



**GOVERNMENT OF KHYBER PAKHTUNKHWA
CLIMATE CHANGE, FORESTRY, ENVIRONMENT
AND WILDLIFE DEPARTMENT
(SECTION ENVIRONMENT)**

NOTIFICATION

Peshawar Dated the 25/07/2025

No. SO(ENVT)/CCFE&WD/1-8/EPC-2025: In exercise of powers conferred under Clause xxii of Section 7 of the Khyber Pakhtunkhwa Environmental Protection Act, 2014, (Khyber Pakhtunkhwa Act No. XXX of 2022), the Khyber Pakhtunkhwa Environmental Protection Council (EPC) in its 3rd Meeting held on 13.05.2025 has been pleased to approve the following guidelines for General Environmental Approval (GEA);

GUIDELINES FOR PHENOLIC RESINS BELOW 1,000 TONS PER ANNUM

INTRODUCTION:

PHENOLIC RESINS:

Phenol-formaldehyde resin, also known as phenolic resin, is a thermosetting plastic produced by the reaction between phenol and formaldehyde. Here's an overview of the manufacturing and processing of phenolic resin:

Properties:

Phenolic resin has low toxicity and flammability, for their excellent mechanical resistance, high heat resistance under load, and high impact resistance, phenolic resins are used in structural composite materials. When stored as a liquid, phenolic resin will gradually increase in viscosity over time due to a continuous reaction between the phenol and formaldehyde components, potentially leading to a darker color and thicker consistency, even if stored under proper conditions; this is why it's important to minimize this reaction, store liquid phenolic resin in a cool, well- ventilated area, in tightly sealed containers, and ideally at a consistent temperature.

Property	Value
Melting point (°C)	90-107
Boiling point (°C)	420
Vapour pressure (Pa)	3.18
Water solubility (g/L)	2.1
Density (g/cm ³)	1.24-1.32
Biodegradation	Non-biodegradable

Manufacturing Process:

1. Raw Material Preparation: Phenol and formaldehyde are prepared as raw materials.
2. Reaction: Phenol and formaldehyde are reacted in the presence of an acid or base catalyst to form a resin.



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CLIMATE CHANGE, FORESTRY, ENVIRONMENT
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(SECTION ENVIRONMENT)**

3. Condensation: The reaction mixture is then heated to facilitate condensation and the formation of a three-dimensional network.
4. Neutralization: The resin is neutralized to remove any excess acid or base.

Processing Techniques:

Molding: Phenolic resin can be molded using various techniques, such as compression molding, transfer molding, and injection molding.

1. Extrusion: Phenolic resin can be extruded to form rods, tubes, and other shapes.
2. Casting: Phenolic resin can be cast to form complex shapes and designs.

Applications:

1. Electrical Components: Phenolic resin is used in the production of electrical components, such as circuit boards and insulators.
2. Aerospace Industry: Phenolic resin is used in the aerospace industry for its heat-resistant properties.
3. Automotive Industry: Phenolic resin is used in the automotive industry for its durability and heat resistance.
4. Construction Industry: Phenolic resin is used in the construction industry for its insulation properties.

Safety Precautions:

1. Handling: Phenolic resin should be handled with care, as it can cause skin irritation and allergic reactions.
2. Ventilation: Good ventilation is essential when working with phenolic resin to prevent
3. Protective Gear: Protective gear, such as gloves and safety glasses, should be worn when working with phenolic resin.

Machineries used in the manufacturing and processing of phenolic resin :

- Agitated Tanks
- Static mixers
- High speed mixers
- Reaction vessels
- Curing ovens
- Autoclaves
- Compressing molding machines
- Transfer molding machines
- Extruders
- Grinders and crushers
- Sawing machines
- Drilling and machining Machines



**GOVERNMENT OF KHYBER PAKHTUNKHWA
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AND WILDLIFE DEPARTMENT
(SECTION ENVIRONMENT)**

- Mechanical testing machines

Environment Concerns with manufacturing and processing of phenolic resin

Air Pollution:

1. Volatile Organic Compounds (VOCs): phenolic resin production releases VOCs, contributing to air pollution and smog formation.
2. Particulate Matter: Processing and handling of phenolic resin can generate particulate matter, affecting air quality.

Water Pollution:

1. Chemical Contamination: phenolic resin production can contaminate water sources with chemicals like phenol, formaldehyde and other pollutants.
2. Wastewater Generation: Processing and cleaning of equipment can generate wastewater, which may contain hazardous chemicals.

Soil Pollution:

1. Chemical Spills: Accidental spills or leaks during phenolic resin production and processing can contaminate soil and groundwater.
2. Waste Disposal: Improper disposal of phenolic resin waste can lead to soil pollution.

Health Risks:

1. Respiratory Problems: Inhaling phenolic resin fumes can cause respiratory problems, such as asthma and other breathing difficulties.
2. Cancer Risk: Exposure to certain chemicals in phenolic resin production has been linked to an increased risk of cancer.
3. Prolonged exposure to phenolic resin fumes can cause neurological problems such as headaches, dizziness and nausea.

Climate Change:

1. Greenhouse Gas Emissions: phenolic resin production releases greenhouse gases, contributing to climate change.
2. Energy Consumption: Processing and manufacturing phenolic resin require significant energy, which can lead to increased greenhouse gas emissions.

Hazardous Waste:

phenolic resin production generates hazardous waste, which requires special handling and disposal.

To mitigate these environmental issues, phenolic resin production can adopt sustainable practices, such as:

1. Implementing cleaner production technologies
2. Reducing energy consumption and greenhouse gas emissions



**GOVERNMENT OF KHYBER PAKHTUNKHWA
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(SECTION ENVIRONMENT)**

3. Implementing waste minimization strategies can help reduce the environmental impact
4. Using alternative, eco-friendly solvents
5. Improving waste management and recycling practices
6. Enhancing employee training and safety protocols

The following mitigation measure should be adopted for Handling, Storage, Transportation and Unloading of the thinner less than 10000 gallon per annum

1. Store the raw materials in well- ventilated area
2. Store the raw materials and product away at least 50 feet from living area like office, residential room etc.,
3. Store the raw materials and product at least 100 feet away from heat sources, sparks and open flame
4. Store the raw materials in a shaded area or use UV resistant containers
5. Store the raw materials in a container specifically designed for flammable container
6. Ensure containers have tight fitting lids to prevent vapors from escaping
7. Labeled the containers with the contents (Phenol, formaldehyde) with warning sign (flammable, hazardous)
8. Placed the raw materials container in secondary containment system such as spill try or drum
9. Store away from incompatible materials that may react with it
10. Store in cool and dry place with control temperature
11. The condition of the raw materials container should be checked on quarterly bases for sign of damage, corrosions or leaks etc.,
12. Keep the storage area clean, organized and free from debris.
13. Fire hydrant system shall be installed.
14. Earthing/bonding shall be provided for static charges.
15. Only authorized person shall be permitted in storage tank area.
16. Provision of flame proof electrical fittings / equipment's.
17. Strict enforcement of no smoking and other ignition source nearby storage area.
18. Adequate number of caution boards highlighting the hazards of chemicals should be provided at critical locations.
19. Installation of impervious asphalt or concrete surfaces with polyethylene sheeting underneath in areas of potential leaks and spills, including below gauges, pipes, pumps and below truck loading / unloading areas.
20. Above Ground Storage Tanks should be located in a secure area, protected from potential collisions by vehicles, vandalism, and other hazards.



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**FORMAT OF GEA REPORT TO BE FILLED BY THE PROPONENT
OR VISITING OFFICER.**

File No. _____

Date _____

General Information

1. Project Name or Title _____

2. Project Proponent (Department, organization, or owner) _____

3. Address _____

4. Telephone _____

5. E-mail _____

6. Representative of the Proponent _____

7. Designation _____

8. Name of the person who conducted this assessment _____

9. Designation _____

Project Information

10. Project Location & GPS Coordinates _____

11. Cost of the Project _____

12. Area of the proposed land for the project _____ m²
Total _____ m²

Proposed covered _____ m²

Open space _____ m²

13. Brief Project Description _____

14. Design production capacity of the unit _____



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15. Number and type of qualification of required staff to run the project? _____

Construction

16. Who owns the proposed land for the project? _____

17. What is the present use of the land? _____

18. Are there any settlements on the land? _____

19. If yes, please specify

Number of settlements _____

20. Are there any structures on the proposed site now? Yes No

21. Are there any trees on the proposed site? Yes No

22. Will any tree be removed? Yes No

23. If yes, how many? _____

24. Period of construction (start and end dates) _____

25. Is construction work during the night planned? Yes No

26. Is the proposed project located in an ecologically sensitive area? Yes No

Please specify and explain

27. What type of HSE equipment is needed or shall be supplied.

Details and numbers

28. Is there any sensitive receptor near the proposed project?

Yes

No

If yes, write in detail:

29. Are there any reserved forest or protected area within 1,00 m of the proposed site?

Yes



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No

If yes, please describe? _____

30. What is the present land use in the vicinity (roughly a radius of 100 m) of the proposed site?

	Residentia l (Thick, Moderate, Sparse)	Commerci al (Office, Shops, Fuel Stations)	Open Land (Parks, Farmlands, unutilized plots, barrenland)	Industrial	Other
Description					

31. Roughly, how many houses are within a radius of 100 Ft from the boundary wall of the proposed site?

32. What is the total population of the area? _____

33. What proportion of the houses in the area are *pukka*, *semi-pukka*, and *kucha*? _____

What are the main sources of income of the surrounding community?

34. Is there any site of cultural importance (graveyard, shrine, mosque, archeological site) within 100 m of the proposed scheme?

Yes



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No

If yes, please describe? _____

Reporting Officer

Decision of the Director of Concerned Directorate

-sd-

Secretary to Govt. of Khyber Pakhtunkhwa
Climate Change, Forestry, Environment & Wildlife
Department

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Copy for information to;

1. All members of Environmental Protection Council (EPC) Khyber Pakhtunkhwa
2. PS to Secretary Climate Change, Forestry, Environment & Wildlife Department, Khyber Pakhtunkhwa


Muhammad Ishaq
Section Officer (Environment)