



MINISTRY OF ENVIRONMENT AND NDU

ENVIRONMENTAL GUIDELINE No. 12

MIRROR MANUFACTURE

1.0 Purpose of guideline

This environmental guideline for the manufacture of mirror 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

The material mainly used for mirrors is glass because it can be moulded into various shapes. The base material is coated with a variety of metals such as silver, aluminium, gold and chrome. Scientific grade mirrors are sometimes coated with other materials, like silicon oxides and silicon nitrides.

3.0 Potential impacts

The major environmental issues associated with mirror manufacture are noise, effluent disposal and air emission. The different aspects, impacts and nuisances related to such activities are listed below:

Activity	Aspects	Impacts/ Nuisances
Construction phase		
Site preparation / Construction of buildings <i>(where applicable)</i>	<ul style="list-style-type: none"> - Generation of excavated soil, debris and construction wastes - Use of heavy machinery 	<ul style="list-style-type: none"> -Dumping into barelands, water bodies and drains -Dust, noise and mud -Visual impacts
Operation phase		
Manufacturing processes	<ul style="list-style-type: none"> - Solid wastes generation mainly in the form of broken glasses and mirrors. 	<ul style="list-style-type: none"> - Visual impacts - Human safety

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	<ul style="list-style-type: none">- Wastewater from the process loaded with metals like silver, tin, copper.- Use of machinery and equipment e.g grinders for cutting and shaping of glasses , compressor- Air emissions depending on the fuel utilised for heating the evaporator- Poor housekeeping	<ul style="list-style-type: none">-Risks of contamination of water bodies and groundwater.-Generation of noise-Impact on air quality
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4.0 Siting of the activity

The site shall be located outside residential areas.

5.0 Environmental Considerations / Conditions

The major environmental issues are **noise, effluent disposal, air emissions** and following environmental conditions shall be observed, where applicable:-

- (i) All hazardous wastes, including obsolete stocks and wastes contaminated with chemicals shall be disposed of as per the Environment Protection (Standards for Hazardous wastes) Regulations 2001.
- (ii) All solid wastes generated from the activity shall be collected and disposed of.
- (iii) Wastewaters shall be collected and disposed of.
- (iv) All chemicals shall be kept in a store dedicated for this purpose in tightly closed containers with ventilation.
- (v) Flue and odorous gases shall be channeled through ducts connected to a chimney stack which shall be designed as per good engineering practices.
- (vi) All electric motors such as stand-by generator and air- conditioning devices 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:

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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.

- (vii) All gaseous emissions from the bakery shall be within permissible limits as per the Environment Protection (Standards for Air) Regulations 1998. The stack emissions standards applicable to this undertaking are:

Pollutant	Standard
(i) Smoke	Ringelmann No. 2 or equivalent opacity (not to exceed more than 5 minutes in any period of one hour)
(ii) Solid particles	200 mg/ m ³
(iii) Sulphuric acid mist or sulphur trioxide	120 mg/ m ³ as sulphur trioxide
(iv) Hydrogen sulphide	5 ppm as hydrogen sulphide gas
(v) Nitric acid or oxides of nitrogen	1 000 mg/ m ³ as nitrogen dioxide
(vi) Carbon monoxide	1 000 mg/ m ³ as carbon monoxide

- (viii) 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.
- (ix) 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:

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S. No	Environmental media/ pollutant	Enforcing Agency
1	Noise, odour	Ministry of Health and Quality of Life
2	Effluents	Ministry of Public Utilities
3	Solid wastes, hazardous wastes	Ministry of Local Government
4	Air pollution	Ministry of Environment

The above-mentioned enforcing agencies shall monitor compliance to 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

Information Counter,
Department of Environment,
Ground Floor Ken Lee Tower,
1, St Georges Street
Port-Louis
Tel: 203 6200-203 6210

Website : <http://environment.gov.mu>

Email : menv@mail.gov.mu