



## 2 PFAS Chemistry and Naming Conventions, History and Use of PFAS, and Sources of PFAS Releases to the Environment

PFAS chemistry was discovered in the late 1930s. Since the 1950s, many products commonly used by consumers and industry have been manufactured with or from PFAS, as the unique physical and chemical properties of PFAS impart oil, water, stain, and soil repellency, chemical and thermal stability, and friction reduction to a range of products. These products have application in many industries, including the aerospace, semiconductor, medical, automotive, construction, electronics, and aviation industries, as well as in consumer products (such as carpets, clothing, furniture, outdoor equipment, food packaging), and firefighting applications ([3M Company 1999a](#); [Buck et al. 2011](#); [KEMI 2015a](#); [USEPA 2017b](#)).

The number of PFAS and their uses have expanded over the years. It has been estimated that the PFAS family may include approximately 5,000-10,000 chemicals ([USEPA 2018i](#)). A recent inventory of PFAS identified Chemical Abstracts Service (CAS) Registry Numbers for more than 4,700 PFAS that could have been, or may be, on the global market ([OECD 2018](#)), although the uses of each of these PFAS may not be known ([KEMI 2015a](#)). Publicly available health and toxicity studies are limited to only a small fraction of these PFAS, and modern commercially available analytical technologies typically identify only about 20-30 PFAS.

Scientific, regulatory, and public concerns have emerged about potential health and environmental impacts associated with chemical production, product manufacture and use, and disposal of PFAS-containing wastes. These concerns have led to efforts to reduce the use of or replace certain PFAS, such as the two most widely produced, commonly encountered, and most studied compounds: perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) ([USEPA 2016e](#); [WA DER 2017](#)).

The objective of this section is to lay a foundation for identifying potential PFAS sources in the environment.

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