

**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 Acetic acid (generated from Pharma industry: 7ADCA  
and Paracetamol manufacturing processes respectively) for the recovery of  
Acetic acid (for use in the textile and dyeing industries)**



**July, 2025**

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

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**Procedure for grant of authorization by State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) for utilization of Hazardous waste**

- 1) While granting authorization for utilization of hazardous wastes, SPCBs/PCCs shall ensure that authorization is given only to those wastes for which Standard Operating Procedures (SOPs) for utilisation have been circulated by Central Pollution Control Board (CPCB) ensuring the following:
  - a. The waste (intended for utilization) belongs to similar source of generation as specified in SOP.
  - b. The utilization shall be similar to that as described in SOP.
  - c. End-use/ product produced from the waste shall be same as specified in SOP.
  - d. Authorization shall be granted only after verification of details and minimum requisite facilities as given in SOP.
  - e. Issuance of passbooks (similar to passbooks issued for recycling of Spent acetic acid etc.) for maintaining records of receipt of hazardous waste for utilization.
  - f. Monitor closely the quantity of hazardous waste (Spent acetic acid) being sent by generators and the quantity being utilized by authorized facilities in production of Acetic Acid.
- 2) After issuance of authorization, SPCBs/PCCs shall verify the compliance of checklist and SOP on quarterly basis for initial 1 year; followed by random checks during subsequent period for at least once a year. The compliance reports may be submitted to CPCB.
- 3) In-case of lack of requisite infrastructures with the SPCBs/PCCs, they may engage 3<sup>rd</sup> party institutions or laboratories having EPA, 1986/NABL/ISO17025 accreditation/ recognition for monitoring and analysis of prescribed parameters in SOPs for verification purpose.
- 4) SPCBs/PCCs shall provide half yearly updated list of units permitted under Rule 9 of Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 (HOWM Rules, 2016) to CPCB and also upload the same on SPCB/PCC website, periodically.
- 5) Authorization for utilisation shall not be given to the units located in the State/Union Territory 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.
- 6) In case of the 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.
- 7) The source and work zone standards suggested in the SOP are based on EPA notified and OSHA standard respectively, however, SPCBs/PCCs may impose more stringent standards based on the location or process specific conditions.
- 8) SPCBs/PCCs shall ensure that the utilizer of Spent Acetic acid shall maintain daily records in National Hazardous Waste Tracking System (NHWTS).



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**119.0 Utilization of Spent Acetic Acid:**

Type of HW	Source of generation	Recovery/Product
Spent Acetic Acid (Schedule-I, Cat-28.1 of HOWM Rules, 2016)	Generated from Pharma industry: 7ADCA and Paracetamol manufacturing processes respectively	Recovery of Acetic Acid for use in the textile and dyeing industries

**119.1 Source of Waste**

Spent Acetic Acid (generated from Pharma industry: 7ADCA and Paracetamol manufacturing processes respectively) are categorized as Hazardous waste listed Schedule-I, Cat-28.1 of HOWM Rules, 2016 which is required to be disposed in an authorized disposal facility in accordance with authorization condition, when not utilized as resource recovery. The Typical characteristics of Spent Acetic Acid is shown below in Table 1.

**Table 1: Typical Characteristics of Spent Acetic Acid**

Sr. No.	Parameter	Unit (SI)	Results of Spent Acetic acid (from Paracetamol)	Results of Spent Acetic acid (from 7 ADCA)
1.	pH	--	2.60 - 2.72	2.32 - 2.35
2.	Moisture Content	%	72.3 - 75.6	82.5 - 84.3
3.	H2SO4 Content	%	0.81 - 0.92	2.41 - 2.60
4.	H2O2	%	0.98 - 1.18	1.54 - 1.57
5.	Strength	%	23.22 - 23.35	13.50 - 13.57
6.	COD	mg/ L	184688 - 190896	121056 - 124160
7.	TOC	mg/ L	1234.67 - 1389	2500.2 - 3549.67
8.	Cyanide	mg/ L	BDL	BDL
9.	Lead	mg/ L	BDL	0.64 - 0.79
10.	Arsenic	mg/ L	BDL	BDL
11.	Mercury	mg/ L	0.009 - 0.015	0.002 - 0.023
12.	Nickel	mg/ L	0.40 - 0.41	0.56 - 0.69
13.	Chromium	mg/ L	0.07	0.15 - 0.17
14.	Copper	mg/ L	0.20 - 0.30	0.13 - 0.16
15.	Zinc	mg/ L	0.11 - 0.12	0.19 - 0.23

*Note: SPCBs/PCCs to check the characteristics of Spent acetic acid prior to issuance of authorization, any significant deviation with respect to typical values mentioned in the table above may be examined with respect to the source or may be referred to CPCB*

**119.2 Utilization Process**

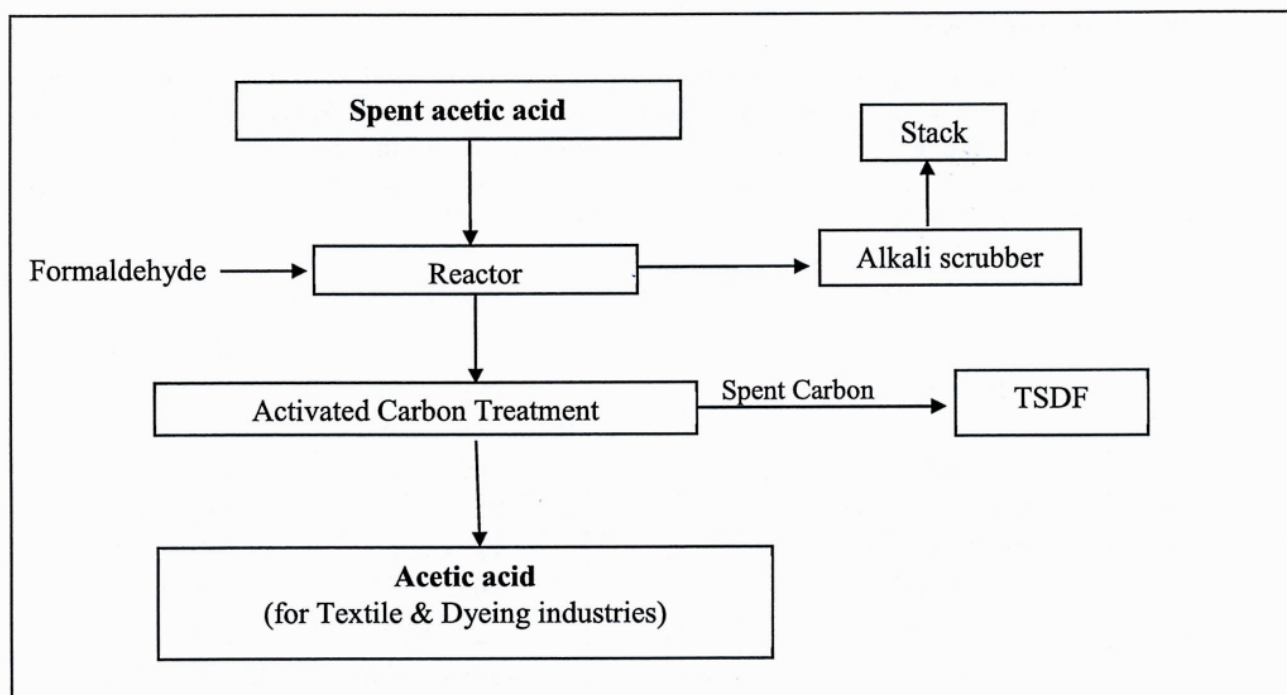
The Spent acetic acid contains residual hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), an oxidizing agent that needs to be neutralized prior to reuse. To achieve this, a 30–35% formaldehyde solution is added to the spent acetic acid. The treated mixture is then retained for a period of 6 to 8 hours to ensure complete reaction.

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Following the neutralization process, the acetic acid undergoes further purification through activated carbon treatment to remove any remaining impurities and ensure it meets the required quality specifications for end users.

The treated acetic acid is subsequently reloaded into tanker vehicles for supply to textile and dyeing industries. The spent activated carbon generated from the purification step is collected and disposed of through an authorized Treatment, Storage, and Disposal Facility (TSDF) as per the provisions stipulated by concerned SPCB/PCC.



**Figure 1: Process flow diagram for utilization of spent acetic acid for recovery of Acetic acid**

### **119.3 Standard Operating Procedure for utilization**

This SOP is applicable only for Utilization of Spent Acetic Acid (generated from Pharma industry: 7ADCA and Paracetamol manufacturing processes respectively) for the recovery of Acetic acid (for use in the textile and dyeing industries).

- 1) The Spent Acetic acid shall be procured only in SPCB/PCC authorised barrels/closed tanks mounted over vehicles fitted with requisite safeguards ensuring no spillage of the same.
- 2) There shall be a designated space for unloading of Spent Acetic acid to the storage tank.
- 3) The Spent Acetic acid shall be stored in dedicated HDPE tanks/ rubber lined steel tank / other suitable storage tanks. The receiving storage tank shall be placed above the ground with imperviously lined flooring and contained with low raise parapet/bund wall with slope to collect spillages, if any, into the collection pit.

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- 4) The unit shall install storage tanks under cool, dry, well ventilated covered storage shed(s) within premises, as authorized by the concerned SPCB/ PCC under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

Further, the storage area of Spent Acetic Acid shall have leak-proof floor tiles with adequate slope to collect spillage, if any, into a collection pit. The spillage from collection pit shall be transferred to ETP, as the cases may be, through chemical process pump.

- 5) The unloading, storage, transfer and other handling of Spent Acetic acid from entire utilization process shall be carried out through dedicated mechanical transfer pump with fixed pipeline in closed system. Manual handling shall be strictly prevented.
- 6) The unit shall provide separate storage tanks for storage of other raw materials (i.e., Formaldehyde) and the storage tanks should be at designated place with proper cover and with acid brick lining floors.
- 7) The unit shall provide activated carbon treatment to treat the acetic acid to meet quality requirement prior to sending to end users.
- 8) Adequate alkali scrubbing system shall be provided to the Acetic Acid storage tanks and the reactors to control the source emissions along with scrubber liquor treatment and handling system.
- 9) The treated gases shall comply with emission norms prior to dispersion into atmosphere through stack. The stack height shall be minimum of 30m from ground level or as prescribed by the concerned SPCB/PCC, whichever is higher.
- 10) The unit shall maintain proper ventilation in the work zone and process areas by providing extraction system. All personnel involved in the plant operation shall wear proper personal protective equipment (PPE) specific to the process operations involved and type of chemicals handled as per Material Safety Data Sheet (MSDS). The safety precautions of the worker shall be in accordance with the Factory Act, 1948, as amended from time to time.
- 11) Treatment and disposal of wastewater: Wastewater generated from floor-washings, spillages, equipment washing, scrubber bleed shall be treated Physico-Chemically in an ETP or may be sent to CETP for final disposal or be treated further in a captive facility to comply with surface water discharge standards.
- In case of zero discharge condition by SPCB / PCC, the treated waste water from ETP may be managed as per conditions stipulated by the SPCB / PCC.
- 12) The treated effluent shall be discharged in accordance with the conditions stipulated in the Consent to Operate issued by concerned SPCB / PCC under the Water (Prevention and Control of Pollution) Act, 1974.
- 13) The hazardous wastes generated (i.e Spent Carbon) shall be collected and temporarily stored in non-reactive drums/ bags under a dedicated hazardous waste storage area and be sent to authorized common TSDF or MEE or other authorized facility within 90 days from generation of the waste in accordance with the authorization issued by the concerned SPCB/PCC. Such storage area shall be covered with proper ventilation.

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- 14) It shall be ensured that the Spent Acetic Acid is procured from the industries, which have valid authorization from the concerned State Pollution Control Board as required under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- 15) Transportation of Spent Acetic Acid shall be carried out by sender (generator) or receiver (utilizer) only after obtaining authorization from the concerned SPCB under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Requisite manifest document shall be followed as laid down under the said Rules.
- 16) Prior to utilization of Spent Acetic Acid, the unit shall obtain authorization for collection, storage and utilization of Spent Acetic Acid from the concerned SPCB/PCC under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- 17) In case of environmental damages arising due to improper handling of hazardous wastes including accidental spillage during generation, storage, processing, handling, transportation and disposal, the occupier (sender or receiver, as the case may be) shall be liable to implement immediate response 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.
- 18) The unit shall provide suitable fire safety arrangements and flame proof electrical fittings.
- 19) During the process of utilization and handling of hazardous waste the unit shall comply with requirement in accordance with the Public Liability Insurance Act, 1991 as amended, wherever applicable. The unit shall provide suitable fire safety arrangements and flame proof electrical fittings.

**119.4 Product Usage / Utilization**

1. Hazardous waste i.e. Spent Acetic Acid shall be used for recovery of acetic acid and the recovered Acetic Acid shall be restricted to in the textile and dyeing industries only.
2. The recovered Product i.e. Acetic Acid shall comply Bureau of Indian (BIS) Standards IS 695(2020) and amendments thereof, for further respective end use. The unit has to ensure that the product meets both the quality standards required by end users i.e., the textile and dyeing industries.
3. The unit shall label its product i.e. Acetic Acid prepared by utilizing aforesaid Spent Acetic Acid as "*This Acetic Acid (for use in the textile and dyeing industries) has been prepared by utilizing Spent Acetic Acid generated from Pharma industry: 7ADCA and Paracetamol manufacturing processes respectively*".

**119.5 Record>Returns Filing**

- 1) The unit shall maintain a passbook issued by concern SPCB/PCC and maintain details of each procurement of Spent Acetic Acid as mentioned below:
  - Address of the sender
  - Date of dispatch
  - Quantity procured



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- Seal and signature of the sender
  - Date of Receipt in the premises
- 2) A logbook with information on source and date of procurement of Spent Acetic Acid, date wise utilization of the same, hazardous waste generation and its disposal, etc. shall be maintained including analysis report of fugitive emission monitoring & effluent discharged as applicable.
  - 3) The unit shall maintain record of hazardous waste generated, utilized and disposed as per Form-3 & also file annual return in Form-4 as per Rule 20(1) and (2) of HOWM Rules, 2016, to concerned SPCB/PCC.
  - 4) The unit shall submit quarterly and annual information on hazardous wastes consumed, its source, products generated or resources conserved (specifying the details like, type and quantity of resources conserved) to the concerned SPCB/PCC.
  - 5) Each procurement, production and transportation details (along with quantity of hazardous waste generated & disposed) shall be maintained on the National Hazardous Waste Tracking System developed by CPCB. Unit shall use NHWTS to manage the manifest, enter daily records of quantity generated, disposed, etc.

**119.6 Standards**

- 1) Source emissions from the stack connected to reactors/process stack shall comply with the following standards or as prescribed by the concerned SPCB/PCC, whichever is stringent;

Parameters	Standards
PM	50 mg/Nm <sup>3</sup>
Acid Mist (CH <sub>3</sub> COOH)	50 mg/Nm <sup>3</sup>

- 2) Fugitive emission in the work zone area shall comply with the following standards:

Parameters	Standards
PM <sub>10</sub>	5 mg/m <sup>3</sup> , TWA* (PEL)
Acid Mist (CH <sub>3</sub> COOH)	25 mg/Nm <sup>3</sup>

*PEL- Permissible Exposure Limit; TWA-Time-weighted average: measured over a period of 8 hours of operation of process*

- 3) Fugitive emission monitoring for specified parameters shall be carried out quarterly. The monitoring shall be carried out by ISO 17025 accredited or EPA, 1986 approved laboratories and the results shall be submitted to the concerned SPCB/PCC on a quarterly basis.
- 4) Standard for wastewater discharge: Treated effluent (if any) shall be discharged in accordance with the conditions stipulated in Consent to Operate issued by concerned SPCB/PCC under the Water (Prevention and Control of Pollution) Act, 1974. In case of (i) zero discharge as per consent or (ii) non-availability of common Effluent Treatment Plant (CETP), the unit shall achieve zero discharge by setting up adequate captive treatment facility.



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**119.7 Siting of Industry**

Facilities for utilization of Spent Acetic Acid shall be preferably located in a notified industrial area or industrial park/estate/cluster and in accordance with Consent to Establish/NOC issued by the concerned SPCB/PCC.

**119.8 Size of Plant and Efficiency of Utilisation**

During the trial run for utilization of Spent Acetic Acid for recovery of Acetic Acid it was observed yield of the utilization process as 99.3 %. Therefore, requisite facilities of adequate size of storage shed and other plant & machineries shall be installed accordingly.

**119.9 On-line detectors/ Alarms/ Analysers**

In case of continuous process operations, online emission analyzers for PM in the stack shall be installed and the online data be connected to the server of the concerned SPCB/PCC.

**119.10 Checklist of Minimal Requisite Facilities**

S. No	Particulars
1.	Storage tanks of adequate capacity to store Spent Acetic Acid. Such storage tanks shall be placed above the ground and contained with low rise parapet/bund wall and acid proof floor with slope to collect spillages, if any, in to collection pit.
2.	Cool, dry well-ventilated covered sheds for Spent Acetic Acid storage tanks, product storage tanks and process activities within premises and dedicated hazardous storage area for temporary storage of hazardous waste generated during utilization process.
3.	Spare vessel to transfer the reaction mass, if any, in case of leakage or damage to the reaction vessel.
4.	Mechanized system for handling & transfer of Spent Acetic Acid
5.	Pumps, pipes, and other equipment for mechanical handling of Spent Acetic Acid.
6.	Reactor, Activated carbon treatment system
7.	Adequate alkali scrubbing system shall be provided to the Acetic Acid storage tanks and the reactors to control the source emissions along with scrubber liquor treatment and handling system.
8.	Stack to have sampling port, platform, access to the platform etc. as per the guidelines on methodologies for source emission monitoring published by CPCB under Laboratory Analysis Techniques LATS/80/2013-14.
9.	In case of continuous process operations, online emission analyzers for PM in the stack shall be installed and the online data be connected to the server of the concerned SPCB/PCC.

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