

KNOWN CARCINOGENS* IN THE FIREFIGHTING ENVIRONMENT



CARCINOGEN	DEFINITION	CANCER SITES
Arsenic	Heavy metal commonly found in smoke. Used to produce chromated copper arsenate, a wood preservative	Bile duct, Bladder, Kidney, Liver, Lung, Prostate, Skin
Asbestos	Naturally occurring minerals used in fireproofing and insulation. Primarily in building and building materials before 1989.	Colon, Larynx, Lung, Mesothelium, Ovary, Pharynx, Rectum, Stomach
Ash/ Soot	Incomplete burning of organic matter. Typically a black or grey powdery substance	Bladder, Lung, Skin
Benzene	Found in crude oil, gasoline, motor vehicle exhaust, tobacco smoke, and wood smoke. Used to make plastics and is a primary component of PVC combustion	Leukemia, Lung, Non-Hodgkin lymphoma, Multiple myeloma
1,3 Butadiene	Found in wildland fires, rubber, burning wood, and cigarette smoke	Leukemia, Lymphoma, Multiple myeloma
Cadmium	A type of metal used in the production of batteries, plastics, and other industrial processes. Can also be found in diesel exhaust	Kidney, Lung, Prostate
Diesel Exhaust	A complex mixture of both particulate matter and gaseous substances, polyaromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs)	Bladder, Lung
Dioxin (2,3,7,8-TCDD)	Formed during combustion processes: waster incineration, fuels (e.g., wood, coal, oil), plastic materials containing polybrominated diphenyl ethers (PBDEs)	Breast, Lung, Non-Hodgkin lymphoma, Soft-tissue, Stomach
Flame Retardants	Various chemicals used to prevent burning or slow fire spread. Added to consumer products, including upholstery, furniture, and mattresses	Breast, Non-Hodgkin lymphoma, Skin, Soft-tissue, Thyroid
Formaldehyde	Organic compound used in resins, adhesives for pressed wood products, particle board, furniture, preservation in some medical labs, and consumer products	Nasal cavity and paranasal sinus, Leukemia, Pharynx
Polychlorinated Biphenyls (PCBs)	Used as a flame retardant in electronic equipment, insulation, oil-based paint, caulking, fluorescent light bulbs, plastics, and flood finish	Breast, Non-Hodgkin lymphoma, Skin
Per-and Poly-fluoroalkyl Substances (PFAS)	A group of chemicals used to make coatings and products resistant to heat, oil, stains, grease, and water. Is also in some firefighting foams (AFFF) and turnout gear	Breast, Kidney, Non-Hodgkin lymphoma, Prostate, Testicular
Polycyclic Aromatic Hydrocarbons (PAHs)	A group of >100 chemicals formed during incomplete burning of coal, oil, gas, garbage, and other organic substances like tobacco. Encountered frequently on fire grounds during fires, overhaul, and cleaning of equipment, clothing, and skin	Bladder, Lung, Skin
Trichloroethylene	Used mainly as a solvent to remove grease from metal parts but is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers	Bile duct, Kidney, Liver, Non-Hodgkin lymphoma

This list is for IARC Group 1 Carcinogenic to Humans only. There are many by-products of combustion and chemicals that fire fighters are exposed to listed as Group 2A Probably Carcinogenic to Humans and Group 2B Possibly Carcinogenic to Humans.

*Identified by the International Agency for Research on Cancer (IARC): Monographs Volumes 1-134a the authoritative agency on cancer causation