

LONG-CHAIN PERFLUOROALKYL ACIDS (LCPFAAs)

Class or Substance Name

Long-Chain Perfluoroalkyl Acids (LCPFAAs)

Substance List by CAS Number

Each of the two classes of LCPFAAs include a large number of substances:

- Perfluoroalkyl sulfonates (PFSAs) with carbon chain lengths C6 and higher (e.g., 1763-23-1 Perfluorooctanesulfonic acid [PFOS] and related substances)
- Perfluorocarboxylic acids with carbon chain lengths C8 and higher (e.g., 335-67-1 Perfluorooctanoic acid [PFOA])

Description of Use in Apparel and Footwear

Durable water repellents (DWR) are topical finishes applied to fabrics to provide protection against water, oil and soil. DWR technology has historically been achieved with textile finishes that contain polymeric substances to which long-chain perfluoroalkyl groups are attached. These long-chain fluorinated polymers often contain trace levels of LCPFAAs as impurities. Additionally, residual raw materials from production of DWR as well as products incorporating DWR technology may degrade in the environment to form LCPFAAs. Breathable membranes made from the fluoropolymer polytetrafluoroethylene (PTFE) may have been made with PFOA during polymer production.

Why are LCPFAAs Restricted?¹

- Some LCPFAAs are very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
- Above certain exposure levels, some LCPFAAs may impair human fertility or cause harm to unborn children.
- Some LCPFAAs are persistent in the environment and may accumulate in humans and other mammals.
- Some LCPFAAs may result in the development of cancer above certain exposure levels.

LCPFAAs MAY BE FOUND IN:

- Textile or leather finishes with water, oil or stain repellency
- Products marketed as "all-weather"

Guidance: Sourcing LCPFAA-Compliant Materials from Your Material Suppliers (Textiles, Components and Trim Parts)

- Contact your suppliers and explain that fluoropolymers (for example, PTFE), fluorinated polymers or materials treated with a DWR finish must not utilize long-chain perfluoroalkyl or polyfluoroalkyl chemistry. All materials must contain <1 µg/m² of PFOS and <1 µg/m² of PFOA.²
- Share this information sheet with your material suppliers and instruct them to work with their chemical suppliers to source LCPFAA-compliant chemical formulations using the guidance in the next section.
- Have your suppliers confirm that their manufactured materials do not contain long-chain perfluoroalkyl or polyfluoroalkyl chemistry and meet the <1 µg/m² limits for PFOA and PFOS with a certification or, if necessary, by providing a test report from a third-party laboratory.
- Perform risk-based checks of your suppliers' materials by submitting samples to a third-party laboratory for PFOA and PFOS testing to ensure the 1 µg/m² limit³ is not exceeded.

¹ Classification and risk phrases according to European Union Council Directive 67/548/EEC or Directive 1999/45/EC.

² Limits taken from the AFIRM Restricted Substances Guidance (<http://www.afirm-group.com/rsl-guidance/>). These are the lowest agreed upon limits on PFOS and PFOA in products among AFIRM brands. Check with brands for their individual limits.

³ Published, validated test method for area-based limit does not yet exist and there is wide variability across laboratories.

Guidance: Sourcing LCPFAA-Compliant Formulations from Your Chemical Suppliers

- Contact your DWR supplier and request fluorine-free repellent finishes or finishes based on short-chain perfluoroalkyl groups. PFOS concentrations in all chemical formulations should be <2 ppm (0.0002%) and PFOA concentrations should be <2 ppm (0.0002%).⁴
- Contact your PTFE or PTFE-membrane supplier and request fluoropolymer made without PFOA.
- Use the questions below to guide your conversation with suppliers to ensure that the DWR formulation you are purchasing does not contain and cannot break down to form LCPFAAs:
 1. What is the chemical manufacturer's name?
 2. What is the fluorinated DWR product trade name?
 3. What performance effects does this product offer?
 4. On what technology platform or chemistry is the DWR based?
 5. Is the chemistry based on long-chain or short-chain technology?
 6. Is the DWR product compliant with the U.S. Environmental Protection Agency (USEPA) 2010/15 stewardship program and the European Union marketing and use restrictions for PFOS and related substances?
 7. Is the DWR product registered on:
 - a. USEPA Toxic Substances Control Act (TSCA) inventory by filing of a Pre-Manufacturing Notification (PMN)?
 - b. Canadian Domestic Substances List (DSL)?
 - c. National Industrial Chemicals Notification and Assessment Scheme (NICNAS) in Australia?
 8. Do you have mammalian toxicity data for the product?
 9. Do you have aquatic toxicity, bioaccumulation and environmental fate data for the product?
 10. Do you have a documented product stewardship process to assess the worker, consumer and environmental impacts of the DWR product through the entire product life cycle?
 11. Has the DWR product been assessed by a third party such as bluesign® in the bluefinder or in finished product by OEKO-TEX® 100/1000?

If your supplier answers "no" or "I don't know" to any of the above questions, it is possible that the product you are using contains long-chain perfluoroalkyl or polyfluoroalkyl substances that could contain or breakdown into LCPFAAs. Work with your supplier to obtain clear answers to your questions. If you cannot get clear answers, you should cease using the DWR product and substitute with a known short-chain or other alternative that is not based on long-chain perfluoroalkyl or polyfluoroalkyl substances.

If necessary, perform risk-based checks of your chemical suppliers' DWR formulations by submitting samples to a third-party laboratory for testing to ensure the PFOS <2 ppm and PFOA <2 ppm limits are not exceeded.

Safer LCPFAA Alternatives

- Fluorinated polymer finishes approved by regulators that are based on short-chain chemistry and CANNOT breakdown into PFOA or PFOS and also are compliant with the ZDHC MRSL.
- Finishes not based on long-chain perfluoroalkyl or polyfluoroalkyl substances and that are ZDHC MRSL compliant.
- Materials that are naturally water-resistant due to other chemical or mechanical properties and are ZDHC MRSL compliant.

⁴ Limits taken from the ZDHC Manufacturing Restricted Substances List (MRSL) (<http://www.roadmaptozero.com/df.php?file=pdf/MRSL.pdf>) and are the limits on unintended PFOS and PFOA in chemical formulations accepted by ZDHC member brands.