



## MINISTRY OF ENVIRONMENT AND NDU

ENVIRONMENTAL GUIDELINE No. 20

### MANUFACTURE OF POLYURETHANE FOAM

#### 1.0 Purpose of guideline

This environmental guideline for the manufacture of polyurethane foam has been prepared by the Ministry of Environment & NDU to ensure that all environmental issues are duly taken into consideration by stakeholders.

#### 2.0 Nature of development

Polyurethane foams have a variety of uses including insulation, acoustic, air conditioning and refrigeration, furniture, cushioning in automotive seats, mattresses and pillows and carpet underlay.

Foams are made by forming gas bubbles in a plastic mixture, with the use of a blowing agent. Foam manufacture can either be a continuous process for making laminate or slabstock or a batch process for making various shapes by cutting or moulding.

The main reaction is between liquid polymers that, when combined with water, produce an exothermic (heat generating) reaction in the presence of catalysts and surfactants. Additives such as flame retardants, volatile organic compounds (blowing agents), simple volatile chemicals such as acetone or methylene chloride, etc are also added to improve the performance and strength of the foam.

#### 3.0 Potential impacts

The major environmental issues associated with the manufacture of polyurethane foam are to noise, solid waste and wastewater generation. The different aspects, impacts and nuisances related to such activities are listed below:

Activity	Aspects	Impacts/ Nuisances
<b>Construction phase</b>		
Site preparation / Construction of buildings (where applicable)	<ul style="list-style-type: none"> <li>- Generation of excavated soil, debris and construction wastes</li> <li>- Use of heavy machinery</li> </ul>	<ul style="list-style-type: none"> <li>- Dumping into barelands and water courses</li> <li>- Noise, mud, dust, traffic</li> </ul>

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		- Visual impacts
<b>Operation phase</b>		
Handling and storage of the chemicals	<ul style="list-style-type: none"> <li>- Emissions from volatile compounds</li> <li>- Improper handling and storage of chemicals</li> </ul>	<ul style="list-style-type: none"> <li>- Impact on air quality and human health</li> <li>- Odour/ irritation</li> <li>- Fire hazards</li> <li>- Spillage of chemicals</li> </ul>
Manufacturing processes ( material preparation , mixing , cutting and curing)	<ul style="list-style-type: none"> <li>- Use of machinery and equipment</li> <li>- Generation of solid wastes and wastewater</li> <li>- Poor housekeeping</li> </ul>	<ul style="list-style-type: none"> <li>- Noise</li> <li>-Land and water pollution</li> <li>- Visual impacts</li> <li>- Odour</li> </ul>
Movement of vehicles	- Inadequate parking , loading and unloading facilities	- Traffic implications

#### 4.0 Siting of activity

The activity shall be located outside residential areas.

#### 5.0 Environmental Conditions

The major environmental issues are **noise, solid waste and wastewater generation** and the following conditions shall be observed:

- (i) All electric motors such as compressors, pumps, and stand-by generator shall be housed in soundproof enclosures to keep noise level within permissible limits as per the Environment Protection (Environmental Standards for Noise) Regulations 1997. The noise exposure limits as per the above regulation are as follows:

Industrial noise		Neighbourhood noise	
7:00 – 21:00	60*dB(A) Leq	7:00 – 18:00	60 dB(A) Leq
21:00 – 7:00	55*dB(A) Leq	18:00 - 21:00	55 dB(A) Leq
		21:00 – 7:00	50 dB(A) Leq

\* A tonal character adjustment of +5 dB(A) should be applied to the measured value where the noise has a definite continuous note such as a whine or hiss.

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- (ii) All solid wastes generated from the activity shall be collected and disposed of.
- (iii) All hazardous wastes shall be disposed of as per the provisions of Environment Protection (Standards for Hazardous Wastes) Regulations 2001.
- (iv) Wastewater shall be collected and disposed of.
- (v) A contingency plan as provided for under section 30 (3)(a) of the Environment Protection Act 2002 shall be prepared and implemented to combat any case of accidental spillage of fuel or chemicals.
- (vi) All chemicals shall be kept in tightly closed containers in store dedicated for this purpose having ventilation.
- (vii) No nuisance by way of noise dust, air pollution shall be caused to the public and surrounding environment during site preparation, infrastructural works and during operation of the activity.
- (viii) The Department of Environment of the Ministry of Environment and NDU shall be informed in writing of the dates of commencement of works on site and operation of the activity for monitoring purposes.

## **6.0 Enforcement**

Under Section 13 of the Environment Protection Act 2002, the enforcing agencies for the different environmental medium or pollutants are as follows:

<b>S. No</b>	<b>Environmental media/ pollutant</b>	<b>Enforcing Agency</b>
1	Noise, odour	Ministry of Health and Quality of Life
2	Effluents	Ministry of Public Utilities
3	Solid wastes and hazardous waste	Ministry of Local Government

The above-mentioned enforcing agencies shall monitor compliance with the conditions falling under their purview.

## **7.0 Offences**

Any person who fails to comply with any regulations/standards referred to in this guideline shall commit an offence and shall:

- (i) on a first conviction, be liable to a fine not exceeding 50, 000 rupees and to imprisonment for a term not exceeding two years.
- (ii) on a second or subsequent conviction, be liable to a fine not exceeding 100,000 rupees and to imprisonment for a term not exceeding 8 years.

**For further information, please contact**  
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