

## **GUIDELINES FOR CARRYING OUT CHRYSOTILE ASBESTOS MINING**

Notwithstanding any Rule contained under Mineral Conservation & Development Rules, 1988, the following guidelines are issued to the mine owners of Chrysotile Asbestos Mines, for pollution control and scientific development of these mines :

- Every mine owner, who undertakes the Chrysotile Asbestos mining shall take adequate steps during mining, material handling and transportation and processing of asbestos ore so as to eliminate or minimize the asbestos dust concentration in the working environment.
- Procedure for sampling should be adopted as per IS 11450: 2006/(C)BIS 2006: Indian Standard Method For Determination Of Airborne Asbestos Fibre Concentration In Work Environment By Light Microscopy (Membrane Filter Method).
- No person shall be allowed to enter or remain in any work place which contains airborne asbestos dust at any time, exceeding the TLV (threshold limit value) of 1 fibre per cc, perceptible through standard monitoring procedures. IS 12082 (Part 1) : 2006 / (c)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part-1 Mining Of Asbestos Ore may be strictly followed.
- No person shall enter or remain in any place which contains airborne asbestos dust at any time exceeding the limit of 1 fibre per cc in the working atmosphere, as observed in standard monitoring, unless such person is wearing approved type respiratory equipment to prevent the inhalation of such dust.
- For the above purpose, air quality monitoring shall be done for every quarter at all the mine working faces, transport roadways, milling plants and the tailing and waste dumps, sampling of which shall be done through an approved apparatus and analysed as per standard methods. The quarterly reports on such monitoring shall be submitted within a fortnight of the previous quarter to the respective Regional Controller of Mines and Controller of Mines (Zonal Office of Indian Bureau of Mines).
- Dust generated by drilling operations shall be controlled by either wet drilling or by employing approved extraction equipment mounted on the drill.

- Dust emission from blasting shall be minimized by wetting with water immediately before the blast and multiple small blasts rather than one large blast, should be practiced.
- To reduce throw of the dust, control blasting techniques with proper spacing burden and stemming along with the delay elements and with deck loading or Air Decking, wherever possible, shall be adopted.
- In underground mines, to reduce damage to fibre during the drilling and blasting operation and, thus, releasing airborne dust, wherever possible, the blasting face should be provided with an initial free face or pre-splitting with dummy holes, within the non-asbestos mineralized zone. After this free face is developed, blasting within the asbestos mineralized zone shall be carried out, as far as possible, with low-density explosives.
- All roadways shall be regularly watered and wetted to reduce the creation of airborne asbestos dust.
- The transport trucks used for transport of asbestos ore or its tailings shall never be overloaded and should be properly wetted and completely covered with suitable means.
- For the underground mines, a well designed ventilation system shall be provided and operated throughout the working of the mine as also during the blasting time, as per standard prescribed in MMR, 1961. Persons should not be allowed to be inside the mine while there is a stoppage of ventilation system. An uninterrupted power supply should be ensured for the ventilation fan.
- The exhaust air coming out from the underground workings, through the Evasee fitted on the surface, should be allowed to pass through wet scrubbers, before the air is released to the outside atmosphere.
- The effluent water released from the mine as well as from the processing plants should be properly treated to remove the sediments before their final discharge.
- The asbestos milling operations should be mechanized, using mechanised transport equipment like elevators, screw conveyors, belt conveyors etc., and for crushing and liberation of asbestos fibers using mechanical equipments like Crushers, Fibrizers, Disintegrators, Pulverizers, Edge-runners etc., and for separation of fibers using mechanized equipment like Vibro-screens, Gyro-centric screen, Trammels Cyclones etc. IS 12082 (Part 2) : 2006 / (C) BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part 2 Milling Of Asbestos Ore and IS 11767 : 2005 / (C) BIS 2005: Indian Standard Recommendations For Cleaning Of Premises and Plants Using Asbestos Fibers may be strictly adhered to.



- Material transfer from one operation to the other including Bagging shall be pneumatically conveyed through ducts. The transfer points shall be completely enclosed and connected to dust extraction system which shall be pneumatically conveyed and discharged in water precipitator tanks.
- All the ore processing operations should be in closed circuit, with proper enclosures like exhaust hoods, so as not to allow the dust generated to escape in the outside atmosphere. These enclosures shall be cleaned periodically with water and compressed air emulsions and such discharge water shall be disposed off properly.
- Provisions shall be made at all dust generating points of the mill to collect the dust laden air, which shall be filtered through high efficiency bag filters.
- The external walls of the ore processing plant shall be provided with exhaust fans, for pneumatically conveying the fine dust particles to water precipitators for reduction of dust released from various operations / units.
- The tailings discharged from the screen shall be transported outside the plant by conveyor, preferably by screw conveyors. These tailing dumps as well as the waste dumps shall be suitably rehabilitated with an inert cover overlaid by sufficiently thick soil cover, for developing suitable vegetation.
- To prevent the spread of air borne fibre dust in the outside environment, thick green barriers shall be developed, surrounding the mine area, processing plant and the waste / tailing dumps.
- Asbestos containing residue is covered under the Hazardous Waste (Management and Handling) Rules, 1989. Accordingly, hazardous waste may be transported, treated and disposed of as per Hazardous Waste (Management and Handling) Rules, 1989.

**List of referred Indian Standards:**

IS 12082 (Part 1) : 2006 / (c)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part-1 Mining Of Asbestos Ore (First Revision)

IS 12082 (Part 2) : 2006 / (C)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part 2 Milling Of Asbestos Ore (First Revision)

IS 11450: 2006 / (C)BIS 2006: Indian Standard Method For Determination Of Airborne Asbestos Fiber Concentration In Work Environment By Light Microscopy (Membrane Filter Method) (First Revision)

IS 11767 : 2005 / (C)BIS 2005: Indian Standard Recommendations for Cleaning of Premises and Plants Using Asbestos Fibers (First Revision)

Hazardous Waste (Management and Handling) Rules, 1989.

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**GUIDELINES FOR CARRYING OUT THE AMPHIBOLE GROUPS OF ASBESTOS  
MINING**

Notwithstanding any Rule contained under Mineral Conservation & Development Rules, 1988, the following guidelines are issued to the mine owners of Amphibole Asbestos Mines, for pollution control and scientific development of these mines :

- Every mine owner, who undertakes the Amphibole Asbestos mining shall take adequate steps during mining, material handling and transport and processing of asbestos ore so as to eliminate or minimize the asbestos dust concentration in the working environment.
- Procedure for sampling should be adopted as per IS 11450: 2006/(C)BIS 2006: Indian Standard Method For Determination Of Airborne Asbestos Fibre Concentration In Work Environment By Light Microscopy (Membrane Filter Method) (First Revision).
- No person shall be allowed to enter or remain in any work place which contains airborne asbestos dust at any time, exceeding the TLV (threshold limit value) of 1 fibre per cc, perceptible through standard monitoring procedures. IS 12082 (Part 1) : 2006 / (c)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part-1 Mining Of Asbestos Ore (First Revision) may be strictly followed.
- No person shall enter or remain in any place which contains airborne asbestos dust at any time exceeding the limit of 1 fibre per cc in the working atmosphere, as observed in standard monitoring, unless such person is wearing approved type respiratory equipment to prevent the inhalation of such dust.
- For the above purpose, air quality monitoring shall be done for every quarter at all the mine working faces, transport roadways, milling plants and the tailing and waste dumps, sampling of which shall be done through an approved apparatus and analysed as per standard methods. The quarterly reports on such monitoring shall be submitted within a fortnight of the previous quarter to the respective Regional Controller of Mines and Controller of Mines (Zonal Office of Indian Bureau of Mines).
- Dust generated by drilling operations shall be controlled by either wet drilling or by employing approved extraction equipment mounted on the drill.



- Dust emission from blasting shall be minimized by wetting of the face with water immediately before the blast and multiple small blasts rather than one large blast, should be practiced.
- To reduce throw of the dust, control blasting techniques with proper spacing burden and stemming along with the delay elements and with deck loading or Air Decking, wherever possible, shall be adopted.
- For the underground mines, a well designed ventilation system shall be provided and operated throughout the working of the mine and also during the blasting time, as per standard prescribed in MMR,1961. Persons should not be allowed to be inside the mine while there is a stoppage of ventilation system. An uninterrupted power supply should be ensured to the ventilation fan.
- The exhaust air coming out from the underground workings, through the Evasee fitted on the surface, should be allowed to pass through wet scrubbers, before the air is released to the outside atmosphere.
- The effluent water released from the mine as well as from the processing plants should be properly treated to remove the sediments before their final discharge.
- The asbestos milling operations should be mechanized, using mechanised transport equipment like elevators, screw conveyors, belt conveyors etc., and for crushing and liberation of asbestos fibers using mechanical equipments like Crushers, Fibrizers, Disintegrators, Pulverizes, Edge-runners etc., and for separation of fibers using mechanized equipment like Vibro-screens, Gyro-centric screen, Trammels Cyclones etc. IS 12082 (Part 2) : 2006 / (C)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part 2 Milling Of Asbestos Ore (First Revision) and IS 11767 : 2005 / (C)BIS 2005: Indian Standard Recommendations For Cleaning Of Premises And Plants Using Asbestos Fibers(First Revision) may be strictly adhered to.
- Material transfer from one operation to the other including Bagging shall be pneumatically conveyed through ducts. The transfer points shall be completely enclosed and connected to dust extraction system which shall be pneumatically conveyed and discharged in water precipitator tanks.
- All the ore processing operations should be in closed circuit, with proper enclosures like exhaust hoods, so as not to allow the dust generated to escape in the outside atmosphere. These enclosures shall be cleaned periodically with water and compressed air emulsions and such discharge water shall be disposed of properly.

- Provisions shall be made at all dust generating points of the mill to collect the dust laden air, which shall be filtered through high efficiency bag filters.
- The external walls of the ore processing plant shall be provided with exhaust fans, for pneumatically conveying the fine dust particles to water precipitators for humidification and thus, reduction of dust released from various operations / units.
- The tailings discharged from the screen shall be transported outside the plant by conveyor, preferably by screw conveyors. These tailing dumps as well as the waste dumps shall be suitably rehabilitated with an inert cover over laid by sufficiently thick soil cover, for developing suitable vegetation.
- To prevent the spread of air borne fibre dust to outside environment, thick green barriers shall be developed, surrounding the mine area, processing plant and the waste / tailing dumps.
- Asbestos containing residue is covered under the Hazardous Waste (Management and Handling) Rules, 1989. Accordingly, hazardous waste may be transported, treated and disposed of as per Hazardous Waste (Management and Handling) Rules, 1989.

**List of referred Indian Standards:**

IS 12082 (Part 1) : 2006 / (c)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part-1 Mining Of Asbestos Ore (First Revision)

IS 12082 (Part 2) : 2006 / (C)BIS 2006: Indian Standard Control Of Asbestos Emission – Recommendations Part 2 Milling Of Asbestos Ore (First Revision)

IS 11450: 2006 / (C)BIS 2006: Indian Standard Method For Determination Of Airborne Asbestos Fiber Concentration In Work Environment By Light Microscopy (Membrane Filter Method) (First Revision)

IS 11767 : 2005 / (C)BIS 2005: Indian Standard Recommendations for Cleaning of Premises and Plants Using Asbestos Fibers (First Revision)

Hazardous Waste (Management and Handling) Rules, 1989.

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