

Brief: Novec 649/1230 environmental and occupational safety aspects

- This substance is not classified as hazardous according to the MSDS (US and EC) [1]. The European MSDS is in accordance with the REACH Regulation 1907/2006 and its modifications. EU hazard classification: *Chronic aquatic toxicity*.
- 3M Novec fluids are environment friendly. They have a zero ODP and very low GWP (~1 for Novec 649 and ~300 for Novec 7100) [2]
- The fluid is intended for use in closed occupier areas, is non-toxic with NOAEL > 10% v/v. Good workspace safety and industrial hygiene practices should be followed when handling the fluid. [3]
- The fluid will act as a simple asphyxiant if allowed to accumulate in high concentrations.
- Being very volatile (evaporates 50 times faster than water at a room T) the fluid will rapidly transform to gas in cases of small leaks into air, especially through orifices under over-pressure.
- When a large amount of this fluid is placed in a pool together with liquid water, it will not evaporate because the water phase will be floating on top of the Novec liquid phase having the density of ~1.6 g/cm³ at a room T). The two phases will practically not mix, but water will (very slowly without stirring!) develop some acidity due to PFPrA formation at the boundary between the two fluids. Water will become weakly contaminated with PFPrA, the compound regarded as detrimental, though widely distributed in the environment.¹
- The slow development in the acidity of the water should be the primary concern. Essentially the chemical has a harmful effect on the flora and fauna found in a river or watercourse. This should be the main concern.
- The risk analysis - in addition to formal characteristics and control measures with regards to handling, storage, system operation and maintenance (e.g. leak detection) – should address the effects of accidental releases [4]
 - Behaviour in case of leakage in the cooling system (i.e. gaseous or liquid phase, leak rates, etc.);
 - Expected reaction with water, effluents and reaction with materials (excluding radiation issues).

References

1. 3M Novec 1230 [Approvals](#); 3M 3M™ Novec™ 1230 Fire Protection Fluid [FK-5-1-12], [Safety Data Sheet](#); Novec 649 [MSDS](#)
2. 3M Novec 1230 Environmental Properties, [3M Technical Brief](#)
3. 3M Novec 1230 Safety Assessment, [3M Technical Brief](#)
4. D. Rio, Aspects of the environmental risk analysis for the Novec fluid to be used as PFC-alternative, [EDMS 1528321](#)

¹ In some sense, this situation is even advantageous, because it will permit to rescue Novec without losses, while the water phase can be easily purified using conventional acid removal agents. The (small) amount of PFPrA that will be formed is easy to evaluate.