PPO® ForExt Forest fire extinguishing agent – Environmental and human safety

1. Manufacturer and Background

ForExt is produced in Finland by Kiilto Oy on behalf of PPO-Elektroniikka. Both are family-owned companies that operate in accordance with the principles of sustainability, safety, and responsibility.

ForExt has been developed specifically for the effective and safe extinguishing and containment of wildfires – with full consideration for both user safety and environmental protection.

The product contains **no fluorinated compounds, halogens, heavy metals**, surfactants or other harmful persistent substances.The ingredients used in ForExt are safe and do not leave permanent residues in the environment.

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2. Environmental Safety

The composition of ForExt has been assessed in accordance with the EU CLP Regulation (1272/2008/EC) and the GHS system. The product is **not classified as hazardous to the environment** under either system.

Note: In some countries, specific components are placed in the mildest GHS warning category. The EU CLP system does not apply this category separately, as these substances do not pose a real environmental risk. **ForExt is safe regardless of the classification system used.**

ForExt is a combination of organic compounds and harmless inorganic salts:

- The organic compounds are readily biodegradable.
- The inorganic salts are harmless to the environment at recommended use concentrations; they do not accumulate or cause long-term impacts.

Chemical safety assessments at **1% and 1–5%** use concentrations show that ForExt does **not** harm soil, vegetation, or aquatic life when used at the recommended dilution.

As a diluted working solution, ForExt does not pollute groundwater, and its components do not pose an environmental risk even with repeated use.

ForExt does **not** meet PBT (persistent, bioaccumulative, toxic) or vPvB (very persistent, very bioaccumulative) criteria. This means it does not contain slowly degrading, accumulating, or poisonous substances.

ForExt also has **no endocrine-disrupting properties**, and it does not contain substances that would cause long-term effects on the environment or living organisms.

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3. Human Safety

Based on its composition, ForExt is **not hazardous to people**.

Urea and glycerol are listed in the safety data sheet only because they have established occupational exposure limits under EU legislation. Their concentrations in the ForExt concentrate are very low. During use the mixture is diluted further with water at a **1–5 : 100** ratios.

For reference:

- **Urea** is a well-known, safe compound used for example as stump treatment in forestry and as a compost enhancer.
- **Glycerol** is a common ingredient in everyday consumer products such as shampoos, hand soaps, and dishwashing liquids.

ForExt contains no endocrine-disrupting substances and does not cause hormone-related or long-term health effects for users.

No special protective equipment is required beyond standard firefighting gear. Practical safety concerns at wildfire sites relate mainly to smoke and combustion gases – **not** to the extinguishing agent. The product does not release harmful vapours, nor does it irritate skin or eyes when diluted.

Importantly, the faster a fire is extinguished, the less firefighters are exposed to toxic gases and combustion particles. ForExt suppresses fire effectively, thereby significantly reducing exposure to smoke-borne chemicals.

ForExt-water mixtures can also be used to create an efficient firebreak:

- A sufficiently broad ForExt break is applied ahead of the fire in unburnt ground.
- It slows or stops the fire’s advance and provides safer working conditions by reducing heat and smoke.
- When the fire reaches the treated area, the flames diminish, slow down, and stop.

ForExt can be applied with any firefighting equipment, including trailers fitted on Finnish forestry machines such as Ponsse and Kesla harvesters. A well-ventilated tractor cab

keeps the operator protected from smoke and gases—an essential benefit during large fires and mop-up operations.

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4. Dilution Ratio

ForExt is always used diluted in water, according to instructions.

The use ratio is **1–5 : 100**, meaning that 1–5 litres of concentrate are mixed with 100 litres of water. Local representatives will provide case-specific advice on the correct ratio.

The safety data sheet describes the product in its concentrated form, as required by EU regulations. Safety assessments are based on the diluted working solution, which reflects real conditions in field use and wildfire suppression.

In this diluted form, ForExt is safe for users and the environment while providing an efficient and secure solution for extinguishing and containing wildfires.

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5. Summary

ForExt has been developed as a safe and environmentally friendly fire extinguishing agent:

- Contains **no fluorinated compounds, halogens, or heavy metals**
- **Not classified as hazardous** to people or the environment
- **Does not leave persistent residues**
- Contains **no PBT or vPvB substances**, and has **no endocrine-disrupting effects**
- **Safe to use** at recommended dilution ratios of **1–5 : 100**

The safety of ForExt is based on careful formulation, assessments by chemical safety specialists, PPO-Elektroniikka's fire safety expertise, and Kiilto's long experience in responsible chemical development.

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6. Technical information

Property	Value / Description
Dilution with water	1% (in challenging conditions, 1–5%)
Operating temperature	0°C to +50°C
Viscosity	Same as water
pH	approx. 8–9
Flash point	Non-flammable (> 60°C)
Shelf life	10 years
HS code	38130000
Delivery forms	By pallet or container. Test batches available in 10-litre cans.
Transport regulations	Not classified as dangerous goods (ADR/RID, IMDG, IATA)

More info:

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Additional instructions for national and regional conditions are available from the local ForExt representative.