

Appendix D: Carboxyhemoglobin Levels Present in CO Fatalities

Carboxyhemoglobin (COHb) is a complex of carbon monoxide and hemoglobin that forms in red blood cells when carbon monoxide is inhaled. COHb poisoning can be fatal in large doses because it hinders delivery of oxygen to the body. COHb data are helpful in estimating the concentration of CO in the product exhaust and the lethality of the product, which can affect the speed of onset of harm. This information may be used by CPSC staff to assist in determining the best way to address the CO hazard presented by generators and other EDTs.

In healthy adults, a COHb level of 40 to 50 percent in the blood approximately correlates with symptoms of confusion, unconsciousness, coma, and possible death; a level of 50 to 70 percent approximately correlates with symptoms of coma, brain damage, seizure, and death; and a level greater than 70 percent is typically fatal.⁵ COHb levels were available for 461 of the 872 fatalities (53% of the CO fatalities). Table D-1 shows the frequency of reports by COHb level categories. Percentages in the table are the category proportions of reported COHb levels. Eighty-four percent (387 of the 461) of fatalities had reported COHb levels of 50 percent or greater.

Table D-1: Carboxyhemoglobin Levels Associated with Engine-Driven Tools Non-Fire CO Poisoning Deaths, 2012–2022¹

COHb Level	All Engine-Driven Tools (EDTs)		Generators		Other Engine-Driven Tools (OEDTs)	
Total	872	-	789	-	83	-
Reported Levels	461	100%	419	100%	42	100%
Less than 30%	21	5%	21	5%	0	0%
30–39.9%	14	3%	12	3%	2	5%
40–49.9%	39	8%	38	9%	1	2%
50–59.9%	70	15%	65	16%	5	12%
60–69.9%	155	34%	141	34%	14	33%
70–79.9%	122	26%	105	25%	17	40%
80–89.9%	35	8%	32	8%	3	7%
90–99.9%	5	1%	5	1%	0	0%
Not reported²	411	-	370	-	41	-

⁵ Inkster S.E. *Health hazard assessment of CO poisoning associated with emissions from a portable, 5.5 Kilowatt, gasoline-powered generator*. Washington, D.C.: U.S. Consumer Product Safety Commission. 2004.

