

Storage of wood pellets: a little-known cause of carbon monoxide poisoning



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Wood pellets are small granules used as a heating fuel. When stored, they can naturally emit carbon monoxide, without combustion, causing poisoning that is sometimes fatal. It is important to be aware of this risk, even though it is rare. Pellets must be kept in a storage room separate from living areas and with adequate ventilation.

Carbon monoxide (CO) is responsible for cases of poisoning that are sometimes fatal. It is odourless and colourless, making it undetectable. In the most serious cases, it can lead to coma and convulsions accompanied by respiratory distress at concentrations above 800 ppm, with death occurring rapidly above 1900 ppm¹. It is most often produced by a source of incomplete combustion, such as an electricity generator in an enclosed space or a boiler that has not been properly serviced. One less common scenario deserves to be brought to the public's attention: the storage of pellets.

These compressed wood pellets are used as a heating fuel for boilers or stoves. Ordered in large quantities (up to several tonnes), they are then kept loose in a silo or in sacks on pallets in a storage room. During this storage period, the pellets may emit CO without combustion, due to self-heating resulting from the natural oxidation of the fatty acids in the wood. This CO off-gassing decreases over time but increases with temperature: emissions at 15°C can already exceed several hundred ppm and be 10 to 15 times higher at 40°C. Some tree species such as pine and fir emit greater amounts, whilst others such as spruce emit less². In such circumstances, the CO emitted by the pellets can build up in the storage room, particularly if it is poorly ventilated, and lead to poisoning.

In 2025, in France, the fire service attended to an 87-year-old man who had been poisoned under these circumstances³. The source of the CO was a four-tonne stockpile of pellets stored in the basement of his house. As this storage area was neither ventilated nor separated from the rest of the house, the emitted CO had accumulated and spread into the adjoining living areas. During their operation, the fire fighters measured a CO concentration of between 700 and 1000 ppm in this storage area. They then prohibited all access to the property until the stock of pellets had been removed by a specialist company. The patient was admitted to hospital and his condition progressed favourably. In several European countries, serious accidents, including some fatalities (which nevertheless remain rare), have been reported among workers involved in the manufacture, transport or storage of pellets. To prevent such poisoning cases, training courses and safety recommendations for these professionals have been introduced by the companies

1. https://vigilanses.anses.fr/sites/default/files/VigilAnses_N2_Carbonmonoxide.pdf

2. <https://www.anses.fr/en/content/wood-heating-stepping-measures-reduce-air-pollutant-emissions>

3. <https://pnrs.ensosp.fr/Default/doc/SYRACUSE/97169/partage-d-experience-du-sdis-du-haut-rhin-intoxication-au-monoxyde-de-carbone-par-stockage-de-granul>

marketing the pellets or by industry associations, including in France⁴.

However, these poisonings also affect private individuals who store pellets at home and can, in some cases, be fatal. In Switzerland, a pregnant woman died in the pellet storage room of her home. The CO concentrations measured in this storage area were 7500 ppm, only falling to 2000 ppm after two hours of ventilation⁵.

People who use wood pellets as a heating fuel should be aware of this risk, even though it is rare. The pellets must be stored in a well-ventilated room that is completely separate from the rest of the living areas. In the event of any doubts about the safety or compliance of your pellet storage area, you should contact the stove installer or the pellet supplier. Some departmental fire and rescue services (SDISs) recommend installing a CO detector near this storage area.

Carbon monoxide poisoning should be suspected if a person, or indeed several people in the same location simultaneously, experience the sudden onset of headaches, nausea and dizziness. It is then essential to air living areas, evacuate the premises and call the French emergency services: 15 (ambulance), 18 (fire service), 112 (European emergency number) or 114 for the hearing impaired, or call a poison control centre on +33 (0)1 45 42 59 59 (emergency number available 24/7).



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4. <https://www.inrs.fr/media.html?refINRS=DC%2014>

5. <https://doi.org/10.1093/annhyg/mes047>