SUPPLEMENTAL FILE A: PFAS PRIORITIZATION APPROACH

Per– and Polyfluoroalkyl Substances (PFAS): Next Steps for Hazard, Exposure, and Risk Analyses (CPSC Contract Number 61320622A0005, CPSC Order Number 61320623F2025)

May 23, 2025

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1. Introduction

This document describes the approach used to identify a prioritized set of PFAS chemicals for evaluation in the main report. In the following sections, we describe:

A. PFAS chemicals with available toxicity and consumer use data

B. Categorization of PFAS chemicals into product use categories

C. Ranking of PFAS–product combinations qualitatively based on exposure potential

The final list of prioritized chemicals is provided in Section 5.

2. PFAS Chemicals with Available Toxicity and Consumer Use Data

2.1. Toxicity Data

The initial list of PFAS chemicals was obtained from the *Characterizing PFAS Chemistries, Sources, Uses, and Regulatory Trends in U.S. and International Markets: Final White Paper* (referred to hereon as White Paper) and contained 16,229 chemicals. Due to this large number, chemicals were first assessed for evidence of toxicity data using the following sources:

- EPA's CompTox Chemicals Dashboard, batch download on August 31, 2023. The ToxVal Data Availability parameter notes which chemicals have data in the ToxVal database, where ToxVal compiles data from 18 different databases.

- EPA's Comprehensive PFAS Evidence Map Visualizations, which at the time of data download (September 19, 2023), noted the chemicals with animal studies identified during literature

inventory for 12 EPA assessments (Expanded PFAS Evidence Map Publication; PFAS 150 Evidence Map Publication; 5 Integrated Risk Information System Toxicological Reviews; 2 Office of Water Assessments; 3 Office of Research and Development Assessments).

- White Paper supplemental file, *PFAS Literature on Exposure, Toxicity, and Health Risk.xlsx*. The Tier 1 Evidence and Tier 2 Toxicity and Risk Literature tabs represent the screening results from the literature search conducted. The list of chemicals with toxicity data in the literature was obtained from:
    - Tier 1 Evidence filtered for (i) "Evidence Topic" to include Toxicity and (ii) "Decision for Next Steps" (after title–abstract screening) = Include for full–text.
    - Tier 2 Toxicity and Risk Literature filtered for (i) "Evidence Topic" to include Toxicity and (ii) "Decision for Next Steps" (after title–abstract screening) = Include for Level 2.

- PubChem, batch download on November 19, 2023. The annotation categories ("annothits" column) was filtered for Toxicity.

Of the 16,229 chemicals, 557 were identified to have toxicity data available from one or more of the sources listed above.

2.2. Consumer Product Data

We considered the following data sources to identify PFAS chemicals reported in specific consumer products:

- Holder et al. (2023) occurrence database. The database contains data extracted from peer-reviewed studies from 20 PFAS in various media, including consumer products. The following filters were applied: (i) "Medium" = Consumer products and (ii) "DF" to exclude 0 and ND.

- White Paper supplemental file, *PFAS Source Characterization Database.xlsx*. The Sources in Consumer Products tab is a compiled list, from several datasets, of consumer products that may contain PFAS.

- White Paper supplemental file, *PFAS Literature on Exposure, Toxicity, and Health Risk.xlsx*. The Tier 1 Evidence and Tier 2 Exposure Literature tabs represent the screening results from the literature search conducted. The list of chemicals with product use data in the literature was obtained from:
    - Tier 1 Evidence filtered for (i) "Evidence Topic" to include Exposure, (ii) "Decision for Next Steps" (after title–abstract screening) = Include for full–text, (iii) "Exposure Matrices" to include Consumer product (or adjacent), and (iv) "Include this Reference" (after full–text screening) = Yes.
    - Tier 2 Exposure filtered for (i) "Evidence Topic" to include Exposure, (ii) "Decision for Next Steps" (after title–abstract screening) = Include for Level 2, (iii) "Exposure Matrices" to include Consumer product (or adjacent), and (iv) "Include this Reference" (after full–text screening) = Yes.

- European Chemicals Agency (ECHA) REF-10 Enforcement Project report. The enforcement project sought to check the rate of compliance of consumer products with the EU chemical regulations.

- Patent data provided in the White Paper supplemental file, *PFAS Source Characterization Database.xlsx*. Patents were screened at the title-abstract level only for chemicals with no other product use data[1]. Full-text screening was performed only for patents where title-abstract screening was unclear.
    - Patents with the following CPC codes were excluded:
        - Containers specifically adapted for medical or pharmaceutical purposes
        - Cosmetics or similar toilet preparation
        - Dairy products
        - Food, foodstuffs, or non-alcoholic beverages
        - Specific use of cosmetics or similar toilet preparations
    - Patents from the following non-English-speaking countries were not reviewed: Brazil, Switzerland, China, Czech Republic, Germany, European Patent Office, Spain, Finland, France, Hungary, Japan, South Korea, Mexico, Poland, Portugal, Russia, Slovenia, Taiwan

Of the 557 chemicals with toxicity data available, 326 were identified with known or potential use in specific consumer products.

Note that three other data sources reported data that indicated a consumer use but did not have specific consumer product information and were therefore not used. These three sources were:

- ECHA's Substances of Concern in Articles or Products (SCIP) database, downloaded on August 31, 2023.

- EPA's CompTox Chemicals Dashboard, batch download on August 31, 2023, for chemicals on any inventory (PUBCHEM Use and Mnfg Info, PFASKEMI, TSCA INV_ANY, EINECS, and CANADADSL).

- The proposed TSCA Reporting and Recordkeeping Requirements for PFAS rule.

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[1] For patent data, screening was conducted for chemicals with 'no other product use data' which were identified by considering the Holder et al. (2023) database and the two White Paper supplemental files. Following the mapping of individual consumer products to product use categories (see Section 3.1), one chemical was identified that was not mapped to a product use category but had unscreened patent data – this chemical was likely from one of the three sources (i.e., SCIP, CompTox, TSCA rule). Patent data for this chemical was therefore screened.

3. Categorization of PFAS Chemicals into Use Categories

3.1. Product Use Categories

Due to the large number of PFAS chemical–individual product listings, we grouped the individual consumer products identified in Section 2.2 into 27 broad product use categories (see Table 1) where each individual consumer product was mapped to at least one of the product use categories. For example, stain proofing agents were mapped to "Textile and leather finishing products (stain removed, waterproofing agent, leather tanning)" while clothing were mapped to "Textile with contact and mediated exposure (clothing)." Table 1 also shows the exposure pathways for each product use category, with the following four mediated and two contact exposure pathways considered:

1. Ingestion of indoor dust: this mediated pathway models incidental ingestion of settled dust (floor dust, surface dust).

2. Gas–phase air transfer to skin: this mediated pathway models the chemical deposition directly onto the skin from the gas phase, followed by dermal absorption.

3. Inhalation of particle dust: this mediated pathway models inhalation of airborne particulates, followed by absorption in the gastrointestinal tract.

4. Inhalation of gas: this mediated pathway models inhalation of gas, followed by lung absorption.

5. Dermal: this contact pathway models direct contact of the product with the skin, with chemical migration into the skin over time.

6. Mouthing/oral: this contact pathway models direct product-to-mouth contact, where the chemical migrates into saliva.

The approach of defining broad product use categories and the exposure pathways considered are consistent with (i) the workflow used in class-based exposure assessment of organohalogen flame retardants developed under a previous call order under this contract (Call Order No. 61320622F2012) and (ii) the SVOCs consensus framework developed by Eichler et al. (2020).

Each individual product was mapped to one or more of the 27 product use categories. For products that did not fit any of the 27 categories (e.g., refrigerant), these were mapped to a 28th category for 'Unknown'. Of the 326 chemicals with individual product use data, 275 were mapped to at least one of the 27 defined categories.

Table 1. List of Product Use Categories for PFAS Chemicals.

#	Product Use Category	Example Products	Exposure Pathways[a]
1	All-purpose liquid cleaner (note, diluted or not-diluted)	Cleaning agents	2, 4, 5 (adult only)
2	All-purpose spray cleaner	Spray cleaners	2, 4, 5 (adult only)
3	All-purpose waxes and polishes (furniture, floor, etc.)	Waxes, polishes	2, 4, 5 (adult only)
4	Exterior car wax and polish	Car waxes/polishes	2, 4, 5 (adult only)
5	Shoe polish, shoe wax	Shoe waxes/polishes	2, 4, 5 (adult only)
6	Anti-static spray fabric protector	Anti-static fabric sprays	2, 4, 5 (adult only)
7	Textile and leather finishing products (stain remover, waterproofing agent, leather tanning)	Stain proofing agents, water/oil repellents	2, 4, 5 (adult only)
8	Wall paint (solvent- or water-based)	Paints	2, 4, 5 (adult only)
9	Varnishes and floor finishes	Varnishes, floor finishes	2, 4, 5 (adult only)
10	Continuous action air fresheners	Continuous air fresheners	2, 4
11	Caulk (sealant)	Caulk	2, 4, 5 (adult only)
12	Degreasers	Degreaser	2, 4, 5 (adult only)
13	Glues and adhesives (small scale)	Sealants, adhesives, bonding agents	2, 4, 5 (adult only)
14	Lubricants (non-spray)	Lubricants, greases	2, 4, 5 (adult only)
15	Lubricants (spray)	Lubricant sprays	2, 4, 5 (adult only)
16	Product applied as a spray that cures (large source, building material)	Foam insulation	2, 4
17	Product that is sprayed (fire suppression)	Fire extinguishers	2, 4, 5 (adult only)
18	Article with mediated exposure that is heated (small source)	Lamps, circuit board coatings	1, 2, 3, 4
19	Article with contact and mediated exposure that is ingested (small source)	Chipped off cookware	1, 2, 3, 4, 5, 6 (children only)
20	Article with contact and mediated exposure (hard plastic, small source)	Handheld electronics, toys	1, 2, 3, 4, 5, 6 (children only)
21	Article with contact and mediated exposure (hard plastic, medium source)	Large electronics	1, 2, 3, 4, 5, 6 (children only)
22	Article with contact and mediated exposure (foam, medium source)	Foam mattresses or furniture	1, 2, 3, 4, 5, 6 (children only)

#	Product Use Category	Example Products	Exposure Pathways[a]
23	Article with mediated exposure (wood, large, building materials)	Treated lumber (e.g., decks)	1, 2, 3, 4
24	Article with contact and mediated exposure (soft plastic, large, building materials)	Laminate flooring	1, 2, 3, 4, 5, 6 (children only)
25	Textile with contact and mediated exposure (clothing)	Clothing	1, 2, 3, 4, 5, 6 (children only)
26	Textile with contact and mediated exposure (furniture/medium surface area)	Furniture	1, 2, 3, 4, 5, 6 (children only)
27	Textile with contact and mediated exposure (building material/large surface area)	Carpet	1, 2, 3, 4, 5, 6 (children only)

EPS = expanded polystyrene; XPS = extruded polystyrene; SPF = spray polyurethane foam.
[a]Pathway numbers refer to: 1 = ingestion of indoor dust; 2 = gas–phase air transfer to skin; 3 = inhalation of particle dust; 4 = inhalation of gas; 5 = dermal contact; 6 = mouthing.

3.2. Plausibility of Chemical–Product Use Category Listings

The plausibility of each chemical-product use category combination was evaluated using two approaches: (i) physicochemical outliers and trends analyses and (ii) expert elicitation. The physiochemical outliers and trends analyses are useful for determining whether a chemical is likely to be used for that product category (e.g., if it has a similar boiling point to other chemicals in that product use category). The expert elicitation provides qualitative descriptions useful for corroborating or refuting categorizations of chemicals.

3.2.1. Outliers and Trend Analyses

All analyses were conducted within a product use category. Based on the mapping of PFAS chemicals to product use categories, each product use category contained one or more chemicals. For this analysis, predicted or empirical physicochemical properties from U.S. EPA's CompTox Chemicals Dashboard (downloaded May 31, 2024) were used. Chemicals without physicochemical property values were not included in the analysis and multiple values for the same property from different sources were averaged. The properties considered were chosen based on their relevance to product formulation based on expert judgement; the properties are:

   (i)   boiling point (BP),

   (ii)   log of Henry's Law constant (logHL),

   (iii) log of octanol–water partition coefficient (logK$_{OW}$),

   (iv)   log of vapor pressure (logVP),

   (v)   melting point (MP),

(vi)   molecular weight (MW),

(vii) acid dissociation constant (pK$_A$)

(viii) polarizability (pol),

(ix)   surface tension (ST), and

(x)   water solubility (WS).

The distribution of values for each property within each of the 27 product categories was plotted and z-scores were used to identify outliers, if any. An example distribution with outliers is shown in Figure 1.
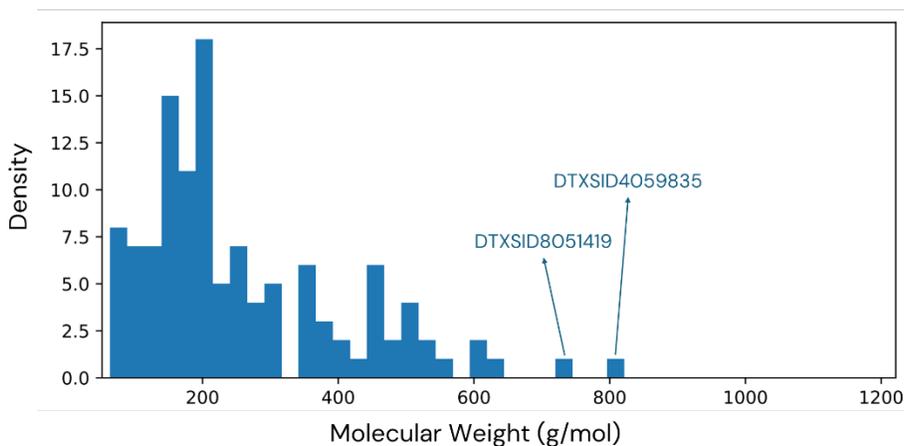

Figure 1. Density Distribution of Molecular Weight (MW) Values for Product Use Category 1 – All-Purpose Liquid Cleaners.

There were two MW outliers according to z-score for product use category 1, which corresponded to N-[(perfluorooctylsulfonamido)propyl]–N,N,N–trimethylammonium iodide and fluorocarbon FC 70.

Outliers were then manually reviewed to evaluate the scientific reasons or plausibility of the outliers to determine if they were true or false outliers. For example, upon manual review, all pK$_A$ outliers were determined to be pK$_A$ values for non–hydrogen atoms and we deemed these to be false outliers since the desired comparison was only for Brønsted acids. These pK$_A$ values were manually removed from the chemical properties list used for analysis but the chemicals remained in the product category they were assigned. As an example of a true outlier, N-[(perfluorooctylsulfonamido)propyl]–N,N,N–trimethylammonium iodide (DTXSID8051419) was flagged as an outlier for BP, MW, and MP in product category 1 (all–purpose liquid cleaner), and for BP in product category 2 (all–purpose spray cleaner). Upon manual review, we concluded that these physicochemical property values were valid for the chemical, and therefore this chemical was considered a true outlier and was unlikely to fit into product categories 1 and 2. These decisions were further supported by expert judgement (see Section 3.2.2).

Overall, there were 39 chemicals identified as outliers across 109 individual chemical-product use category combinations. Many of the outlier combinations were for the same chemical for different properties within one product category, or across product categories for the same property. For example, perfluorooctanesulfonate (DTXSID80108992) was determined to be an outlier for three properties in product category 6 (anti-static spray fabric protector), and fluorocarbon FC 70 (DTXSID4059835) was determined to be an outlier for $logK_{OW}$ in 12 product use categories.

We also investigated if there were inter-category trends among the 10 physicochemical properties after excluding outliers. We sought to determine if property distributions were unique to product use categories by plotting the mean and standard deviation of a property for all chemicals in each product use category. To aid visualization, the product use categories were reordered from the lowest to highest mean values (Figure 2 is a representative plot). The result from this effort qualitatively supported our chemical-product category combinations. Using melting point as an example (Figure 2), we can interpret that PFAS in product category 5 (shoe polish or wax) have much higher melting points than PFAS in category 6 (anti-static spray fabric protector), which accurately matches the physical states of the respective consumer products.
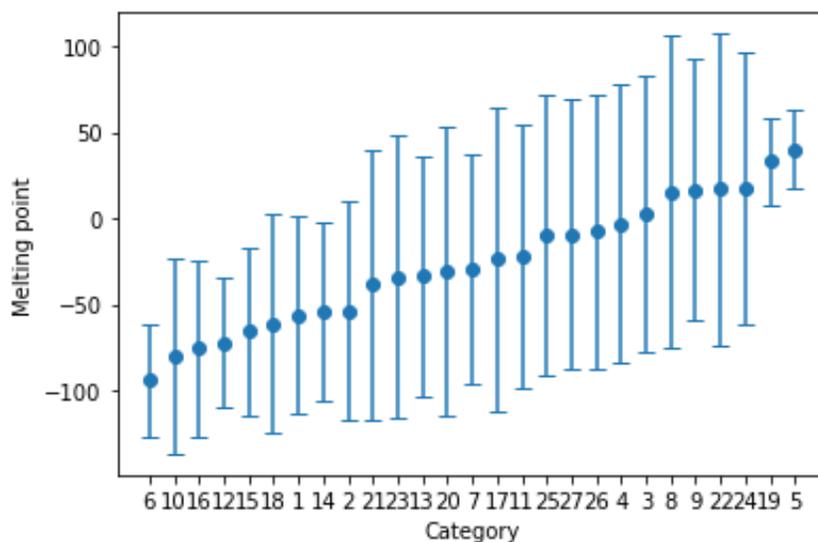

Figure 2. Mean and Standard Deviation of Melting Point for Chemicals within Each Product Use Category, Displayed from Lowest to Highest Mean Value on the x-axis.

The trend analysis also provided insight on what categories did not have clearly defined physicochemical properties, which is useful when considering the next phase of this work (outside the current scope). In particular, product category 7 (textile and leather finishing products) was consistently positioned in the center of trend plots for all properties and had large uncertainty bars. This result suggests that this product category is not chemically unique, which could be the result of the diversity of textile substrates. Future efforts for understanding chemical property to product relationships for product category 7 will likely require additional subcategories.

3.2.2. Expert Elicitation

We identified an expert with experience in polymer chemistry, manufacturing processes, and PFAS materials to assess the plausibility of the chemical–product use category combinations and to provide insight on how PFAS are broadly used industrially to manufacture materials that are used in consumer products.

PFAS chemicals were reviewed and assigned to one of nine broad chemical groups developed by the expert. The nine chemical groups were based primarily on combinations of their physicochemical properties (BP, MP, and WS) and structural features. For each of the 27 product use categories, professional judgement was used to determine if a chemical group was (i) likely, (ii) potentially likely, (iii) unlikely, or (iv) highly unlikely to be found in the product category[2]. The expert elicitation findings were used to verify specific chemical–product combinations prioritized for assessment (Section 4).

3.2.3. Final List of Plausible Chemical–Product Combinations

The results of the outlier analysis were used to remove 109 individual chemical–product use category combinations from the initial list developed. This resulted in a refined chemical–product mapping file of 259 chemicals mapped to the 27 product use categories.

4. Ranking of PFAS–Product Combinations Qualitatively Based on Exposure Potential

We qualitatively ranked the chemicals based on exposure potential to narrow down the list of PFAS chemicals to ones with a higher likelihood of exposure, and therefore of higher priority for assessment by CPSC. In this section, we describe (i) the criteria used to evaluate exposure potential (Section 4.1), (ii) the prioritization approach used (Section 4.2), and (iii) corroboration of the prioritized list of chemicals through comparison with existing lists in the literature (Section 4.3).

4.1. Criteria for Determining Exposure Potential

We conducted interviews with two exposure scientists to identify key factors to consider when determining PFAS exposure potential from consumer products. The experts noted several important points regarding PFAS chemicals as individual molecules versus polymers, relevant exposure pathways, the role of physicochemical properties in determining the chemical interactions with the environment, as well as other key takeaways.

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[2] The number of chemical–product combinations were too numerous (>3,500) to manually review and therefore chemical category–product use categories were assessed.

4.2. Tiered Prioritization Approach

Based on the discussions with the exposure scientists, we developed the following three-tier prioritization approach for ranking chemicals (see Figure 3):

- Tier 1: Each chemical is scored based on (i) chemistry rankings (low or high) and (ii) high-level product use indicators (low or high). Chemicals that scored high in both criteria move forward to Tier 2.

- Tier 2: Each chemical is scored based on its presence in consumer products and each product's exposure potential.

- Tier 3: Each chemical is assessed for data availability. Chemicals with (i) either 1 identified animal study from previous EPA mapping projects or ≥10 hits from initial hazard/dose response literature searches and (ii) at least one hit from chemical-only[3] literature searches were prioritized.

The chemicals that passed all three prioritization tiers were then reviewed by CPSC staff and prioritized or deprioritized based on professional judgement.
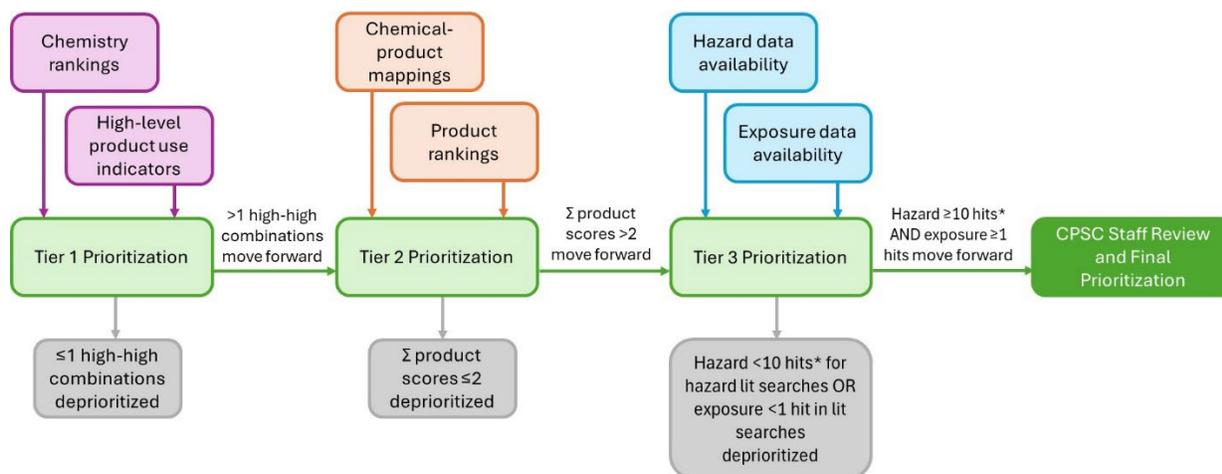
*1 animal study from Tableau is enough to meet the hazard data availability criteria

Figure 3. Tiered Prioritization Approach Used to Identify a List of Priority PFAS Chemicals

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[3] In the absence of exposure literature searches, we used chemical-only literature search results as a proxy for exposure.

4.2.1. Tier 1 Prioritization

Two criteria were used in Tier 1 prioritization: chemistry rankings and high-level product use indicators. Chemistry rankings were developed by considering the three physicochemical properties considered as most relevant to each exposure route and also taking into account doses estimated by EPA's ExpoCast. Table 2 lists the criteria and scoring system used. For each chemical, a normalized chemistry score was calculated by summing the scores across the 10 criteria and dividing by the total possible score for the respective chemical. OPERA predictions were used for all physicochemical properties (downloaded in May 2024 from U.S. EPA's CompTox Chemicals Dashboard). If a value was not available for a chemical, that property was not scored and the total possible score was reduced accordingly. Chemicals with a normalized score ≥0.5 were assigned to 'High' exposure potential based on physicochemical properties while chemicals with a score <0.5 were assigned to 'Low' exposure potential.

To account for whether a chemical would be found in a consumer product, we used high-level product use indicators, where high-level encompasses any data source that indicated a use even if there was no specific consumer product information. Because there are a variety of product use indicators and different ways to combine them, we considered several indicators and various ways to combine them:

- Product of [number of product use categories a chemical is mapped to, as described in Section 3] and [number of ECHA REACH Registration Counts (downloaded on April 11, 2024)]

- Sum of [number of product use categories a chemical is mapped to, as described in Section 3] and [number of ECHA REACH Registration Counts]

- Counts of data sources (downloaded on June 5, 2024 from CompTox)

- Counts of patent data (from the White Paper supplemental file, *PFAS Source Characterization Database.xlsx*)

- Product of [counts of patent data] and [number of ECHA REACH Registration Counts]

- Sum of [counts of patent data] and [number of ECHA REACH Registration Counts]

For combinations where two indicators were multiplied together, a value of 1 was assigned if an indicator did not have a value. For each of the six indicators/combinations, a chemical was assigned to 'Low' exposure potential based on use if its value was below the median of all chemicals and 'High' exposure potential if it was higher or equal to the median. For example, for the indicator 'counts of data sources', the median value across all chemicals was 34. Chemicals with less than 34 counts of data sources received a "low" score.

The chemistry scores and high-level product use scores were then combined together to form an overall chemistry-use score which had four possible outcomes: high-high, high-low, low-high, and

low–low. Because there were six possible combinations of high–level use indicators, each chemical had six chemical–use scores. Chemicals with >1 high–high combinations passed Tier 1 prioritization. The final number of chemicals that passed Tier 1 prioritization was 175.

Table 2. Criteria Used for Chemistry Rankings

	Criteria	Rationale	Score 0	Score 1	Score 2	Units	Source
Inhalation	Boiling point	Boiling point <30°C means chemical is likely a gas, making it easier to inhale. However, this also means it will dissipate quickly and therefore ongoing exposure is unlikely. Since exposure would be considered acute, a high score of 2 was not assigned for this property.	≥30	<30	NA	°C	Expert knowledge and judgement
	Vapor pressure	Increased vaporization leads to increased inhalation potential. Limits chosen from reference source.	$\leq 10^{-6}$	$>10^{-6}$	$>10^{-4}$	mm Hg	Greggs et al. 2018, Table 1
	Henry's law constant	Increased volatility from aqueous formulations leads to increased inhalation potential. Limits chosen from reference source.	$\leq 10^{-7}$	$>10^{-7}$	$>10^{-3}$	(atm-m^3)/mol	Greggs et al. 2018, Table 1
Dermal	Molecular weight	Higher molecular weight compounds are less likely to enter body through the skin. Limit chosen from reference source. Since this was a binary choice between likely exposure or nonsignificant exposure, no scores of 1 were assigned for this property.	<500	NA	≥500	g/mol	Greggs et al. 2018, Table 1
	Boiling point	Boiling point >30°C means chemical is not a gas, making it likely to transfer to skin at relevant concentrations and potentially absorb (ignoring vapor deposition). However, skin transfer does not necessarily mean skin absorption and therefore this property was assigned high score of 2.	≤30	>30	NA	°C	Expert knowledge and judgement
	Octanol–water partition coefficient	A logK$_{OW}$ score of 4–9 is more likely to absorb through the skin and >10 is not bioavailable (Greggs et al. 2018). LogD5.5 accommodates charged states, if any, at pH 5.5 (close to skin pH).	<0, >9	0–4	4–9	NA	Hubbard et al. 2022
Ingestion (likelihood in dust)	Octanol–air partition coefficient	LogK$_{OA}$ of 7 or greater increases likelihood of chemical binding to dust. Cutoff of 7 from the DustEx model.	≤7	NA	>7	NA	DustEx
	Acid dissociation constant	If chemical is predominantly charged at pH 6–8, it is more likely to stick to surfaces, especially hydrophilic textiles.	>8	≤8	≤6	NA	Expert knowledge and judgement
	Molecular weight	Higher molecular weight compounds are less likely to migrate off surfaces. Generally molecular weight can be negatively correlated to vaporization potential and positively correlated to surface area (i.e., increased Van der	≤350	>350	NA	g/mol	Stock et al. 2004; Zhang et al. 2020; Expert knowledge and judgement

Criteria	Rationale	Score 0	Score 1	Score 2	Units	Source
	Waal's forces) for chemicals of similar structure. The limit chosen was based on reported sublimation and vapor pressures for PFAS combined with expert opinion.					
Estimated Dose — Estimated dose	If a chemical had an estimated dose above the 50th percentile for this group of PFAS chemicals, 8.64E–07 mg/kg/day, it received a higher ranking and a score of 2. If a chemical had an estimated dose less than the 50th percentile, it received a lower ranking and a score of 0.	≤8.64E–07	NA	>8.64E–07	mg/kg/day	CPSC provided rationale; not PFAS specific.

4.2.2. Tier 2 Prioritization

In Tier 2 prioritization, we first developed exposure potential scores for each product use category and then used them, along with the individual chemical–product use category mapping results described above, to determine an aggregate score across all products for each chemical.

Exposure potential scores for each product use category were first estimated by separately evaluating inhalation, ingestion, and dermal exposure using the criteria shown in Table 3. Different criteria were used for products and articles. Scores of high, medium, and low were assigned based on professional judgement and corresponded to numerical scores of 3, 2, and 1, respectively. For 'direct release to air', only yes and no were available, corresponding to 1 and 0, respectively. For each use category, a normalized product score was calculated by summing the scores across the three pathways and dividing by the total maximum possible score (which differed between products and articles). Product use categories 5 (shoe polish, shoe wax) and 12 (degreasers) had the lowest normalized product score of 0.325 while use categories 25 (textile with contact and mediated exposure – clothing) and 26 (textile with contact and mediated exposure – furniture/medium surface area) had the highest normalized product score of 0.878.

The individual chemical–product use category mapping results were then used to determine if a chemical was present in a use category. For each chemical, the product scores from relevant use categories were summed to obtain an aggregate product score, with aggregate scores up to 13.94. Chemicals with aggregate scores >2 passed Tier 2 prioritization. Of the 175 chemicals that passed Tier 1 prioritization, 114 passed Tier 2 prioritization.

Table 3. Criteria Used for Product Scores

Parameter	Definition	Possible Scores	Product	Article	Inhalation	Ingestion	Dermal
Household prevalence	Likelihood that the consumer product/article is present in a household	High = many/all homes Medium = some homes Low = very few homes	x	x	x	x	x
Frequency of use	How often a product is used	High = many events/year Medium = some events/year Low = very few events/year	x		x	x	x
Mass of product	Amount of product used per event	High Medium Low	x	x	x	x	x
Direct release to air	Potential for spray application (all kinds)	Yes = may be sprayed No = cannot be sprayed	x		x		
Dust/particle generation	Potential to generate dust or particles during use	High Medium Low	x	x		x	
Surface area of article or affected area	Surface area of the article	High Medium Low	x	x	x		
Dermal contact area	Area of skin in direct contact with the article	High = most of the body Medium = some of the body (e.g., hands) Low = a few spots on the body		x			x
Duration of product use/article contact	Average time a person is in contact with a product (per use) or article (per day, assumes "use" everyday)	High Medium Low	x	x		x	x

4.2.3. Tier 3 Prioritization

Tier 3 prioritization assessed whether hazard and exposure data were available for each chemical. At the time Tier 3 prioritization was conducted, the following literature searches had been completed as described in Section 3.1 in the main report: (i) chemical-only[4] and (ii) chemical AND hazard/dose response/TRV[5] searches. In addition, literature inventory results – essentially a high-level study summary of the available toxicity data – from previous EPA evidence mapping projects were used. We considered hazard data to be available if there was at least 1 animal study identified from the previous EPA projects or at least 10 hits from the chemical AND hazard/dose response/TRV searches. Because exposure terms were not searched, the chemical-only search results were used as a surrogate for exposure and we considered exposure data to be available if there were >0 hits. Based on hazard and exposure data availability, 46 chemicals passed Tier 3.

4.2.4. CPSC Staff Prioritization

Based on CPSC staff's professional judgement, which considered uses, type of PFAS, overall data availability, and diversity of chemicals being considered, the 46 chemicals that pass Tier 3 prioritization were reviewed for prioritization. Twenty-two chemicals were prioritized for next steps (referred to hereon as the ICF list) and 24 were deprioritized for now.

4.3. Corroboration with Other PFAS Chemical Lists

To corroborate the ICF list of chemicals developed using the tiered prioritization approach, CPSC staff compiled a separate list of priority PFAS (referred to hereon as the CPSC list) using a different approach. Lists of PFAS chemicals published in peer-reviewed journal articles or developed by other organizations with hazard, exposure, and product use data were used to identify chemicals with all three data types. Twenty-two chemicals were identified by CPSC staff with hazard, exposure, and product use data, with 9 of the chemicals also on the ICF list.

5. Final List of Prioritized Chemicals

Combining the CPSC list with the ICF list resulted in a total of 35 chemicals. CPSC staff reviewed this combined list and identified 25 chemicals for CPSC and ICF to move forward with next steps and 12 chemicals to deprioritize for now. Table 4 shows the final list of prioritized chemicals, including current vendors of the chemical, if applicable.

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[4] Chemical-only searches were conducted for (i) chemicals that are not part of an EPA project/assessment (searched with date limit) and (ii) chemicals that are part of an EPA project but previously returned 0 hits (searched from the date of the last EPA search). Searches were conducted since January 2021, January 2022, or January 2024, depending on the EPA project.

[5] For the chemical AND hazard/dose response/TRV searches, chemicals that are part of an EPA evidence mapping project were searched from the date of the last EPA search.

Table 4. Final List of Prioritized PFAS Chemicals.

CASRN	Chemical Name	Chemical Abbreviation	PFAS Category	Chain Length	Current Vendor	In CPSC List	In ICF List
Chemicals for ICF to Assess							
647–42–7	Fluorotelomer alcohol 6:2	6:2 FTOH	Fluorotelomer alcohols	6	Sigma-Aldrich	X	X
678–39–7	Fluorotelomer alcohol 8:2	8:2 FTOH	Fluorotelomer alcohols	8	Sigma-Aldrich	X	X
754–91–6	Perfluorooctanesulfonamide	PFOSA	Perfluoroalkane sulfonamides	8		X	X
375–22–4	Perfluorobutanoic acid	PFBA	Perfluorocarboxylic acids	4	Apollo Scientific	X	X
375–85–9	Perfluoroheptanoic acid	PFHpA	Perfluorocarboxylic acids	7	Apollo Scientific	X	X
307–24–4	Perfluorohexanoic acid	PFHxA	Perfluorocarboxylic acids	6	TCI America	X	X
375–73–5	Perfluorobutanesulfonic acid	PFBS	Perfluorosulfonic acids	4	TCI America	X	X
75–37–6	1,1-Difluoroethane	DFE	Short-chain hydrofluorocarbons	2			X
811–97–2	1,1,1,2-Tetrafluoroethane	TFE	Short-chain hydrofluorocarbons	2			X
3825–26–1	Ammonium perfluorooctanoate		Perfluoroalkyl carboxylate salt	8	SynQuest Laboratories		X
Chemicals for CPSC to Assess							
24448–09–7	N-Methyl-N-(2-hydroxyethyl)perfluorooctanesulfonamide	N-MeFOSE	Perfluoroalkane sulfonamides	8	MuseChem	X	
31506–32–8	N-Methylperfluorooctanesulfonamide	N-MeFOSA	Perfluoroalkane sulfonamides	8		X	
335–76–2	Perfluorodecanoic acid	PFDA	Perfluorocarboxylic acids	10	Sigma-Aldrich	X	
375–95–1	Perfluorononanoic acid	PFNA	Perfluorocarboxylic acids	9	Oakwood Products	X	
335–67–1	Perfluorooctanoic acid	PFOA	Perfluorocarboxylic acids	8	TCI America	X	X

CASRN	Chemical Name	Chemical Abbreviation	PFAS Category	Chain Length	Current Vendor	In CPSC List	In ICF List
2706-90-3	Perfluoropentanoic acid	PFPeA	Perfluorocarboxylic acids	5	SynQuest Laboratories	X	X
422-64-0	Perfluoropropanoic acid	PFPA	Perfluorocarboxylic acids	3	Apollo Scientific		X
335-77-3	Perfluorodecanesulfonic acid	PFDS	Perfluorosulfonic acids	10		X	
375-92-8	Perfluoroheptanesulfonic acid	PFHpS	Perfluorosulfonic acids	7		X	
355-46-4	Perfluorohexanesulfonic acid	PFHxS	Perfluorosulfonic acids	6	SynQuest Laboratories	X	
1763-23-1	Perfluorooctanesulfonic acid	PFOS	Perfluorosulfonic acids	8	SynQuest Laboratories	X	
2706-91-4	Perfluoropentanesulfonic acid	PFPeS	Perfluorosulfonic acids	5		X	
4149-60-4	Ammonium perfluorononanoate		Perfluoroalkyl carboxylate salt	9			X