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A Draft Concept for estimating the Environmental Release of Synthetic Polymeric Microparticles from Products (E-calc_SPM)

Background

In 2023 the Commission put a restriction on "Synthetic Polymer Microparticles" (SPM) into force, laid down in entry 78 of Annex XVII of the REACH Regulation, as introduced by Commission Regulation (EU) 2023/2055 (COM 2023). The restriction entails a ban on the placing on the market of all polymers that meet the SPM definition unless their specific use is derogated from the ban. Derogations from the ban on the placing on the market for certain cases exist where using the SPM or the product containing them does not release SPM, or those releases can be prevented/minimised; or to avoid overregulation of certain uses and sectors. For those derogated uses the restriction lays down requirements for suppliers to provide instructions on how to handle and dispose the (SPM in the) product to prevent or minimise the SPM loss to the environment (the Instructions for Use and Disposal –"IFUD") and for reporting to ECHA on estimated environmental release of SPM , to monitor the effectiveness of IFUD and the restriction in general.

Objective

This paper addresses a generic approach for suppliers of SPM and SPM-containing mixtures, the "E-calc_SPM", on how to estimate environmental release of SPM. The approach is based on emission estimations of specific Environmental Release Categories (SPERCs) as developed by several downstream user associations for relevant steps of chemical substances during the substance life cycle. Following the SPERCs approach, the E-calc SPM has a large applicability domain and is also based on conservative worst-case assumptions (Tier 1.5) which may lead to an overestimation of the release of SPM into the environment. Further emission pathways to water and soil are assessed by statistical evaluation of sewage treatment connectivity and sludge disposal practices throughout Europe. However, it is acknowledged that due to the generic approach followed, there may be situations where an individual assessment may be more appropriate.

Scope

The definition of SPM refers to polymers with certain properties (solid, insoluble, non-biodegradable and synthetic). As additional conditions, the corresponding polymer(s) must be part of a particle with certain dimensions. Only those solid, insoluble, non-biodegradable and synthetic polymers that make up at least 1% by weight of particles with the corresponding dimensions or form a continuous surface coating on these particles are to be regarded as SPM and only this polymer content is to be taken into account in the quantification and reporting obligation.

When assessing whether a mixture is subject to the SPM restriction, the 0.01% limit specified in paragraph 1 applies. When assessing whether this limit value of 0.01 % is exceeded, the sum of the solid, insoluble, non-biodegradable and synthetic polymers that are part of a particle with the specified dimensions (i.e. SPM in a particle) must be taken into account. Non-polymeric components of the particles and polymers that do not fulfil the SPM criteria do not have to be taken into account for reporting.

The generic approach of Environmental Emissions

The emission estimation of SPMs is based on two use-specific emission scenarios:

a. Emissions from use processes. The estimation of environmental emissions from a substance life-cycles is part of the risk assessment during the REACH registration process. Default exposure scenarios / environmental release categories (ERC) exist, that can be revisited by developing more realistic emission scenarios with revised environmental release factors (i.e. factors expressing the fraction of the amount of chemical used that is emitted to air, soil, or water). In this regard, downstream user associations, such as the Association of the European Adhesive & Sealant Industry (FEICA) and the European Federation for Construction Chemicals (EFCC) have developed specific environmental release categories (SPERCs) that have been published as part of the downstream user use map approach under REACH (e.g. Reihlen *et al.*, 2016, Tolls *et al.* 2016). The publication of SPERCs include a thorough background documentation that demonstrates a broad applicability domain as well as its conservative approach by deriving realistic emission estimates. The SPERC elements are documented on the ECHA webpage under the use map library (ECHA 2024). The first aspect of the E-calc_SPM is the application of the SPERCs emission scenarios' release factors into the environment.

b. Further reduction of emissions by waste water treatment. The SPERCs release factors reflect the generic emission after use in each life cycle step, i.e. without the consideration of further risk management. Therefore, a potential emission reduction by sewage and subsequent sludge treatment is assessed as the subsequent aspect of the E-calc_SPM concept. The retention of SPM depends on the type of sewage treatment and the size of the SPM investigated. The RAC reported mean SPM wastewater treatment retention factors between 80-99.2%, depending on the type of treatment (RAC 2019). In addition, country specific data from on the proportion of wastewater treatment per country and sludge disposed of via different routes: agriculture/horticulture, composting, landfill, and incineration, has been assessed. Based on these data a weighted average fraction has been calculated for wastewater treatment connectivity in the EU and the fraction of sludge that may enter the environment as fertilizer e.g. in agriculture or composting. The calculation is based on the population per country and the country specific attribution to wastewater treatment and sludge incineration and landfill vs. agriculture and composting.

The concept of emission calculation is laid down in the following graph:

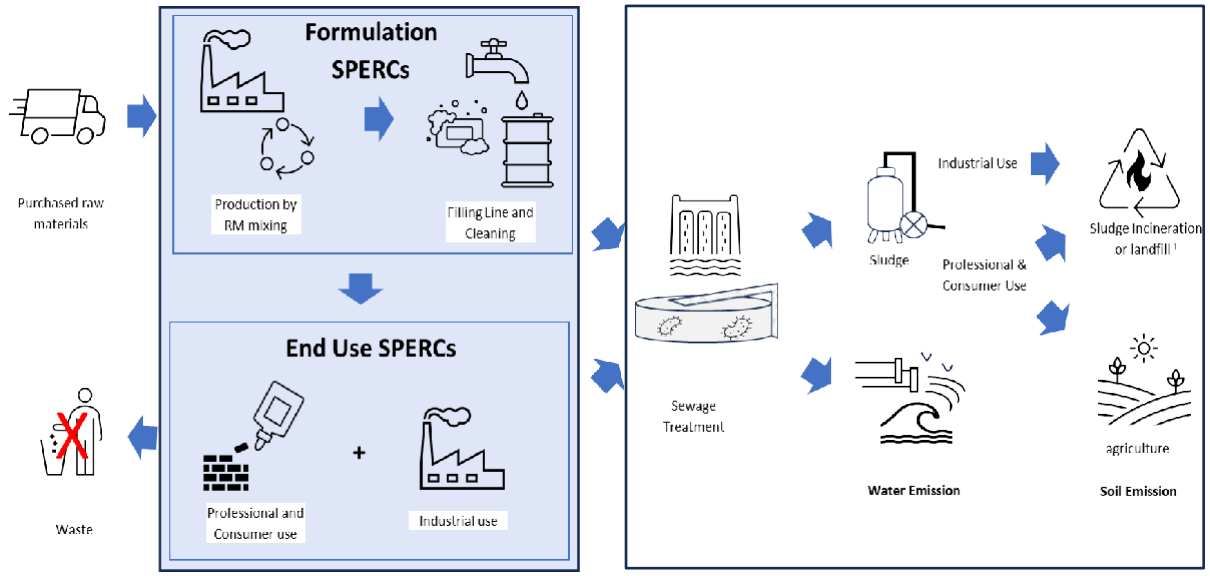

Figure 1: Graphic layout of the generic emission calculation of Synthetic Polymeric Microparticles (SPM) from products (E- calc_SPM). Environmental releases during formulation and end uses as calculated by SPERC release factors (shaded box) are amended with emission reduction of SPM during sewage treatment and subsequent sludge treatment (clear box). Note that while industrial sludges are incinerated, domestic sludges can partly be used as landfill. Waste emissions are considered to not contribute to environmental emissions in the EU. ([1] Sludge disposal to incineration or landfill = without emissions to soil and air)

The EU sewage sludge directive (Council Directive 86/278/EEC) sets narrow limits for the use of industrial sludge in agriculture. In practical consequence, the emission of sludge to fields is continuously decreasing, especially from industrial sources. However, because we could not find data on the fraction of incinerated industrial sewage sludge, the emission numbers do not discriminate between sludge sources. This may result in conservative estimates and industrial users of the concept can refine with their specific conditions (i.e. no sludge to soil) where appropriate.

Environmental Emissions of SPM according to the E-calc_SPM concept

The emissions of SPMs are calculated according to concept described. Its practical application is based on the product use as described by the relevant SPERC description (cf. Table A-1).

The overall generic environmental emission estimation of SPMs for uses during the different steps in the supply chain is depicted in table 1. Due to specific environmental releases of different product types each SPM emission has to be calculated per appropriate use (SPERC 1-8). Actors subject to the SPM restriction obligation must identify their relevant uses from Table 1 and determine the resulting SPM emissions for each of the different uses separately for the reporting to ECHA and per legal entity.

Because all SPERCs in table 1 indicate emissions to air and water only, the emission to soil is considered secondary via sludge disposal from WWTP treatment. After multiplication of SPERC emission factors

and WW removal, the following simple calculation can be performed for each use (n) to calculate individual SMP-emissions:

(eq. 1): $E_{SPM(SPERC)} = [Tonnage_{SPM\text{-}containing\ product(SPERC/a)} \times c_{SPM\ product}] \times F_{SPM\_Ecalc\_env\ (SPERC)}$

where:

$E_{SPM(SPERC)}$	= the total emissions tonnage of SPM per use according to one SPERC per year	[t/a]
$Tonnage_{SPM\text{-}containingd\ product\ (SPERC/a)}$	= the SPM-containing product use tonnage per use as defined under one SPERC per reporting year	[t/a]
$c_{SPM\ product}$	= concentration of SPM-polymer in SPM-containing product	[%]
$F_{SPM\_Ecalc\_env(SPERC)}$	= generic emission fraction of released SPMs to the environment per SPERC use	[%]

The generic emission factor ($F_{SPM\_Ecalc\_env\ (SPERC)}$) depends on the RF of the applicable SPERC and the release fraction (F) of SPM to water and soil and constitutes of:

(eq. 2) $F_{SPM\_Ecalc\_env(SPERC)} = F_{SPM\_Ecalc\_water} + F_{SPM\_Ecalc\_soil}$

with:

$F_{SPM\_Ecalc\_water} = RF(water)_{SPERC} \times SPM_{cum\_water}$ *and*

$F_{SPM\_Ecalc\_soil} = RF(water)_{SPERC} \times SPM_{cum\_soil}$

where :

SPM_{cum_water}	= release fraction of SPMs to surface water *(% wastewater disposal x (1-%SPM reduction in WW) = 13.2%; cf. table A-2)*	[%]
SPM_{cum_soil}	= release fraction of SPMs to soil via sludge application *(% SPM emission to sludge x $f_{agriculture}$ = 46.3%; cf. table A-2)*	[%]
$f_{agriculture}$	= the fraction of sludge that leads to emissions to soil via fertilizer use to fields or compost	[%]
$RF(water)_{SPERC}$	= the generic release factor of emissions to water for each SPERC (cf. table A-1)	[%]

The fraction of sludge from STPs that leads to the emission of SPM in soil (fagriculture) in the EU is the weighted mean of sludge disposal per country to agriculture and compost as derived from EUROSTAT (2025).

Eq. 1 provides the generic emission estimation per SPM tonnages used under the applicability domain of one SPERC. It applies a generic SPM emission factor to the environment that is based on the weighted EU-mean of wastewater connectivity combined with its SPM-removal efficiencies of the respective degree of WWTP sophistication level in the EU. Because the picture of these parameter may differ significantly between countries in the EU optional calculation of SPM emissions may be conducted for single countries. For this reason, we provide detailed information on the sewage treatment situation in the 27 EU countries (see annex 2; data from Eurostat, 2025).

The overall release factor "$F_{SPM\_Ecalc\_env}$ (SPERC)" can be applied to estimate average emissions to the environment per use. As shown in eq.1, however, perquisition to this calculation is a good knowledge on SPM uses in different product categories – e.g. water- vs. solvent-borne products. The main uses per SPERC are depicted in Annex 3 of this report.

Table 1: Generic look-up table on emissions of SPM to water, air and soil according to the E-calc_SPM concept (F = formulation, I = industrial use, W = wide-spread use by end consumer and professional users).

Life cycle step	Use description (acc. to SPERCs)	SPM to water $F_{SPM\_Ecalc\_water}$	SPM to soil $F_{SPM\_Ecalc\_soil}$	**SPM to environm. $F_{SPM\_Ecalc\_env}$ (SPERC)**
		(eq2)	(eq2)	(eq.1)
F	**1. Formulation of SPM in Solvent-borne and Solvent-less Adhesives / Sealants and Construction Chemical Products**	0.0026%	0,0093%	0,0119%
	2. Formulation of SPM in Water-borne Adhesives / Sealants and Construction Chemical Products	0.0668%	0,2339%	0,3007%
	3. Formulation of SPM in Cementitious Construction Chemical Products and Tile Adhesives	0.000%	0.000%	no emission
I	**4. Industrial use of SPM Solvent-borne and Solvent-less Adhesives / Sealants**	0.000%	0.000%	no emission
	5. Industrial use of SPM of in Water-borne Adhesives / Sealants	0.0397%	0,1389%	0,1786%
W	**6. Widespread use of SPM in adhesives / sealants - indoor**	0.1984%	0.6947%	0.8931%
	7. Widespread use of SPM in Adhesives/Sealants and Construction Chemical Products - outdoor	0.1984%	0.6947%	0.8931%
	8. Widespread use of SPM in construction chemical products - indoor	0.1984%	0.6947%	0.8931%

* note: sludge generation from industrial uses is assumed to undergo incineration and will not contribute to the calculation of SPM emissions for these life cycle steps.

Summary and Conclusion

A concept for the generic derivation of environmental release estimation for SPM "E-calc_SPM" is presented. The application of SPERCs from the Adhesive and Sealants Association (FEICA) and the European Federation for Construction Chemicals (EFCC) for the relevant downstream uses (formulation, industrial and professional/consumer) enable a generic estimation of SPM releases from the use as such and from products into the environment. The generic calculation of environmental releases by different product uses lead mainly to emissions to water that subsequently entering sewage treatment. The sewage treatment situation has been assessed throughout Europe by using data from EUROSTAT (2025). In the EU, the majority of the sewage (88%) is treated by wastewater treatment plants (WWTPs). Because the different level of wastewater treatment sophistication trigger different efficiencies on SPM removal, the "E-calc_SPM" takes the EU-weighted average of sewage treatment situations for each country into account. Due to the lack of biodegradation a majority of SPMs will accumulate in sewage sludge, where WWTP extension degree is high. Vice versa a low degree of sophistification renders a higher SPM fraction to the surface waters. The subsequent pathways of sewage sludge disposals have been analysed and the emission reductions due to sludge incineration and landfill have been attributed to environmental SPM emissions leading to a emission reduction of SPMs into the environment by roughly 40% in the EU mean.

Overall, the E-calc_SPM concept provides a generic emission estimation method for derogated SPM uses of adhesives, sealants and construction chemical products. For the applicability domain of each SPERC one distinct emission fraction "***FSPM_Ecalc_env (SPERC)***" is derived that enables an easy to apply calculation for SPM emissions into the environment. Due to its broad applicability domain, the calculation is very conservative and considered for a Tier 1 screening. Because it can overestimate real SPM emissions, refinements can be amended, where more detailed data is available.

Annex 1 – Details on the calculation of emission factors of the E-calc_SPM

This Annex provides detailed information on the E-calc_SPM concept and options for refined regional release estimations.

Specific Environmental Release categories

The core refinement element of SPERCs with regard to environmental exposure is the revision of the overly conservative release factors of Environmental Release Categories (ERCs) during each relevant life cycle step (Saettler *et al.* 2012; Reihlen *et al.* 2016). A list of these refined release factors (RF) for adhesives, sealants and construction chemical products is depicted in table A-1. Since SPMs are per definition solid, water insoluble particles they are considered by the respective SPERCs for non-volatile substances. Considering the SPMs as product ingredients in Adhesives and Sealants their emission pattern differ between water-based or solvent-based products during formulation and industrial uses, mainly because the cleaning steps after the application of industrial settings is driven by the wash agents used. For solvent-based adhesives, wash-solvents are usually disposed of as chemical waste - together with diluted and/or solid ingredient residues- that is incinerated by third parties, while water is used for cleaning of vessels of water-based adhesives, leading to potential water emissions. Finally, the environmental emissions during wide-spread end-uses for products within the applicability domain of FEICA and EFCC is determined mainly by their application "indoor" or "outdoor". Therefore, the SPERCs for products used by professional users and end-consumers are divided into these categories.

Table A-1: Environmental release factors for products falling under the portfolio of FEICA and EFCC as reflected by SPecific Environmental Release Categories (SPERCs). The scenarios reflect the relevant life cycle steps of formulation (ERC 2), industrial use (ERC 5) and wide spread use by professionals and consumers (ERC 8).

SPERC Code	SPERC description	ERC	Release fraction to air $RF(air)_{SPERC}$	Release fraction to waste water $RF(water)_{SPERC}$	Release fraction to soil $RF(soil)_{SPERC}$	Release fraction to waste $RF_{(waste)SPERC}$	Reference
FEICA / EFCC SPERC 2.1a.v3	**Formulation of Solvent-borne and Solvent-less Adhesives / Sealants and Construction Chemical Products - non-volatile Substances**	2	0.08%	0.02%	0.00%	0.2 -3%	FEICA / EFCC (2017)
FEICA / EFCC SPERC 2.2b.v3	**Formulation of Water-borne Adhesives / Sealants and Construction Chemical Products – non-volatile Substances**	2	0.0097%	0.505%	0.00%	0.2 -3%	FEICA / EFCC (2017)
FEICA / EFCC SPERC 2.3a.v1	**Non-volatile Substances for the Formulation of Cementitious Construction Chemical Products and Tile Adhesives**	2	0.005%	0.00%	0.00%	0-1%	FEICA / EFCC (2017)
FEICA SPERC 5.1a.v4	**Industrial use of non-volatile Substances in Solvent-borne and Solvent-less Adhesives / Sealants**	5	1.70%	0.00%	0.00%	0-6%	FEICA (2022)
FEICA SPERC 5.1c.v4	**Industrial use of non-volatile Substances in Water-borne Adhesives / Sealants**	5	1.70%	0.30%	0.00%	0-6%	FEICA (2022)

FEICA SPERC 8c.3.v3	**Widespread use of non-volatile substances in adhesives / sealants - indoor**	8c	0.00%	1.5%	0.00%	4-25%	FEICA / EFCC (2018)
FEICA/ EFCC SPERC 8f.1a.v2	**Widespread use of non-volatile substances in Adhesives/Sealants and Construction Chemical Products - outdoor**	8f	0.00%	1.5%	0.00%	4-25%	FEICA / EFCC (2018)
EFCC SPERC 8c.1a.v 2	**Widespread use of non-volatile substances in construction chemical products - indoor**	8c	0.00%	1.5%	0.00%	4-25%	FEICA / EFCC (2018)

The release factors in table A-1 indicate that environmental emissions of non-volatile substances lead mainly to the water compartment (RF(water)SPERC) while emissions to soil (RF(soil)SPERC) are zero. The low environmental release to air (RF(air)SPERC) as indicated by some SPERCs for industrial uses (incl. formulation) would be neglected for the SPM emission due to control measures for dusts at industrial sites controlling air releases of particles. Finally, there are zero air emissions determined during wide- spread uses of relevant products. The release factors addressed to waste (RF(waste)SPERC) are due to product residues in product container, that are assumed to be controlled by proper waste management. They do not contribute to environmental releases of SPMs.

Data on Sewage Treatment and Sludge Application

The retention of SPM in waste water treatment has been shown to be very efficient and depends on the level of the sewage treatment stage of expansion. Based on the analysis of mass flows from several studies, about 1–10 % of microplastic (MP) entering the wastewater treatment plant (WWTP) are discharged in the effluents, while potentially >65 % of the MPs retained, can accumulate in the sewage sludge (Miino et al. 2024). The remaining MPs are removed from the water flux with the other residues and will be disposed separately (e.g. grit fraction, grease, oils, etc.). Due to variable information in literature, we refer to mean retention efficiency of WWTPs regarding MP according to ECHA (2019). They summarized the following mean MP-retention numbers, that are consequently applied in the E- calc_SPM concept:

- primary treatment: 80.5%
- additional secondary treatment: 97.5,
- additional tertiary treatment: 99.2%.

These average retention efficiencies can vary depending on the size and quality of the treatment plant but are confirmed in general by recent studies (e.g. Dronjak et al 2023; Miijo et al 2024).

Due to their persistence, the presence of SMPs applied to agriculture via sludge as fertilizer is correlated to the amount of sludge spread (Yang et al 2021). The E-calc_SPM concept, therefore, includes an estimation of emission of SPM to wastewater that leads to its emission into the aqueous environment as well as to soil via sewage sludge that is used as fertilizer on fields. Data on the wastewater treatment in the EU have to be reported under the European Urban Wastewater Treatment Directive (UWWTD, 91/271/EEC) and statistical data can be derived via the freshwater

information system for Europe EUROSTAT (2025) and "WISE Freshwater" (European Union (europa.eu)). According to these statistics, all wastewater in the EU is collected by sewer systems. Data from Eurostat for 2025, however, indicate that just 88%% of the EU-population is connected to a sewage treatment plant. Of the produced sludge 53.4%% was used in agriculture or composting or re- used by other uses (fagriculture).The remaining fraction is directed to landfills, sludge incineration or is managed and disposed in another way. fagriculture is therefore the key emission factor to account for the indirect SPM emissions via sludge to soil (SPMcum_soil).

According to the average removal efficiency of WWTP in the EU any SPM emitted from either industrial point sources or wide-spread uses leads to a cumulated emission of 13.2% of the used SPM into surface water (SPMcum_water) and 46.3% to soil via sludges (SPMcum_soil). Hence, only roughly 60% of the emitted SPMs enter the environment. The relevant information is summarized in Table A-2.

Combining these figures lead to the following picture:

Table A-2: EU-data on sewage treatment and sludge disposal and emissions (EU mean):

	Wastewater disposal		**SPM reduction in WW [a] (to sludge)**	**SPM emission to sludge**	**SPM emission to water [b]**	**SPM to soil** (via sludge) [c]
	EU-weighted average fractions (Eurostat 2021)					
Sewage collected	100%					
Primary treatment	88.0%	1.23%	80.5%	0.99%	0.24%	0.53%
Primary & Secondary treatment		17,60%	97.5%	17.16%	0.44%	9.17%
Primary to Tertiary treatment		69.17%	99.2%	68.62%	0.55%	36.62%
Wastewater not treated	12.0%		0%	0%	12%	0%
Cumulated SPM release factor from wastewater emissions (SPMcum)					**SPM_cum water = 13.22-%**	**SPM_cum-soil = 46.3%**

[a] reduction data from ECHA, 2019

[b] waste water disposal minus SPM to sludge

[c] SPM emission to sludge * fagriculture

Calculation of SPM emissions to the environment in the Regions

The calculation of emission estimations follows the two steps described above:

a) Environmental release from uses (use specific SPERC emission factors to the environment)

b) Environmental emission of SPMs after sewage treatment to water and soil

The overall calculation starts with the identification of appropriate uses (SPERC). Because all SPERCs in table A-1 indicate emissions to air and water only, the emission to soil is considered secondary via

sludge disposal only. Air emissions are generally not leading to environmental SPM emissions are therefore neglected.

The application of equations 1 + 2 provide relevant information to calculate the weighted EU-mean emissions for SPM on a screening level. We are aware that the generic SPM emissions can deviate from SPM emissions on regional and local scales because the levels of wastewater treatment and connectivity differ significantly between EU member states (MS). The requirement of reporting of a company is expected per legal entity which may represent only one or a few countries in the EU. In order to allow an adaptation to regional reporting requirements, eq. 1 + 2 can be modified by applying $SPM\_cum\ water\_MS$ and $SPM\_cum\ soil\_MS$ for each MS on reginal scale instead. These factors were derived by using statistical data from Eurostat based on the relative proportion of the individual sewage treatment situation per MS (see Annex 2).

In combination of eq. 1 and eq 2 the following calculation can be performed for each use (SPERC) and MS:

(eq A-1):

$$E_{SPM(SPERC)\_MS} = Tonnage_{SPM\text{-}containing\ product\_MS\ (SPERC/a)} \times c_{SPM\ product\_MS} \times RF(water)_{SPERC} \times [SPM_{cum\_water\_MS} + SPM_{cum\_soil\_MS}]$$

where :

$E_{SPM(SPERC)\_MS}$	= the total emissions tonnage of SPM per use acc. to SPERC and MS per year	[t/a]
$Tonnage_{SPM\text{-}containing\ product\_MS\ (SPERC/a)}$	= the SPM-containing product use tonnage in a MS per use as defined under one SPERC per reporting year	[t/a]
$c_{SPM\ product\_MS}$	= concentration of SPM-polymer in SPM-containing product sold in the MS	[%]
$RF(water)_{SPERC}$	= the generic release factor of emissions to water for each SPERC (cf. table (A-1)	[%]
$SPM_{cum\_water\_MS}$	= release fraction of SPMs to surface water in MS *(cf. table Annex-2)*	[%]
$SPM_{cum\_soil\_MS}$	= release fraction of SPMs to soil via sludge application *in MS (cf. table Annex-2)*	[%]

Annex 2: Wastewater treatment in 27 EU countries (data EUROSTAT, for 2021)

Country	Treated sewage (total)	Population connected to primary wastewater treatment only	Population connected to secondary wastewater treatment	Population connected to tertiary wastewater treatment	Sludge Disposal to agriculture/ compost (fagriculture)	SPM_cum water_MS	SPM_cum-soil_MS
Belgium	98,0%	0,0%	18,9%	79,1%	26%	3,1%	24,9%
Bulgaria	92,0%	1,5%	38,4%	52,1%	87%	9,7%	78,3%
Czechia	85,0%	0,1%	8,0%	76,9%	82%	15,8%	69,4%
Denmark	99,8%	0,1%	8,6%	91,1%	87%	1,1%	85,5%
Germany	99,3%	0,0%	4,7%	94,6%	25%	1,5%	24,4%
Estonia	87,0%	0,0%	7,0%	80,0%	87%	13,8%	75,3%
Ireland	96,9%	0,6%	67,1%	29,2%	99%	5,2%	94,2%
Greece	94,9%	0,0%	6,6%	88,3%	25%	6,0%	23,3%
Spain	89,3%	1,9%	29,9%	57,6%	87%	12,3%	76,3%
France	100,0%	0,0%	30,6%	69,4%	84%	1,3%	83,2%
Croatia	85,8%	15,4%	65,4%	5,0%	79%	18,9%	63,9%
Italy	62,5%	2,9%	18,7%	40,9%	46%	38,9%	28,0%
Cyprus	83,5%	0,0%	0,1%	83,4%	68%	17,2%	56,5%
Latvia	77,8%	0,4%	21,3%	56,0%	32%	23,3%	24,3%
Lithuania	76,1%	0,1%	6,6%	69,4%	76%	24,6%	57,5%
Luxembourg	101,3%	0,8%	13,9%	86,6%	11%	-0,1%	10,8%
Hungary	81,8%	0,1%	7,5%	74,3%	93%	19,0%	75,1%
Malta	99,0%	91,6%	7,4%	0,0%	0%	19,1%	0,0%
Netherlands	100,0%	0,0%	0,4%	99,7%	0%	0,8%	0,0%
Austria	100,0%	0,0%	5,0%	95,1%	44%	0,9%	43,8%
Poland	75,7%	0,0%	14,2%	61,5%	31%	25,1%	23,0%
Portugal	91,0%	8,0%	0,0%	83,0%	54%	11,2%	47,6%
Romania	60,0%	4,2%	9,0%	46,7%	30%	41,4%	17,6%
Slovenia	95,5%	0,0%	48,4%	47,1%	1%	6,1%	0,8%
Slovakia	70,7%	0,1%	68,7%	1,9%	52%	31,1%	36,1%
Finland	100,0%	0,0%	15,0%	85,0%	95%	1,1%	93,9%
Sweden	100,0%	0,0%	15,0%	85,0%	76%	1,1%	75,1%

Annex 3: Uses covered by a SPERCs' applicability domain

Life cycle step	SPERC	Applications / Uses
Formulation	FEICA / EFCC SPERC 2.1a.v3 FEICA / EFCC SPERC 2.2b.v3 FEICA / EFCC SPERC 2.3a.v1	- Formulation of adhesives, sealants - Formulation of construction chemical products
Industrial use	FEICA SPERC 5.1a.v4 (solvent-borne) FEICA SPERC 5.1c.v4 (water-borne)	- Industrial automated use of adhesives by roller or brushing application, indoor - Industrial large scale spray application of adhesives in containment - Industrial large scale spray application of adhesives in a spray booth - Industrial application of reactive adhesives - Industrial application of reactive adhesives processed above 40 °C - Industrial small-scale application of adhesives - Industrial manual use of adhesives and sealants by roller or brushing application
Professional / Consumer use	FEICA / EFCC SPERC 8f.1a.v2 (adhesives + construction chemicals, outdoor) FEICA SPERC 8c.3.v3 (adhesives, indoor) EFCC SPERC 8c.1a.v2 (construction chemicals, indoor)	- Professional low energy distribution of adhesives and primers on large areas, outdoors - large-scale use of construction chemical products by roller or brushing application, outdoor - small-scale use of Construction Chemicals by roller or brushing application, outdoor - use of Construction Chemicals by spray application (high energy), outdoor - large-scale use of Construction Chemicals by pouring application, outdoor - small-scale use of Construction Chemicals by pouring application, outdoor - Professional large-scale application of 2- or multi-component reactive adhesives - Professional large-scale application of cementitious based adhesives for tile bonding - Professional small-scale application of adhesives, sealants or primers - Professional small-scale application of reactive adhesives and sealants - Professional application of reactive sealants - Consumer use: Universal glues DIY glues, Spray glues, Joint sealants - Professional large-scale bonding with water based and 1-component reactive adhesives, indoors - Professional large-scale application of cementitious based adhesives for tile bonding - - large-scale use of Construction Chemicals by roller or brushing application, indoor - small-scale use of Construction Chemicals by roller or brushing application, indoor - use of Construction Chemicals by spray application (high energy), indoor - large-scale use of Construction Chemicals by pouring application, indoor - small-scale use of Construction Chemicals by pouring application, indoor

Literature

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