SoPs.
 - d. Authorisation be granted only after verification of utilization process and minimum requisite facilities as given in SoPs.
 - e. Issuance of passbooks (similar to the passbooks issued for recycling of used oil, waste oil, non-ferrous scrap, etc.) for maintaining records of receipt of hazardous wastes for utilization.
- (ii) After issuance of authorization, SPCB shall verify the utilization process, checklist and SOPs on quarterly basis for initial 2 years; followed by random checks in the subsequent period for atleast once a year.
- In-case of lack of requisite infrastructures with the SPCB/PCC, they may engage 3rd party institutions or laboratories having EPA/NABL/ISO17025 accreditation/recognition for monitoring and analysis of prescribed parameters in SoPs for verification purpose.
- (iii) SPCBs shall provide half yearly updated list of units permitted under Rule 9 of HOWM Rule, 2016 to CPCB and also upload the same on SPCB website, periodically. Such updated list shall be sent to CPCB on a half yearly basis i.e by July and January respectively.
- (iv) Authorisation for utilisation shall not be given to the units located in the State/UT where there is no Common TSDF, unless the unit ensures authorised captive disposal of the hazardous waste (generated during utilisation) or its complete utilisation or arrangement of sharing with any other authorised disposal facility.
- (v) In case utilization proposal is not similar with respect to source of generation or utilization process or end-use as outlined in this SoP, the same may be referred to CPCB for clarification / conducting trial utilization studies and developing SoPs thereof.
- (vi) The source and work zone standards suggested in the SoPs are based on the E(P)A notified and OSHA standards respectively, however, SPCB/PCC may impose more stringent standards based on the location or process specific conditions.

25.0 Utilization of Spent Carbon (Carbon Residue)

Type of HW	Source of generation	Recovery/Product
Spent Carbon (carbon Residue – listed at Sl No. 18.2 of Schedule-I of HOWM Rules, 2016	From Urea Manufacturing plant	Carbon Black

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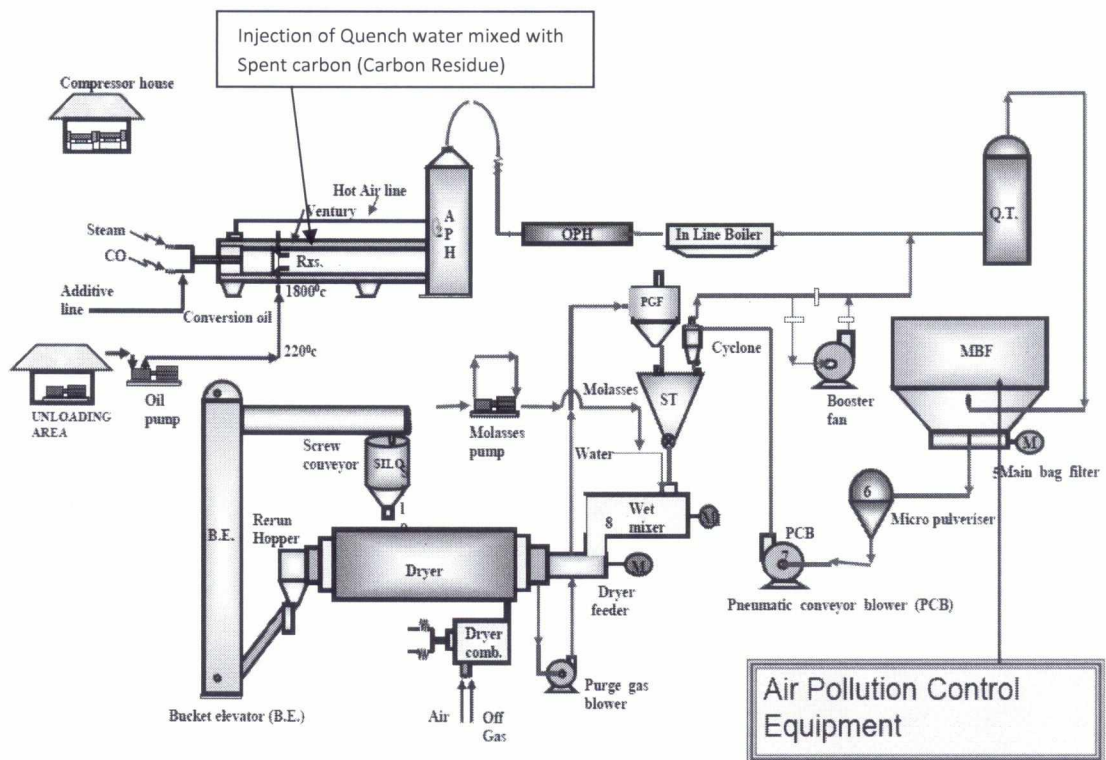
Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon (Carbon Residue) generated from Urea fertilizer Industry

25.1 Source of Waste

The Spent Carbon (Carbon Residue) is generated during the thermal cracking of hydrocarbon for manufacturing of urea fertilizer. The Spent carbon (Carbon Residue) is categorized as hazardous waste under S.No 18.2 of schedule-I of HOWM Rules, 2016, which are required to be disposed in authorized disposal facility in accordance with authorization condition, when not utilized in manufacturing of Carbon black.

25.2 Utilisation Process

The process involves utilization of Spent Carbon (Carbon Residue) in carbon black industry to reduce consumption of raw material (Carbon black feedstock) to achieve resource recovery. Carbon Residue is mixed with quench water and is used as quench liquor at a temperature of about 2000 °C in the reactor (where partial combustion/pyrolysis of carbon black feed takes place) to reduce the temperature and in process, carbon in the Carbon Residue becomes part of the product i.e. carbon black.



25.3 Product Usage / Utilization

The Spent Carbon (Carbon Residue) mixed with water for quenching of hot gases in the said Reactor to regulate the temperature of flue gas and the carbon present in the slurry contributes as supplementary resource in manufacturing of carbon black.

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**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon
(Carbon Residue) generated from Urea fertilizer Industry**

25.4 Standard Operating Procedure for utilization

This SoP is applicable only for utilization of Spent carbon (Carbon Residue) generated from Urea fertiliser manufacturing plant, as a supplementary resource in manufacturing of Carbon Black.

- (1) The Spent Carbon (Carbon Residue) (with 85 % moisture) shall be procured in non-reactive drums/container in accordance with the provisions stipulated in Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- (2) There should be a designated space for storage of Spent Carbon (Carbon Residue) under cool, dry, well ventilated and covered storage shed, as authorized by the concerned SPCB/PCC under the HoWM Rules, 2016 so as to eliminate water intrusion. Such shed shall have impervious lined floor, adequate slope, seepage collection pit. The loading/unloading space for Spent Carbon (Carbon Residue) shall also be under the covered shed.
- (3) The seepage from the collection pit shall be pumped to mixing vessel/ slurry preparation tank (where Spent carbon is mixed with water) to feed the same into the Carbon Black Reactor.
- (4) The Spent Carbon (Carbon Residue), if not in cake form shall be stored in silo. Loading of spent carbon into silo shall be carried out mechanically using pump.
- (5) The spent carbon (Carbon Residue) shall be directly transferred to slurry preparation tank through mechanised system with no manual handling.
- (6) Utilisation of Spent Carbon (dry weight) shall not exceed 5 % to the product i.e Carbon black manufactured.
- (7) The carbon slurry mixed with water from the slurry preparation tank shall be injected as quench liquor through pipeline into the reactor.
- (8) The reactor shall maintain temperature not less than 2000°C.
- (9) Utilization of spent carbon shall not be carried out during unstable/breakdown conditions in the reactor.
- (10) The unit shall ensure that all personnel involved in the plant operation shall wear proper personal protective equipment such as masks, gloves, goggles, shoes etc. for safety, suitable for power plant operation.
- (11) Prior to utilization of Spent Carbon (Carbon Residue), the unit shall obtain authorization for generation, storage and utilisation of Spent Carbon (Carbon Residue) from the concerned State Pollution Control Board, under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016,
- (12) The hazardous wastes (viz. contaminated gloves, masks, dusters, liners, etc., as applicable) generated from utilization process shall be collected, and stored temporarily in drums/bags in a dedicated hazardous waste storage area within the

Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon (Carbon Residue) generated from Urea fertilizer Industry

unit premises. The same shall be sent to Common hazardous waste treatment, storage and disposal facility (TSDF) or other authorized facility, within 90 days from generation of waste. Such storage area shall be covered and properly ventilated.

- (13) Transportation of the aforesaid waste shall be carried out by the sender or receiver (utilizer) after obtaining authorization from the concerned SPCB under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.
- (14) In case of environmental damages arising due to improper handling of hazardous wastes (viz., accidental spillage during generation, storage, processing, transportation and disposal), the unit shall be liable to implement immediate corrective measures, environmental site assessment and remediation of contaminated soil/groundwater/sediment etc. as per the "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Wastes and Penalty" published by CPCB.
- (15) During the process of utilization and handling of hazardous waste, the unit shall comply with the requirements in accordance with the Public Liability Insurance Act, 1991 as amended, wherever applicable.

25.5 Records & Returns

- (1) The unit shall maintain a passbook issued by concerned SPCB/PCC wherein the following details with respect to each procurement of Spent Carbon (Carbon Residue) shall be entered:
 - Address of the sender
 - Date of dispatch
 - Quantity procured
 - Seal and signature of the sender
 - Date of receipt in the premises
- (2) The unit shall submit quarterly and annual information on Spent carbon (Carbon Residue) consumed, quantity utilised, product manufactured, hazardous waste generated, resources conserved (specifying the details like type and quantity of resources conserved) etc., to the concerned SPCB.
- (3) A log book shall be maintained with information on source, quantity, date wise utilization of Spent Carbon (Carbon Residue), product recovered, hazardous waste generated, etc. and record of analysis report of emission monitoring & effluent discharged, as applicable shall be maintained.
- (4) The unit shall maintain record of hazardous waste generated, utilised and disposed as per Form 3 & shall file annual returns in Form 4 as per Rule 20 (1) and (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, to SPCB.

**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon
(Carbon Residue) generated from Urea fertilizer Industry**

25.6 Standards

- (i) Source emission standards for Particulate Matter, SO₂, NO_x, heavy metals (Cd, Th + their compounds; Co, Mn, Ni, Cr, Sb, As, Pb, Cu, V + their compounds) shall comply with the standards notified under the Environment (Protection) Act, 1986 vide Notification No. G.S.R. 481(E) dated 26/06/2008 for Common Hazardous Waste Incinerators or as prescribed by the concerned SPCB/PCC, whichever is stringent.
- (ii) Monitoring of the specified source emissions shall be carried out quarterly. The monitoring shall be carried out by NABL/EPA accredited laboratories and the results shall be submitted to the concerned SPCB quarterly.

25.7 Siting of Industry

This SOP is applicable only for utilization of Spent Carbon in the Carbon black manufacturing Industry which is already in operation and cited in accordance with Consent to Establish issued by the concerned SPCB/PCC.

25.8 Size of Plant & Efficiency of utilisation

Utilisation of Spent Carbon (dry weight) shall not exceed 5 % to the product i.e Carbon black manufactured. Hence, requisite facilities of adequate size shall be installed accordingly as mentioned under para 25.10 below.

25.9 On-line detectors / Alarms / Analysers

Online emission analysers for PM, SO₂ and NO_x in the stack shall be installed and the online data be connected to the server of the concerned SPCB/PCC and CPCB.

25.10 Checklist of Minimal Requisite Facilities:

S.No	Requisite Facilities
1.	Designated space for storage of Spent Carbon (Carbon Residue) under cool, dry, well ventilated and covered storage shed, so as to eliminate water intrusion.
2.	Storage shed with impervious lined floor, adequate slope, seepage collection pit
3	The loading/unloading space for Spent Carbon (Carbon Residue) under covered shed.
4.	Mechanised systems for handling & transfer of Spent carbon from storage shed to mixing vessel.
5.	Mixing vessel/slurry preparation tank with appropriate mechanised system for mixing of Spent carbon with water.

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**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for Utilization of Spent Carbon
(Carbon Residue) generated from Urea fertilizer Industry**

6.	Pumping system for transfer of collected seepage from seepage pit into mixing vessel/ slurry preparation tank
7.	Piping arrangement for injecting the mixed slurry into carbon black reactor.
8.	Carbon Black Reactor(s)
9.	Air Preheater
10.	Oil Preheater
11.	Waste Heat Recovery Boiler
12.	Air Pollution Control Systems
13.	Stack of height as prescribed by SPCB with easy access to port hole, for conducting stack monitoring
14.	Online analyzers for monitoring Particulate Matter, SO ₂ and NO _x emission in stack and the online data be connected to the server of the concerned SPCB/PCC and CPCB.

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