

**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 Used/Waste Thinner for manufacturing of  
Industrial Primer to be used as Automotive Paints**



**cpcb**

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**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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**Standard Operating Procedure and Checklist of Minimal Requisite Facilities - Utilization of Used/Waste Thinner for manufacturing of Industrial Primer to be used as Automotive Paints**

**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/PCC 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 3<sup>rd</sup> party institutions or laboratories having EPA/NABL/ISO17025 accreditation/recognition for monitoring and analysis of prescribed parameters in SoPs for verification purpose.
- (iii) SPCBs/PCCs 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 half yearly 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.

**42.0 Utilization of Used/Waste Thinner**

| Type of HW                                                                       | Source of generation                           | Recovery/Product                                                   |
|----------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------|
| Used Waste Thinner (category no. 21.2 as per Schedule I of the HOWM Rules, 2016) | Cleaning of Paint Feeding Lines using Solvents | Manufacturing of Industrial Primer to be used as Automotive paints |

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#### 42.1 Source of Waste

The Spent Solvent (Used Waste Thinner) is generated during cleaning of paint feeding lines using thinners (solvents) in paint shops of automobile industries. The above mentioned Hazardous Waste falls under the category No. 21.2 (Spent Solvent from Production or industrial use of paints, pigments, lacquers, varnishes and inks) under Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Used/Waste Thinners usually contain paint content which varies from 10 to 40 %. Typical characteristic of the Used/Waste Thinner (Spent Solvent) is as given below;

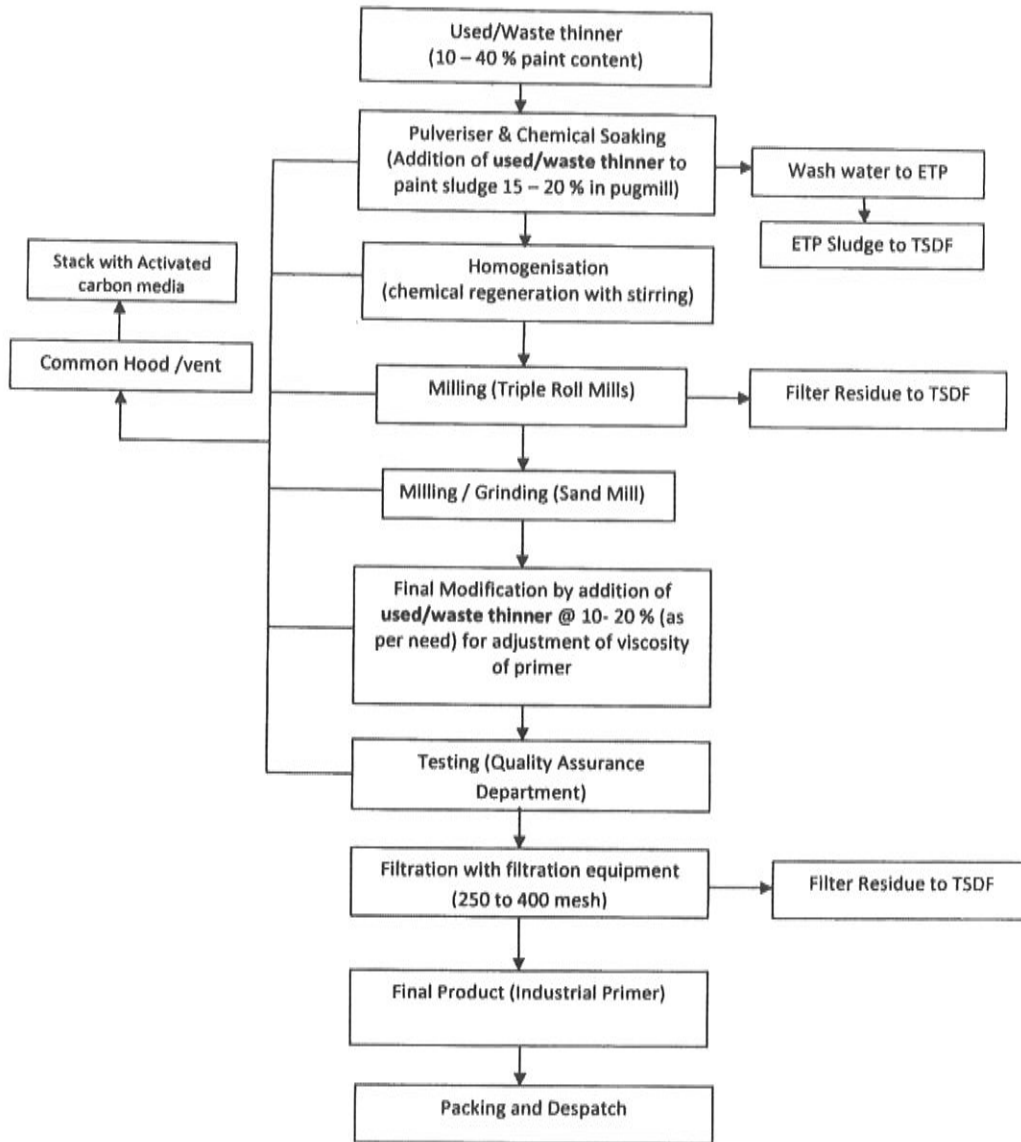
| S.No | Parameter              | Percentage |
|------|------------------------|------------|
| 1.   | Toluene                | 2 to 10 %  |
| 2.   | Xylene                 | 10 to 30 % |
| 3.   | Mineral Turpentine Oil | 20 to 40 % |
| 4.   | C-9                    | 20 to 70 % |
| 5.   | Di Acetone Alcohol     | 2 to 20 %  |
| 6.   | Butyl Alcohol          | 2 to 15 %  |
| 7.   | Butyl Cellosolve       | 2 to 5 %   |

#### 42.2 Utilization Process

Used waste thinner is used in place of virgin thinner to manufacture industrial primer from paint sludge (solvent based). The paint sludge (5-10 % moisture) is washed with fresh water and allowed to dry in the pug mill by mixing. The wash water generated in the pugmill, if any shall be collected and treated in the Effluent Treatment Plant. The paint sludge (2-2.5 % moisture) is soaked and pulverized in the pug mill using used / waste thinner (15 - 20 % by volume). After that, the soaked mixture is added with additives, used/waste thinners, resins and pigments to attain the required color and texture in the final product (industrial primer) with continuous stirring in the homogenizer. The chemicals/additives are determined based on the properties and colour required in the final product (industrial primer). The blended mixture is sent to milling/grinding like Triple Roll Mill for coarse filtration followed by Sand mill for further homogenization. Used / Waste thinners are again added at the rate of 10-20 % to attain the required viscosity as per the specifications of the final product (industrial primer). The mixture is again filtered in the filtration equipment of 250 to 400 mesh, followed by quality check and packaging. The filtration residue generated is collected and disposed in the Hazardous Waste TSDF as per authorization issued by the concerned SPCB/PCC. The process flow sheet of utilization of used/waste thinner is provided as below;

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**Figure 1. Manufacturing of Industrial Primer from Used / Waste Thinner (Spent Solvent)**

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**42.3 Product Usage / Utilization**

Industrial Primer manufactured using used / waste thinner shall be utilized in automotive paints.

**42.4 Standard Operating Procedure (SoP) for utilization**

This SoP is applicable for manufacturing of industrial primer using used/waste thinner generated during cleaning of paint feeding lines in automotive paint shops.

- (1) Used/Waste thinner shall be procured and transported in tankers / drums through authorized vehicles as stipulated in the HoWM Rules, 2016.
- (2) The Used/Waste thinner in tankers/drums shall be transferred in the designated storage place which shall be above the ground with low raise bund wall or in storage tankers underground as authorized by concerned SPCB/PCC. The same shall be clearly labelled and stored away from direct sunlight/other heating sources and preferably, in a cool, well-ventilated store constructed of fire-resisting materials, as authorized by the concerned SPCB/PCC under the HoWM Rules, 2016.
- (3) Measures should be taken to prevent entry of runoff into the storage area. The storage area shall be designated in such a way that the floor level is at least 150 mm above the maximum flood level.
- (4) Used/waste thinners shall be transferred mechanically to the soaking pit for soaking the paint sludge and conveyed to the homogenization tank through solvent transfer pump. There shall be no manual handling of the hazardous wastes (Used/Waste Thinner) and paint sludge.
- (5) The entire process area shall have leak-proof and chemical resistant flooring with adequate slope to collect spillages, if any, into a collection pit. In case of spills / leaks, dry adsorbents / cotton should be used for cleaning instead of water.
- (6) The vent of used/waste thinner storage tanks or area shall be connected to common stack for treatment using activated carbon.
- (7) The unit shall provide separate storage tanks for storage of chemicals and the storage tanks should be at designated place with proper cover and with chemical resistant floors.
- (8) The unit shall ensure that the said utilization process and its associated activities shall be demarcated separately within the unit.
- (9) Used/waste thinner shall be mixed with other chemicals only in closed vessel reactors (homogenizer) having mechanized stirring system with retention time of 2-3 hours. The mixer shall be kept under covered shed with adequate safety gadgets provided to workers, as well as ensuring proper ventilation in the process area.

Volatile Organic Compounds are expected to be liberated from the said homogenization process where the used/waste thinner is added. Thus, the said reactor(s) shall be connected with hood over it to suck vapours, which shall be maintained under suction and connected to the common stack.

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- (10) The fugitive emission (Volatile Organic Compounds) from each unit process with potential VOC sources (like soaking, homogenizer, Triple Roll Mills, Sand Mills, filtration and packaging etc.), shall be provided with hood system, which is connected to a common vent followed by treatment in VOC adsorption media like activated carbon. The stack emission shall follow standard of Total Organic Carbon (TOC)  $\leq 20$  ppm.
- (11) The blended mixture be transferred mechanically to the Triple Roll Mill through chemical process pump. There shall be no manual handling of the hazardous wastes (Used/Waste Thinner).  
The Triple Roll Mill shall also be covered properly from all the sides so as to minimize the VOC emissions to the working environment and shall be provided with hood system connected to the common vent. The residue collected in the triple roll mill is disposed in common HW TSDF as authorized by concerned SPCB/PCC.
- (12) The mixture shall be transferred to the sand mill and filtration system mechanically through chemical process pumps.
- (13) The unit shall maintain proper ventilation in the work zone and process areas. All personnel involved in the plant operation shall wear proper personal protective equipment (PPE) specific to the process operations involved and type of solvents & chemicals handled as per MSDS. The safety precautions of the worker shall be in accordance with the Factory Act, 1948, as amended from time to time.
- (14) All the vessels used for homogenizing, mixing/blending and milling etc, should be closed to the extent possible. Vents and openings in the vessels should be provided with hoods connected to an exhaust system through activated carbon adsorption media.
- (15) The treated vapours shall comply with emission norms and shall be dispersed into atmosphere through stack of minimum height of 6 m above the roof top or as prescribed by the concerned SPCB/PCC, whichever is higher.
- (16) Treatment and disposal of wastewater: The sources of wastewater from utilization process are wash water from pug milling. The above waste water shall be treated in adequate Effluent Treatment Plant so as to comply with standards/conditions prescribed by the concerned SPCB/PCC.
- (17) It shall be ensured that Used/Waste thinner is procured from the industries that have valid authorization for the same from the concerned SPCB/PCC as required under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- (18) The hazardous waste generated (from coarse material from Triple Roll Mill, filter residues, contaminated cotton/wipes, raw materials / product spillages, ETP Sludge etc.) 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 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.
- (19) Transportation of Used/waste thinner and residues generated during utilization shall be carried out by the sender or receiver (utilize/TSDF operator) as per the authorization issued by concerned

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SPCB/PCC under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

- (20) Prior to utilization of used/waste thinner, the unit shall obtain authorization for generation, storage and utilization of used/waste thinner from the concerned State Pollution Control Board under the Hazardous and Other wastes (Management & Transboundary Movement) Rules, 2016.
- (21) In case of environmental damages arising due to improper handling of hazardous wastes including accidental spillage during generation, storage, processing, transportation and disposal, the unit 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.
- (22) The unit shall obtain license from Petroleum and Explosive Safety Organization, Govt. of India.
- (23) The unit shall provide suitable fire safety arrangements and flame proof electrical fittings. All the storage tanks and vehicles entering the premises shall be fitted with spark arrestors.
- (24) 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.

**42.5 Records/Return Filing**

- (1) The unit shall maintain a passbook issued by concerned SPCB wherein the following details of each procurement of used/waste thinner 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) A log book shall be maintained with information on source and date of procurement of used/waste thinner, quantity, date wise utilization of the same, hazardous waste generation and its disposal, etc.
- (3) The unit shall maintain record of hazardous waste utilised, hazardous waste generated 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 concerned SPCB.

**42.6 Standards**

- (1) Fugitive emissions in the work zone shall comply with following standards:
  - Benzene - 1 ppm TWA\*  
5 ppm STEL\*

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|                          |                             |
|--------------------------|-----------------------------|
| • Lead                   | - 50 µg/m <sup>3</sup> TWA* |
| • Xylenes                | - 100 ppm TWA*              |
| • Acetone                | - 1000 ppm TWA*             |
| • Toluene                | - 200 ppm TWA*              |
| • Methanol               | - 200 ppm TWA*              |
| • Isopropyl alcohol      | - 400 ppm TWA*              |
| • 1-propanol             | - 200 ppm TWA*              |
| • N-Heptane              | - 500 ppm TWA*              |
| • Methyl Isobutyl Ketone | - 100 ppm TWA*              |
| • Ethyl benzene          | - 100 ppm TWA*              |
| • 2-ethoxy ethyl acetate | - 100 ppm TWA*              |
| • Butanol                | - 100 ppm TWA*              |
| • Ethanol                | - 1000 ppm TWA*             |
| • Ethyl Acetate          | - 400 ppm TWA*              |
| • Isopropyl alcohol      | - 400 ppm TWA*              |

*\*TWA-Time weighted average; \*STEL-Short Time Exposure Limit*

Among above, all or other relevant parameters of VOC emissions shall be analyzed in the work zone, as applicable, depending upon the composition of Used/Waste thinner utilized for the manufacturing of primer.

- (2) Emissions from stack attached to the common vent from the process area shall comply with the following:

- TOC ≤ 20 ppm

- (3) The Product (industrial primer) shall comply with the following standards;

- (a) The Volatile Organic Compounds (VOCs) in the product (i.e industrial primer) shall not exceed 540 g/l, as stipulated under Schedule II of "The Volatile Organic Compounds in Paints, Varnishes and Vehicle Refinishing Products Regulations 2012" published under European Communities Act, 1972.
- (b) The lead in product (i.e industrial primer) shall not exceed 90 ppm, as stipulated in IS 133 part 2): 2013 for commercial/industrial applications.

The Product (industrial primer) shall comply with the standards for Heavy metals (Cr (VI), Cd and their compounds etc.) and other parameters, as prescribed by Statutory or other authorities, from time to time, if any.

- (4) Monitoring of the specified parameters for source emission shall be carried out quarterly for the first year followed by atleast annually in the subsequent year of utilization. Fugitive emission for specified parameters shall be carried out quarterly. The monitoring shall be carried out by NABL accredited or EPA approved laboratories results shall be submitted to the concerned SPCB/PCC quarterly.

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- (5) Standards for wastewater discharge: The treated waste water shall be discharged in accordance with the conditions stipulated in the Consent to Operate issued by respective SPCB/PCC under the Water (Prevention and Control of Pollution) Act, 1974. In case of zero discharge or no discharge condition stipulated in the said Consent or non-availability of the Common Effluent Treatment (CETP), zero discharge shall be met.

**42.7 Siting of Industry**

Facilities for processing of used/waste thinner shall preferably be located in an industrial area in accordance with Consent to Establish issued by the concerned SPCB/PCC.

**42.8 Size of Plant & Efficiency of utilisation**

0.4 MT of Used/Waste thinner mixed with other additives yields 1 MT of the Primer. Therefore, requisite facilities of adequate size of storage shed and other plant & machineries as given in para 42.10 below shall be installed accordingly.

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

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

**42.10 Checklist of Minimal Requisite Facilities**

| S.No | Minimal Requisite Facilities                                                                                                                                                                                                                                                                                                                                                            |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Storage tanks / drums for receiving and storage of Used/Waste thinner                                                                                                                                                                                                                                                                                                                   |
| 2.   | Designated storage place which shall be above the ground with low raise bund wall or storage tankers underground as authorized by concerned SPCB/PCC. The same shall be clearly labelled and stored away from direct sunlight / other heating sources and preferably, in a cool, well-ventilated store constructed of fire-resisting materials, as authorized by the concerned SPCB/PCC |
| 3.   | Pug mill                                                                                                                                                                                                                                                                                                                                                                                |
| 4.   | Homogenizer with stirrer                                                                                                                                                                                                                                                                                                                                                                |
| 5.   | Milling / grinding equipments like Triple Roll Mill and Sand mill                                                                                                                                                                                                                                                                                                                       |
| 6.   | Filtration medium like nylon cloth                                                                                                                                                                                                                                                                                                                                                      |
| 7.   | Filtration equipment                                                                                                                                                                                                                                                                                                                                                                    |
| 8.   | Fire prevention facilities                                                                                                                                                                                                                                                                                                                                                              |

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|     |                                                                                                                                                                                                                                           |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.  | Suction arrangement to suck vapours from suction hood systems provided over each unit process (homogenization, milling/grinding (Triple Roll mill / Sand Mill), filtration, packaging etc.) and channelization of the same to common vent |
| 10. | VOC adsorption media i.e activated carbon in the stack connected to the common vent                                                                                                                                                       |
| 11. | Dedicated covered shed for storage of HW generated (filtration, raw materials/ product spillages etc.)                                                                                                                                    |
| 12. | Stack with 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.                             |
| 13. | Effluent Treatment plant                                                                                                                                                                                                                  |

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