

CHAPTER 7. REGULATIONS AND GUIDELINES

Pertinent international and national regulations, advisories, and guidelines regarding acrylonitrile in air, water, and other media are summarized in Table 7-1. This table is not an exhaustive list, and current regulations should be verified by the appropriate regulatory agency.

ATSDR develops MRLs, which are substance-specific guidelines intended to serve as screening levels by ATSDR health assessors and other responders to identify contaminants and potential health effects that may be of concern at hazardous waste sites. See Section 1.3 and Appendix A for detailed information on the MRLs for acrylonitrile.

Table 7-1. Regulations and Guidelines Applicable to Acrylonitrile

Agency	Description	Information	Reference
Air			
EPA	RfC	2×10^{-3} mg/m ³ (0.001 ppm)	IRIS 2002
WHO	Air quality guidelines for Europe Guideline	Treated as if a human carcinogen, no safe level can be recommended	WHO 2000
	Lifetime unit risk (at air concentration of 1 µg/m ³)	2×10^{-5}	
Water & Food			
EPA	Drinking water standards and health advisories		EPA 2018a
	10 ⁻⁴ Cancer risk	0.006 mg/L	
	National primary drinking water regulations	Not listed	EPA 2023
	RfD	Not evaluated	IRIS 2002
WHO	Drinking water quality guidelines	Not listed	WHO 2022
FDA	Substances added to food ^a	Acrylonitrile monomer not listed	FDA 2024
Cancer			
HHS	Carcinogenicity classification	Reasonably anticipated to be a human carcinogen	NTP 2021
EPA	Carcinogenicity classification	B1 ^b	IRIS 2002
	Inhalation unit risk	6.8×10^{-5} per µg/m ³	
	Oral slope factor	5.4×10^{-1} per mg/kg/day	
IARC	Carcinogenicity classification	Group 1 ^c	Stayner et al. 2024

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Agency	Description	Information	Reference
Occupational			
OSHA	PEL (8-hour TWA) for general industry, shipyards, and construction	2 ppm	OSHA 2023a , 2023b , 2023c
	Ceiling limit (15-minute) for general industry, shipyards, and construction	10 ppm	
	Dermal and eye exposure for general industry, shipyards, and construction	No skin or eye contact with liquid acrylonitrile	
NIOSH	REL (up to 10-hour TWA)	1 ppm ^{d,e}	NIOSH 2019
	Ceiling limit (15-minute)	10 ppm	
	IDLH	60 ppm	NIOSH 2016
Emergency Criteria			
EPA	AEGLs-air		EPA 2018b
	AEGL 1 ^f		
	10-minute	1.5 ppm	
	30-minute	1.5 ppm	
	60-minute	NR ^g	
	4-hour	NR ^g	
	8-hour	NR ^g	
	AEGL 2 ^f		
	10-minute	8.6 ppm	
	30-minute	3.2 ppm	
	60-minute	1.7 ppm	
	4-hour	0.48 ppm	
	8-hour	0.26 ppm	
	AEGL 3 ^f		
	10-minute	130 ppm	
30-minute	50 ppm		
60-minute	28 ppm		
4-hour	9.7 ppm		
8-hour	5.2 ppm		

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Agency	Description	Information	Reference
DOE	PACs-air		DOE 2024a
	PAC-1 ^h	0.15 ppm	
	PAC-2 ^h	1.7 ppm	
	PAC-3 ^h	28 ppm	

^aThe Substances Added to Food inventory replaces EAFUS and contains the following types of ingredients: food and color additives listed in FDA regulations, flavoring substances evaluated by FEMA or JECFA, GRAS substances listed in FDA regulations, substances approved for specific uses in food prior to September 6, 1958, substances that are listed in FDA regulations as prohibited from use in food, delisted color additives, and some substances "no longer FEMA GRAS".

^bGroup B1: probable human carcinogen, based on limited evidence of carcinogenicity in humans.

^cGroup 1: carcinogenic to humans.

^dSkin designation.

^ePotential occupational carcinogen.

^fDefinitions of AEGL terminology are available from U.S. Environmental Protection Agency (EPA 2018c).

^gNR: Not recommended due to insufficient data.

^hDefinitions of PAC terminology are available from U.S. Department of Energy (DOE 2024b).

AEGL = acute exposure guideline levels; DOE = Department of Energy; EAFUS = Everything Added to Food in the United States; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; FEMA = Flavor and Extract Manufacturers Association of the United States; GRAS = generally recognized as safe; HHS = Department of Health and Human Services; IARC = International Agency for Research on Cancer; IDLH = immediately dangerous to life or health; IRIS = Integrated Risk Information System; JECFA = Joint FAO/WHO Expert Committee on Food Additives; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PAC = protective action criteria; PEL = permissible exposure limit; REL = recommended exposure limit; RfC = inhalation reference concentration; RfD = oral reference dose; TLV = threshold limit value; TWA = time-weighted average; WHO = World Health Organization