

SUMMARY

OCCUPATIONAL EXPOSURE TO ACRYLONITRILE (VINYL CYANIDE) 29 CFR 1910

Item 1910.1045 Acrylonitrile

(a) Scope and application

1. This section applies to all occupational exposures to acrylonitrile, except as provided in paragraphs (a)(2) and (a)(3) of this section.
2. This section does not apply to exposures which result solely from the processing, use and handling of the following:
 - (i) ABS resins, SAN resins, nitrile barrier resins, solid nitrile elastomers and acrylic and modacrylic fibers.
 - (ii) Materials made from and/or containing AN for which objective data is reasonably relied upon to demonstrate that the material is not capable of releasing AN in airborne concentrations in excess of 1 ppm as an eight (8) hour time-weighted average, under the expected conditions of processing, use and handling which will cause the greatest possible release and
 - (iii) Solids materials made from and/or containing AN which will not be heated above 170° F during handling, use or processing.

(b) Definitions:

"Action level" means a concentration of AN of 1 ppm as an eight (8) hour time-weighted average.

"Decontamination" means treatment of materials and surfaces by water washdown, ventilation or other means to assure that the materials will not expose employees to airborne concentrations of AN above 1 ppm.

"Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment, which results in an unexpected massive release of AN. Exceeding the fifteen minute ceiling value of acrylonitrile in the work-space air does not necessarily mean an emergency per se.

"Liquid AN" means AN monomer in liquid form, and liquid or semi-liquid polymer intermediates, including slurries, suspensions, emulsions and solutions produced during the polymerization of AN.

(c) Permissible exposure limits

1. Inhalation. The employer shall assure that no employee is exposed to an airborne concentration of acrylonitrile in excess of two (2) parts per million as an eight (8) hour time-weighted average.

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Ceiling limit - The employer shall assure that no employee is exposed to an airborne concentration of acrylonitrile in excess of ten (10) ppm as averaged over any fifteen minute period during the working day.

2. Dermal and eye exposure. The employer shall assure that no employee is exposed to skin contact or eye contact with liquid acrylonitrile.

(d) Notification and regulated areas and emergencies

1. Regulated areas. Within thirty (30) days following the establishment of a regulated area pursuant to paragraph (f) of this section, the employer shall report the necessary information to the OSHA Area Office.
2. Emergencies. Emergencies and the facts obtainable at that time, shall be reported within 72 hours of the initial occurrence to the OSHA Area Office.

(e) Exposure monitoring

1. General. Determination of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to AN over an eight-hour period.
2. Initial monitoring. Each employer who has a place of employment in which AN is present shall monitor such workplace and work operation to accurately determine the airborne concentrations of AN to which employees may be exposed.
3. Frequency. If the monitoring required by this section reveals employee exposure to be below the action level, the employer may discontinue monitoring for that employee. If the monitoring required reveals employee exposures above the action level but below the permissible exposure limits, the employer shall repeat such monitoring for each employee at least quarterly. If the monitoring reveals employee exposure in excess of the permissible exposure limits, the employer shall repeat these determinations for each employee at least monthly.
4. Additional monitoring. Whenever the employer has any reason to suspect a change which may result in new or additional exposures to AN, additional monitoring shall be conducted.
5. Employee notification. Within five working days after the receipt of the results of monitoring the employer shall notify each employee in writing of the results which represent that employee's exposure.

(f) Regulated Areas

The employer shall establish regulated areas where AN concentrations are in excess of the permissible exposure limits.

(g) Methods of Compliance

1. Engineering and work practice controls. By November 2, 1980 the employer shall institute engineering and work practice controls to reduce and maintain employee exposures to AN, to or below the permissible exposure limits, except to the extent that the employer establishes that such controls are not feasible.
2. Compliance program. The employer shall establish and implement a written program to reduce employee exposures to or below the permissible exposure limits solely by means of engineering and work practice controls. Written plans for these compliance programs shall include at least the description of each operation and process resulting in employee exposure to AN above the permissible limits and outline the nature of the engineering controls and work practices to be applied, a report of the technology considered in meeting the permissible exposure limits, a schedule of the implementation of engineering and work practice controls for the operation or process and any other relevant information.

(h) Respiratory protection

1. General. The employer shall assure that respirators are used where required to reduce employee exposure to within the permissible exposure limits. Respirators shall be used in the following circumstances:
 - (i) During the time necessary to install and implement feasible engineering and work practice controls.
 - (ii) In work operations, such as maintenance and repair activities in which the employer establishes that engineering and work practice controls are not feasible.
 - (iii) In work situations where feasible, engineering and work practice controls are not yet sufficient to reduce exposures to or below the permissible exposure limits.
 - (iv) And in emergencies.
2. Respirator selection. For acrylonitrile concentration less than or equal to 100 ppm, the respirator type shall be a full face piece respirator with an organic vapor cartridge, a supplied air respirator with full face piece or a self-contained breathing apparatus with full face piece. For concentrations less than or equal to 4,000 ppm a supplied air respirator operated in the positive pressure mode with full face piece, helmet, suit or hood. For concentrations greater than 4000 ppm or for unknown concentrations the respirator type

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2. shall be supplied air with auxiliary self-contained breathing apparatus having full face piece or a self-contained breathing apparatus with full face piece in the positive pressure mode. For escape purposes, any organic vapor respirator or self-contained breathing apparatus is acceptable.

(i) Emergency Situations

1. Written plans. A written plan for emergency situations shall be developed for each workplace where liquid acrylonitrile is present and appropriate portions of this plan shall be implemented in the event of emergency.
2. Alerting employees. Where there is the possibility of employee exposure to AN in excess of the ceiling limit, a general alarm shall be installed and used to promptly alert employees of such occurrence.

(j) Protective Clothing and Equipment

Provision and use. Where eye or skin contact with liquid acrylonitrile may occur, the employer shall assure that employees wear impermeable protective clothing or other equipment to protect any area of the body which may come in contact with liquid acrylonitrile.

(k) Housekeeping

All surfaces shall be maintained free of visible accumulations of liquid acrylonitrile. In operations involving liquid acrylonitrile the employer shall institute a program for detecting leaks and spills of liquid acrylonitrile, including regular visual inspections. Where spills of liquid acrylonitrile are detected, the employer shall assure that all surfaces contacted by liquid acrylonitrile are decontaminated.

(l) Waste Disposal

Acrylonitrile waste, scrap, debris, bags, containers, or equipment shall be decontaminated before being incorporated in the general waste disposal system.

(m) Hygiene Facilities and Practices

Where employees are exposed to airborne concentrations of acrylonitrile above the permissible exposure limits, or where employees are required to wear protective clothing or equipment, the facilities provided shall include clean change rooms and shower facilities for use of those employees. The employer shall assure that the employees wearing protective clothing or equipment for protection from skin contact with liquid acrylonitrile shall shower at the end of the work shift. The employer shall also assure that in the event of skin or eye exposure to liquid acrylonitrile, the affected employee shall shower immediately to minimize the danger of skin absorption.

(n) Medical Surveillance

The employer shall institute a program of medical surveillance each employee who is or will be exposed to acrylonitrile at or above the action level. The employer shall provide each such employee with an opportunity for medical examinations and tests in accordance with this regulation. The employer shall obtain a written opinion from the examining physician which shall include the results of the medical examination and tests performed, the physician's opinion as to whether the employee has any detected medical condition which would place the employee at an increased risk of material impairment of the employee's health and exposure to acrylonitrile, any recommended limitations upon the employee's exposure to acrylonitrile and a statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment. The employer shall provide a copy of the written opinion to the affected employee.

(o) Employee Information and Training

By January 2, 1979, the employer shall institute a training program for and assure participation of all employees exposed to acrylonitrile above the action level, all employees whose exposures are maintained below the action level by engineering and work practice controls, and all employees subject to potential skin or eye contact with liquid acrylonitrile. Training shall include information contained in Appendixes A and B, the quantity, location, manner of use, release or storage of acrylonitrile and the specific nature of operations which could result in exposure to acrylonitrile as well as any necessary protective steps. Training shall also provide information on the purpose, proper use and limitation of respirators and protective clothing. Other training items include the purpose and description of the medical surveillance program, the emergency procedures, engineering and work practice controls, their functions and employee's relationship to these controls and a review of this standard.

(p) Signs and Labels

The employer shall post signs to clearly indicate all workplaces where AN concentrations exceed the permissible exposure limits. These signs shall bear the following legend:

DANGER
ACRYLONITRILE (AN)
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS MAY BE REQUIRED

The employer shall assure that precautionary labels are affixed to all containers of liquid acrylonitrile and acrylonitrile-based materials not exempted. The labels shall bear the following legend:

DANGER
ACRYLONITRILE (AN)
CANCER HAZARD

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(q) Recordkeeping

- (1) Objective data for exempted operations. Where processing, use and handling of materials made from or containing acrylonitrile are exempted, the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.
- (2) Exposure monitoring. The employer shall establish and maintain an accurate record of all monitoring required by this regulation. The employer shall maintain this record for at least forty (40) years or the duration of employment plus twenty (20) years, whichever is longer.
- (3) Medical surveillance. The employer shall establish and maintain an accurate record of each employee subject to medical surveillance as required of this regulation. This record shall include a copy of the physician's written opinions, any employee medical complaints related to exposure day in, a copy of the information provided to the physician, a copy of the employee's medical and work history.
- (4) Availability. The employer shall make all records required to be maintained for this regulation available on request to the Assistant Secretary and the Director for examination and copying. The employer shall make records required available on request for the examination copying to the affected employees, former employees, or their designated representative.

(r) Observation and Monitoring

The employer shall provide affected employees, or their designated representatives, an opportunity to observe any monitoring of employee exposure to acrylonitrile conducted pursuant to this regulation. Monitoring and medical surveillance conducted since January 17, 1978, under the provisions of the emergency temporary standard may be relied upon by the employer to meet the initial monitoring and initial medical surveillance requirements of this regulation. Training programs must be implemented by January 2, 1979. Engineering and work practice controls required by this regulation shall be implemented no later than November 2, 1980.

(t) Appendixes

The information contained in the appendixes is not intended, by itself, to create any additional obligations not otherwise imposed, or to detract from any obligation.

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