

Specific Environmental Release Categories (SPERCs) for the widespread use of cosmetic products by consumers and professional workers (ERC 8a)

Background Document

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Glossary: List of acronyms and abbreviations

AF	Assessment factor
AISE	International Association for Soaps, Detergents and Maintenance Products
CE	Cosmetics Europe
ECB	European Chemicals Bureau
ECHA	European Chemicals Agency
ERC	Environmental release category
EU	European Union
IGA	German industrial cooperation for aerosol products
PCC	Per capita consumption
REACH	Registration, evaluation, authorization and restriction of chemicals
RF	Release factor
RMM	Risk management measure
SPERC	Specific environmental release category
TGD	Technical guidance document
UK	United Kingdom
WWT(P)	Wastewater treatment (plant)

General disclaimer

SPERCs are **SP**ecific **E**nvironmental **R**elease **C**ategories and are meant to specify broad emission scenario information (Environmental Release Categories (ERCs)). Although specific, SPERCs reflect emissions of a broad application area of a substance within an industry sector. For their purpose, SPERCs are conservative for use in lower tier REACH safety assessments and, therefore, their emission estimates are not intended to reflect all regulatory requirements which may relate to environmental emission thresholds.

1 Statement of purpose

To carry out an environmental exposure assessment, the quantification of the rates of substances released to the environment is key. While ECHA's Guidance R.16 (ECHA, 2016) provides a generic set of release factors, they are less meaningful for several industry sectors, including Cosmetics Europe (CE). Sector organisations have refined the generic ERCs by detailed analysis of the sector's typical operational conditions in order to build SPecific Environmental Release Categories (SPERCs).

Thus, the CE SPERCs refine and specify emission scenario information (through ERCs) for the use of substances in cosmetic products throughout their life cycle (Reihlen et al., 2016). The SPERCs described in this document are specific to the widespread use of cosmetic products by consumers and professional workers. These SPERCs refine the set of generic release factors provided in ECHA Guidance R.16 Appendix 16-1 for environmental release category (ERC) 8a (Widespread use; no inclusion into or onto article; no reaction on use (indoor)) (ECHA 2016). The set of derived release factors (see table 4) is assumed to be applicable as well for reactive ingredients (as used e.g. for certain hair care products) and for outdoor use where applicable; no separate CE SPERCs will be available for these specific conditions.

The SPERC factsheets covered in this document are:

Table 1: Overview on CE SPERCs in scope

CE SPERC Code	Ingredients	Product characteristics*
CE SPERC 8a.1.a	Solid and liquid substances	Widespread use in wash-off products – hair, skin and oral cavity care products (consumers and professional workers)
CE SPERC 8a.1.b	Highly volatile substances	Widespread use in aerosol products for hair and skin care (propellants)
CE SPERC 8a.1.c	Non-volatile substances	Widespread use in aerosol products for hair and skin care (non-propellants)
CE SPERC 8a.1.d	Solid and liquid substances	Widespread use in wipe-off products – make-up, lip and nail care products (consumers and professional workers)

* Typical products and their domains are listed and described in detail in table 2.

2 Scope

2.1 Product types and ingredients

These CE ERC 8a SPERCs are intended to cover cosmetic products which fall within the CE product portfolio; the categories covered and the SPERCs recommended as most relevant for the assessment of their exposure are shown in table 1. According to the European regulation on cosmetic products (Reg. 1223/2009/EC), cosmetic product means any substance or mixture intended to be placed in contact with the external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours. With regard to their application, cosmetic products are categorised by preamble to annexes II to VI of the regulation as either rinse-off products or leave-on products. This classification is made with regard to human safety by identifying the length of time that a consumer is exposed to the product after use. From an environmental release perspective, it has to be considered that most cosmetic products applied to the skin are ultimately washed-off, including most products left on the skin for an extended period of time. Specific leave-on products such as make-up may also be wiped off rather than washed off (e.g. creams, lotions, odour correction, hair care and styling, tanning products). Therefore, CE prefers, for the purpose of these SPERCs, to introduce the environmental safety relevant terms ‘wash-off’ and ‘wipe-off’ rather than the human safety relevant ‘rinse-off’ and ‘leave-on’:

Wash-off: products are removed by water leading to production of waste-water down-the-drain. Aerosol product ingredients that do not evaporate (non-propellant) are generally assumed to be washed off.

Wipe-off: products are removed by the use of solid cloth pads, liquids other than water or some other cleaning agent to mainly produce solid waste by discarding the used pads.

Four SPERC scenarios have been used to cover the environmental release of substances within the portfolio.

SPERC 8a.1.a

is designed to cover products that may finally be washed off even if they remain on the external parts of the human body for a certain while with partial skin absorption.

SPERC 8a.1.d

is applicable for products which are designed as wipe-off products, e.g. decorative cosmetics. A fraction of contained substances will typically be transferred to solid waste when being removed from skin.

SPERCs 8a.1.b and 8a.1.c

are mainly designed to cover aerosol products, to take into account the application route that can result in the release of some substances to the air, during application, e.g. hair style products, shaving products and deodorants, applied by an aerosol can.

SPERC 8a.1.b covers highly volatile substances of aerosol products like propellants (liquified organic gases, carbon dioxide or nitrogen, typical content around 40 % in sprays and 5 % in foams). In this context, highly volatile substances used as propellants are suggested with a boiling point threshold of $\leq 100^{\circ}\text{C}$ (i.e. boiling point of water at standard conditions). Substances like propellants are considered to be immediately released to the air when using those products and thus are not expected to be available for down-the-drain release.

SPERC 8a.1.c covers those ingredients of aerosol products that are not propellants which are not immediately volatilized to the air (boiling point $> 100^{\circ}\text{C}$), even when being considered as volatile organic compounds under other regulations.

For SPERCs 8a.1.a, 8a.1.c and 8a.1.d, ingredients are not differentiated with regard to their volatilization properties as the impact on emission to air is negligible, so they are considered to be available for down-the-drain release.

As shown in table 2, all four SPERCs may be appropriate for substances used in cosmetic products with different modes of application. Hence, the appropriate SPERC should be chosen based on product use and application and on volatility of the substance.

Table 2: CE product description and corresponding SPERCs

Domain (chosen from CE SPERC ERC 2 on formulation)	Product description	Examples	CE SPERC			
			8a.1.a – Wide-spread use in wash-off products – hair, skin and oral cavity care products	8a.1.b – Wide-spread use in aerosol products (propellants)	8a.1.c – Wide-spread use in aerosol products (non-propellants)	8a.1.d – Wide-spread use in wipe-off products – make-up, lip and nail care products
Liquid products, low viscosity	Cleaning products (surfactant-based, water-soluble, low viscosity)	Foam bath, shampoo, shower gel, washing lotion, foot bath, make-up remover (wash-off)	✓			
		Make-up remover (wipe-off)				✓
	Liquid care and styling products for skin, hair, face, hands or feet (oil-in-water or water-in-oil emulsions or gels, water-soluble or water-miscible,	Skin lotion/milk, cleaning emulsion (wash-off), shower emulsion/oil, two-phase bath, after-shave balm, hair conditioner, sunscreen lotion/gel*, after-sun, self-tanning lotion, hair styling lotion/gel	✓			
	Cleaning emulsion (wipe-off)				✓	

Domain (chosen from CE SPERC ERC 2 on formulation)	Product description	Examples	CE SPERC			
			8a.1.a – Wide-spread use in wash-off products – hair, skin and oral cavity care products	8a.1.b – Wide-spread use in aerosol products (propellants)	8a.1.c – Wide-spread use in aerosol products (non-propellants)	8a.1.d – Wide-spread use in wipe-off products – make-up, lip and nail care products
	low viscosity range)					
	Liquid care and styling products in form of aerosol spray or foam	Propellants, used in: hair conditioner spray, hair styling spray, deo spray, shower mousse, shaving balm, sunscreen foam		✓		
		Non-propellants, used in: hair conditioner spray, hair styling spray, deo spray, shower mousse, shaving balm, sunscreen foam			✓	
Liquid alcohol-borne products (cleaning with water)	Alcohol-borne solutions (water-soluble, low viscosity	Toner, fragrances, perfumes, pre-shave, after-shave, shaving lotion, shaving gel, hair tonic, deep hair conditioner, setting lotion, deodorant/deo gel	✓			
Cosmetic products, high viscosity	Liquid care and styling products (oil-in-water or water-in-oil emulsions or gels, water-soluble or water-miscible, high viscosity range)	Liquid soap formulation, liquid tooth-paste, shaving gel, hair colour products, hair-styling cream, deodorant stick	✓			
		Emulsion make-up, eyeliner				✓
Non-liquid creams	Creams (emulsions or emulsifier containing)	Tooth paste, face cream, skin cream, nail care cream, sunscreen cream*, self-tanning cream, hair wax, hair gel, hair gum, depilation cream, foot balm	✓			
		Make-up foundation, lip salve, eye foundation cream, mascara				✓

Domain (chosen from CE SPERC ERC 2 on formulation)	Product description	Examples	CE SPERC			
			8a.1.a – Wide-spread use in wash-off products – hair, skin and oral cavity care products	8a.1.b – Wide-spread use in aerosol products (propellants)	8a.1.c – Wide-spread use in aerosol products (non-propellants)	8a.1.d – Wide-spread use in wipe-off products – make-up, lip and nail care products
Cosmetic products involving cleaning with organic solvents	Products based on oils, grease, wax and other non-water-soluble substances	Oil bath, skin care oil, sunscreen oil, sunscreen stick, hard skin remover, fragrances, perfumes (ingredients other than alcohols), hair wax (pomade), epilation wax, foot balm, foot deo	✓			
		Cream make-up, eyebrow stick, lip stick, lip gloss, lacquer, kajal, water-proof decorative cosmetics, varnish remover				✓
Solid cosmetic (and home care) products**	Soaps (sodium or potassium salts of fatty acids), syndets (synthetical detergents)	All kinds of soap, including solid form shampoos, shaving soap	✓			
Solid cosmetic (and home care) products**	Powders (dispersible in water)	Foot powder, bath salt, dental powder, dental prosthesis cleaner, henna products	✓			
		Powder make-up, rouge, eye shadow				✓

* All products covered by SPERC 8a that will be completely or partially washed-off will lead to down-the-drain emissions. Thus, CE SPERCs therefore only cover release to the aquatic environment via down-the-drain emissions. Direct releases of e.g. sunscreen products that are partly released at places where there is no sewage treatment are beyond the scope of these SPERCs (e.g. when swimming or plashing at a river, a lake or at the seaside). For these products the fraction directly released must be assessed by other models.

**As this is a joint SPERC with AISE, home care products are covered but not being considered as cosmetic products

3 Emission relevance of operational conditions

Besides product intrinsic properties (volatility of ingredients), the mode of application and, to a certain extent, the behaviour of users have an impact on emission routes.

All products considered within the scope of SPERC 8a.1.a and SPERC 8a.1.c are assumed to be washed-off the body with water directly or - if taken up by clothes - during the laundry, and will therefore be disposed of with waste water. Substances assessed under SPERC 8a.1.a and SPERC 8a.1.c are expected to be applied without relevant volatilization during use.

SPERC 8a.1.c covers non-volatile ingredients of products that are applied by aerosols to the human body. Their majority is expected to be deposited on the body for a while and will be washed off later and released to waste water finally.

SPERC 8a.1.b covers highly volatile substances of aerosol products (i.e. the propellants) which instantly evaporate to the air during use. They are assumed to be not disposed with waste water.

Substances assessed under SPERC 8a.1.d may be either washed off from skin or wiped off by solid pads, tissues or sponges. Pads and tissues for single use are then mainly disposed of as waste. Re-usable tissues and sponges may be cleaned by washing leading finally to a release to waste water. It is also known that a minor part of pads and tissues is flushed-off by consumers and their content is thus also released to waste water.

4 Application of risk reduction measures

As per ECHA Guidance document R16, chapter R.16.2.2.4 'Conditions of Use', no additional risk reduction measures are applicable for widespread uses by consumers and professional workers other than municipal wastewater treatment (WWT) set as default for releases to wastewater.

5 SPERC information sources and justification

5.1 Justification of use rates

The default procedure for the estimation of tonnages for widespread uses is given in the ERCs contained within R.16.2.2.1.2 of ECHA Guidance R.16 (ECHA 2016). Herein the default 'fraction of EU tonnage used in region' ($F_{\text{prodregion}}$) is 0.1, or 10 %. The default 'fraction of regional tonnage used locally' ($F_{\text{mainsource}}$) is 0.002, or 0.2%. This default is calculated by the following equation:

$$F_{\text{mainsource}} = \frac{\text{Population connected average sized WWTP}}{\text{Population in hypothetical region}} \times AF$$

The applied model defines that the population connected to an average sized wastewater treatment plant (WWTP) is 10,000 and the population in a hypothetical region is 20,000,000. In addition, a default assessment factor (AF) of 4 is applied to take account of potential local variations in widespread uses in time and space. Table R.16-6 in ECHA Guidance R.16 (ECHA 2016) states: 'Registrants can overwrite this value, for example, if they have sufficient information to demonstrate that the use of the substance is evenly distributed in space and time throughout the region (e.g. for detergents)'. Both, $F_{\text{prodregion}}$ and the AF, are matter of refinement in these SPERCs.

5.1.1 Refinement of $F_{prodregion}$

Within all CE SPERCs defined under ERC 8a, the fraction of European Union (EU) tonnage used in a region is set to 0.053 (5.3 %) as opposed to the default of 0.1 (10 %) set within ECHA Guidance R.16 (ECHA 2016). This revision is based on an empirical/statistical work performed by Price et al. 2010.

Price et al. presented an approach that allows the coupling of population density and country-specific usage statistics for a range of personal care products (i.e. skin, hair, oral, lip, nail care etc. products). Spatially explicit usage estimates were generated for hypothetical EU regions (200 × 200 km grid, inhabited by 20 million people). Recent sales and population density data were combined to assess the relevance of the default assumption. The results of this analysis suggest that environmental exposure distribution estimates for ingredients used in cosmetic products are not at “representative worst-case” level. $F_{prodregion}$ is usually lower than 10%.

For the study, the consumption pattern of four large types of cosmetic product categories, representing more than 95 % of all cosmetic products used inside the EU, were assessed (hair care, oral care, deodorants, skin care). The average per capita use for the default region containing 20 million people, as a proportion of the total EU27 (then including United Kingdom (UK), plus Croatia, Norway and Switzerland) was derived for each product type. An inter-country analysis was performed that identified two primary regions (out of more than 100) in the EU27+3 with maximum use of home and personal care products (UK and a transboundary region). EU regions containing 20 million people had maximum product usage (99.5th percentile) representing only 4.6 to 9.0 % of the total EU product volume for the four product types (as shown in Table 3) with the mean per capita consumption (PCC) typically about a factor or two lower than the maximum country PCC (only for deodorants, the maximum PCC in a country is much higher than their mean).

The weighted average of the 99.5th percentile over all analysed cosmetic product types ($F_{prodregion}$) was calculated to be 0.053 (as shown in Table 3). This is deemed sufficiently conservative and appropriate to provide a generic refinement to ERC 8a for chemicals used over all cosmetic product types.

Table 3: Usage statistics for substances used in cosmetic products (according to Price et al., 2010)

Product type	Mean PCC across EU (mL/cap/yr)	Maximum PCC per country (mL/cap/yr)	Maximum product usage in region $F_{prodregion}$ (99.5 th ile)	% Ratio of total use of cosmetics	Weighted contribution
A	B	C	D	E	F = D x E
Hair care	1013	1744 (Norway)	0.0464	35.57	0.0165
Oral care	350	740 (UK)	0.0597	12.29	0.0073
Skin care	1256	2589 (Spain)	0.0494	44.10	0.0218
Deodorants	229	828 (UK)	0.0904	8.04	0.0073
Weighted average for cosmetic products ($F_{prodregion}$)					0.0529

PCC: per capita consumption according

5.1.2 Refinement of the local variation AF and calculation of $F_{\text{mainsource}}$

For a local risk assessment, a default factor of 4 is generally applied to the per capita consumption to take into account geographical or temporal peaks (e.g. night-day, behavioral). For high production chemicals in cosmetics the European Chemical Bureau's Technical guidance document (ECB TGD) (ECB 2003; cf. table B4#) already diminished this variability completely to a factor of one by realising that wide-spread consumer uses of products such as cosmetics and detergents occur with much less variability, this would result in a less conservative $F_{\text{mainsource}}$ of 0.0005.

For the purpose of these SPERCs, a more conservative approach is taken based on the work by Fox et al. (Fox et al. 2002) who measured influent concentrations of boron from 48 WWTPs within the UK, Germany, Italy and the Netherlands. At that time boron was a common ingredient in detergents. Being inert to degradation and absorption, boron was chosen as a representative marker for environmental monitoring. Freights of boron indicated that 90 % of the WWTPs never received more than 1.5 times of the average predicted boron input by applying regional detergent sales volumes.

As discussed further in Price et al. (Price et al. 2010), the default assessment factor of 4 is considered overly conservative and it has been deemed appropriate that an assessment factor of 1.5 provides a 'reasonable worst case' for all down-the-drain products (including cosmetics). Moreover, Fox et al. could not draw correlations between the local and regional variations of product consumption. Hence, the factor of 1.5 appears to be applicable to local situations of all regions in the EU. This approach has been adopted by CE for cosmetic products in scope of these ERC 8a SPERCs.

Using an assessment factor of 1.5 instead of 4 means $F_{\text{mainsource}} = 10,000 / 20,000,000 * 1.5 = 0.00075$. Therefore, for the purpose of the SPERCs defined in this document the 'fraction of regional tonnage used locally' ($F_{\text{mainsource}}$) has been set to 0.00075.

5.2 Justification of days emitting

The days emitting for each SPERC are set to 365 as per ECHA Guidance R.16, chapter R.16.2.2.1.2, 'Estimation of tonnage for widespread uses' (ECHA 2016). For widespread uses, the assumption is that products could be used by consumers all year round, 365 days a year. The same applies for professional use; even though individual enterprises may limit their releases to 250 days a year, the overall use pattern across EU leads to the expectation of a contribution on each day of a year.

5.3 Justification of release factors

5.3.1 Water, air, sediment and soil

The release factors presented in Table 4 are based on the generic release factors provided in the ECHA Guidance R.16 Appendix 16-1 for ERC 8a (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)) (ECHA 2016). The default ERC values for 8a assume a 200 % release; 100 % into water and 100 % into air. Here, four SPERCs have been provided to offer a greater degree of specificity depending on the use and physical-chemical properties of an individual ingredient. SPERCs 8a.1.a and 8a.1.c for wash-off products and non-volatile/non-propellant substances assume 100 % release to water only. SPERC 8a.1.b, on the other hand, was created to account for products emitting highly volatile substances to air, covering substances that will not deposit immediately. SPERC 8a.1.b therefore assumes 100 % release to the air compartment. Besides these three SPERCs, SPERC 8a.1.d has been introduced to enable a more distinguished assessment for make-up, lip and nail.

ECHA's report on the microplastics restriction proposal (ECHA, 2019) cites the Kantar TNS consumer survey performed on behalf of CE which specifically focussed on the removal and disposal of leave-on products including make-up, lip and nail products (2018 online survey with 8000 adults in UK, France, Germany, Italy, Netherlands, Poland, Spain and Sweden; Kantar 2018). This study revealed that the percentage of consumers washing off (or using cotton wool/pads that were later disposed of in toilet) for make-up (incl. lip) was 28% and for nail varnish/remover was 18%. Consequently, assuming a conservative approach, water and waste releases for CE SPERC 8a.1.d (make-up, lip and nail products) can be estimated at 0.3 and 0.7, respectively.

5.3.2 Waste

The percentage of a product released to waste is required as part of the SPERC factsheet format published in 2016 and may have implications for lifecycle assessment and legislation around the handling of waste but not on the risk assessment of the substance.

For cosmetic products, there are two aspects to be taken into account:

- Product residues in various types of packaging and dispensers (all SPERCs), and
- Wipe-off products removed by using pads and tissues which end up in waste (SPERC 8a.1.d).

Product Residues

In this context, waste is defined as the amount of product that remains in packaging at the end of typical consumer product use, for example, product residue left in a bottle. The percentage of material remaining in each package after the use phase can be calculated as follows:

$$\% \text{ Product waste residue} = \frac{W1 - W2}{W3} \times 100$$

W1 = average weight of emptied package (emptied package = package + cap/nozzle + residual product) (g)

W2 = average net-weight of the "unused" empty package + cap/nozzle (g).

W3 = average net weight of content. The net weight of content is the quantity of product poured into the empty package, as declared on the label (g).

An exercise was performed by AISE, the detergents industry sector organisation, to define a representative range of waste values appropriate for the majority of the products covered by their SPERCs for ERC 8a (AISE 2020). Due to similarity of many products with regard to product properties (e.g. viscosity), this exercise was seen as an appropriate reference to some cosmetic products.

Depending on the product and bottle type and its phys-chem properties, the values for the waste residues ranged from 0.13 to 3.118 % for liquid products (liquid detergents like laundry detergents, fabric finisher, fabric conditioner, liquid detergent gels, cleaner gels (WC, bathroom, etc.) and hand dishwash, liquid cleaners and cleaner trigger sprays like floor cleaner, all-purpose cleaner, bathroom cleaner, kitchen cleaner, window cleaner, liquid WC-rim, limescale removers). CE considers the results of the AISE exercise as a valid reference for liquid products with low viscosity. These products amount to about two thirds of the whole product portfolio by volume. Due to lower average packaging sizes and a broader variety of packaging units, the estimated values are increased towards 1-5 %. According to an earlier expert judgement by TÜV Rheinland on behalf of the German aerosol organisation IGA, these values are also applicable for residues in aerosol cans (IGA 1994). According

to expert judgement of CE member companies, the same values apply for solid cosmetic products (soaps and powders).

Cosmetic products with high viscosity and non-liquid creams may be supplied in boxes with large lids which allow to extract almost all of the contained products. On the other hand, products may be supplied in dispensers or in tubes (e.g. for toothpaste) which do not enable full exploitation. Taking both extremes into account, CE considers 5 % residue as an appropriate maximum figure. This is also in line with ECHA's assumption on cosmetic product residues in packaging as outlined in ECHA's report on the restriction for microplastics (ECHA 2019, section 1.4.2.3).

Waste of wipe-off products when being removed by using pads and tissues

SPERC 8a.1.d has been introduced to enable a distinguished assessment for decorative make-up and nail varnish. According to above cited (see 5.3.1) Kantar TNS study on behalf of CE in 2018 (Kantar, 2018), 72% of make-up products (incl. lip) and 82% of nail products are removed using pads and tissues with subsequent waste disposal. Considering those figures under a conservative approach, a 70% release of make-up, lip and nail to waste can be assumed. In addition, 0-5% of product residues can be assumed for the package.

5.3.3 Summary of release factors

Table 4 summarizes all release factors (RF) of the CE SPERCs on widespread uses. For derivation of the RF to waste, CE SPERC 8a.1.d considers a combination of product residues in packaging and removal of cosmetic products by using pads and tissues.

Table 4: Summary of release factors for the widespread use of cosmetic products

Release factor	8a.1.a - Widespread use in wash-off products – hair, skin and oral cavity care products	8a.1.b - Widespread use in aerosol products (propellants)	8a.1.c - Widespread use in aerosol products (non-propellants)	8a.1.d - Widespread use in wipe-off products – make-up, lip and nail care products
To air	0%	100%	0%	0%
To water	100%	0%	100%	30%
To soil	0%	0%	0%	0%
To waste	1-5%	1-5%	1-5%	70-75%

After product use, 70% of the formula are estimated to go to waste with product residues of 0-5% accounting for product residues in the package.

5.4 Justification of risk reduction measures¹

No Risk Management Measures (RMMs) are applicable for these SPERCs. RMMs are understood as on-site measures for the reduction of releases to an environmental compartment. Effluent water from use of cosmetic products is supposed to undergo waste water treatment at municipal WWTPs. The efficiency of WWTPs is not in scope of SPERCs.

6 Conservatism

The use rates identified in this background document and reported in the relevant SPERC factsheets are based on the subject matter expertise of CE members in addition to peer reviewed scientific publications. Release factors were chosen in a conservative manner (100 % release in most cases), since the product uses are taking into account typical release routes into the environment linked to the foreseeable uses.

The $F_{\text{prodregion}}$ and $F_{\text{mainsource}}$ for the regional and local exposure assessment have been revised in a conservative manner. For the $F_{\text{prodregion}}$ this was done by using the weighted average of maximum regional use rates (99.5%iles) of cosmetic products to derive a reasonable worst-case figure. This $F_{\text{prodregion}}$ is considered inherently conservative as it is based on product type usage and not on substance usage. It is assumed that all products of a type would use a similar kind of ingredients. The $F_{\text{mainsource}}$ was altered by the adjustment of the AF which accounts for spatial and temporal fluctuations of cosmetic product use found by Fox et al. (Fox et.al. 2002). By these approaches a two-fold worst-case representation of the widespread emissions of cosmetic products is reached.

¹ Note that certain sunscreen products when not discharged down-the-drain (e.g. when swimming or plashing at a river, a lake or at the seaside) are not covered.

In combination, the values provided are considered to be a reasonable worst-case scenario for input into exposure assessments.

As an additional aspect, the UK leave of the EU may be assessed. According to Price et al., UK had one of the two highest impact regions and usage figures much about average for two out of four product types (oral care, deodorants) (Price et al. 2010). So, the spatial fluctuation should actually be lower now in practice.

7 Applicability of SPERCs

7.1 Tiered assessment

Due to the characteristics described above, we consider the widespread use of cosmetic products SPERCs to be suitable for use in standardised, lower tier REACH assessments of the vast majority of their ingredient substances. Their envisaged use is for risk assessors to distinguish trivial substances and emission situations from problematic ones based on standardised emission estimates. Based on this distinction, efforts can be focused on further (higher tier) assessments and refinement of problematic issues.

7.2 Regional assessment

In view that that there is very limited regional variation in the widespread use of cosmetic products, SPERCs may be applicable for emission estimation of the widespread use of cosmetic products across the EU.

8 References

- AISE 2020, Specific Environmental Release Categories (SPERCs) for the widespread use of household care and professional cleaning and hygiene products - Background Document. Brussels, July 2020
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