

Note on substance identification and the potential scope of a restriction on uses of 'microplastics'

1. Introduction

ECHA is assessing the need for a REACH restriction on intentional uses of 'microplastic' particles. As an outcome of the *stakeholder workshop on the intentional uses of microplastic particles* held at ECHA on 30-31 May 2018¹, ECHA announced that it would publish a note outlining in broad terms what it has learnt about the identification of 'microplastics' (which is often referred to as the microplastics definition) and what steps the Agency will take to refine its understanding on key unresolved issues as it concludes its investigation by January 2019. The note would also elaborate on the relationship between substance identification and the potential scope of any proposed restriction.

This note reflects our current understanding based on the information available when written. As such, we reserve the right to deviate from any of the statements or conclusions in subsequent publications (i.e. the Annex XV report) should these be justified by the further assessment of information on the hazard, exposure and risks of microplastics or other socio-economic considerations.

The concern associated with 'microplastic' particles stems, in straightforward terms, from the potential environmental and human health risks posed by the presence of particles of polymer-based materials in the environment that are:

- (a) small (typically microscopic) making them readily available for ingestion, and
- (b) very resistant to normal environmental degradation, which will lead to them being present in the environment for a long time after their initial release.

These properties are known to result in exposure to environmental receptors including invertebrates, fish, marine reptiles, birds and cetaceans (either directly or via secondary poisoning) and may also result in exposure to humans (via food or water that contains microplastics). This exposure could be associated with unacceptable risks².

Our work is focussed on microplastics that are released to the environment through the use of products that intentionally contain them and this note should be interpreted against this context³. Work being done by others is focussed on microplastics released to

¹ <https://echa.europa.eu/-/stakeholder-workshop-on-microplastic-particles>

² Various hazards have been associated with microplastic particles, including both physical/mechanical hazards e.g. obstructing or interfering with the normal functioning of feeding apparatus (potentially after being mistaken for food) or gills, as well as (eco)toxicological hazards introduced by the polymers themselves, or via residual monomers or polymer additives (e.g. stabilisers, plasticisers, flame-retardants, clarifying agents, anti-static agents, etc.) in materials. Hazards have also been associated with environmental pollutants that adsorb to particles after they have been released to the environment. In this respect, ECHA's investigation will comprise of a risk assessment, underpinned by a structured evaluation of available information in the peer-reviewed scientific literature as well as relevant grey literature or ongoing research. The assessment will be focussed on the risks posed by intentional uses of microplastics, but will also be necessarily informed by the literature on 'secondary' microplastics.

³ It is assumed that all microplastic particles are added to, or incorporated in, products to provide a technical

the environment through the degradation of larger articles produced from polymers (termed secondary microplastics) or through littering.

Critical elements of our assessment, and any proposed restriction arising from it, will be to consider a) how and to what extent the polymer-based materials that are deliberately added to products contribute to this concern and b) how these should be appropriately identified. The latter is often referred to as the 'microplastic' definition. Following from this, it will also be necessary to identify which uses of these 'microplastics' should be proposed for restriction and whether some of the uses of these materials should not.

It is currently unclear if the microplastic concern is limited to common polymer-based synthetic 'plastics' such as polypropylene or polyethylene or if other synthetic polymer-based materials that may also exist in the environment as persistent particles would also contribute to the concern (e.g. elastomeric materials). Similarly, this concern is not limited to the marine environment, although the occurrence of plastic litter in the marine environment generally has raised awareness of the potential impacts of these materials, both for scientists and policy makers. Microplastic particles have been found in wastewater, sewage sludge, freshwater and in the terrestrial environment. Microplastics have also been found in drinking water and in species of fish and shellfish consumed as food.

Stakeholders responded to ECHA's call for evidence for this restriction proposal⁴ on the basis of a 'working definition' for microplastic. This working definition deliberately identified a wide range polymer-based materials as microplastics. This was intended to encourage stakeholders to participate in the call for evidence. However, ECHA has been explicit since beginning its work on this restriction that it will refine its approach to the identification for these materials where this is appropriate and justified.

It should be noted that the microplastic definition will not necessarily be equivalent to the scope of any proposed restriction. The definition is part of the identification of the substances that are of interest, whereas the scope defines what the restriction actually applies to. For example, a polymer could be defined as a 'microplastic' when it exists in a certain physical state and has a particular morphology, but only certain uses of this polymer could be proposed to be restricted. In line with Annex XV of the REACH Regulation, ECHA will carefully consider the risks, costs and benefits of uses of microplastics to society as a whole when proposing the scope of a restriction.

2. Microplastic identification (microplastic definition)

2.1. Starting point

There is no internationally recognised or standardised definition of a 'microplastic'. This can be readily appreciated by the diversity of different definitions that have been applied across the various examples of legislative and voluntary measures adopted across the

function. Therefore, any deliberate addition of a microplastic to a product, irrespective of the intended function, is *per se* considered to be an intentional use.

⁴ The call for evidence was open on the ECHA website from 01 March 2018 to 11 May 2018.

EU and internationally for these materials. Accordingly, the scope of these measures (i.e. the uses that are targeted by the measure) are also frequently different. However, existing measures typically include, at a minimum, 'rinse-off' cosmetics products⁵.

The request to ECHA from the European Commission⁶ referred to microplastic particles as '*synthetic water-insoluble polymers of 5mm or less in any dimension*'. After discussing with the Commission, ECHA subsequently adopted a 'working definition' for microplastic particles for its call for evidence as '*any polymer⁷, or polymer-containing, solid⁸ or semi-solid⁹ particle¹⁰ having a size of 5mm or less in at least one external dimension*'.

The intention was that **all** four of the criteria in the definition (substance, state, morphology, dimensions) would need to be fulfilled concurrently for a material to be considered as a 'microplastic' and, therefore, for its uses to be of interest to ECHA.

The ECHA working definition did not distinguish between synthetic (i.e. artificial), naturally occurring or modified naturally occurring polymers or between water soluble and water insoluble polymers. However, these elements are recognised to be important for risk assessment and information on these aspects were specifically requested in the call for evidence. Both of these aspects are discussed further in Section 3 of this note.

2.2. Responses to the call for evidence

Respondents to the call for evidence were invited to provide comments on the ECHA working definition. Although many respondents welcomed the broad scope of the working definition, some highlighted that as the definition was underpinned with the term polymer rather than 'plastic' it would cover considerably more substances than other microplastic definitions (based, for example, on thermoset or thermoplastics).

In addition, the absence of criteria in relation to water solubility was also highlighted by certain respondents who felt that water soluble polymers are not associated with the microplastics concern.

In terms of dimensions, the absence of a lower size limit for particles and the criterion for only one single internal dimension to be <5mm was raised by some respondents as a concern. In particular, the use of a single dimension would result in large surface area polymer films/sheets (e.g. plastic bags and drinking straws) being considered as microplastics. Although these articles are of concern in relation to marine litter (from

⁵ These are cosmetic products that are intended to be removed after application on the skin, the hair or mucous membranes, such as shower gels, shampoos and face washes.

⁶ https://echa.europa.eu/documents/10162/13641/microplastics_cion_reqst_axvdossier_en.pdf/5c8be037-3f81-266a-d71b-1a67ec01cbf9

⁷ According to Article 3(5) of REACH a polymer is a substance consisting of molecules characterised by the sequence of one or more types of monomer units.

⁸ The solid form of a polymer in the environment (at ambient temperature and pressure of 101.3 kPa) may, for example, be defined via a melting point above 20 °C (includes waxes). Thermosetting plastics, however, will decompose rather than melt above 20 °C.

⁹ Semi-solid refers to a material which is in a physical state between a solid and a liquid. A polymer can, for example, be defined to be a semi-solid when its melting point (at ambient temperature and pressure of 101.3 kPa) is above 20 °C and its glass transition temperature is below 20 °C

¹⁰ A simple definition of a particle, according to various ISO standards (e.g. CEN ISO/TS 27687:2008 and ISO 14644-6:2007), is "minute piece of matter with defined physical boundaries". This can be further specified such that a "particle has a physical boundary that can also be described as an interface and that a particle can move as a unit".

which this size criterion was initially derived), they are unlikely to be intentionally added to products.

Some respondents also considered that the definition should only focus on uses that contribute to marine litter and should also exclude naturally occurring substances or substances that would biodegrade rapidly in the environment.

2.3. Criteria for microplastic identification

On the basis of the call for evidence and workshop discussions, the four criteria of the working definition continue to be relevant to the identification of microplastic: substance, physical state, morphology and dimensions. Although there is greater certainty in relation to some of these criteria than others, there remain several unresolved issues to be addressed. These are outlined below.

Similar to the working definition, it is important to note that it is envisaged that all of the four criteria are required to be fulfilled concurrently for a material to be considered as a microplastic. Table 1 (at the end of this note) gives examples of how the four microplastic identification criteria should be interpreted together when deciding if a use of a material would be consistent with a use of 'microplastic'.

2.3.1. Substance identity

The substance identification criterion of the microplastic working definition was based on the term 'polymer'. This was principally because these substances are defined under REACH, whilst plastics are not. In addition, and despite the pervasive use of the term microplastic, we did not receive sufficient evidence to conclude that the underlying 'microplastics' concern is limited to common polymer-based synthetic 'plastics' rather than other synthetic polymer-based materials. Therefore, we will continue to consider polymers *per se* as an appropriate starting point for substance identification for this restriction, in line with the original request from the Commission. However, on the basis of the conclusions of the risk assessment, we will consider whether a sub-set of polymers would be more appropriate to use as the basis for a proposed restriction.

The working definition included polymers that occur in nature in solid/semi-solid particulate form (e.g. cellulose or starch). Polymers that occur in nature can, by default, be considered to be inherently (bio)degradable in the environment. Therefore, our current view is that they should not be considered microplastics.

This approach is consistent with Article 2(5) of REACH (as elaborated in Annexes IV and V). However, polymers that occur in nature that have been chemically modified in some respect (e.g. cross-linked) should be considered to be microplastics where they also meet the criteria for physical state, morphology and dimensions outlined in the sections below. The relevance of these polymers to the scope of a restriction will depend on whether they are released to the environment through their use (see section 3.1.2) and on their (bio)degradability in the environment (see section 3.1.3).

2.3.2. Physical State

The physical state criterion relates to the occurrence/presence of a material as a solid. Materials could be present as solids in a product placed on the market for consumers or professionals, or in a preceding life-cycle step (e.g. formulation).

We will also continue to explore whether and to what extent semi-solid polymers (whilst also considering morphology and dimension aspects) may contribute to the microplastics concern and how this should be defined. The definitions for solid and semi-solid underpinning the ECHA working definition of microplastic will be the starting point for this (see footnotes 8 and 9 in this document).

2.3.3. Morphology

The microplastics concern is associated with particles. We currently consider that the presence of a polymer as a particle is one of the key features of a microplastic.

A particle can be defined as a *"minute piece of matter with defined physical boundaries"*. This can be further specified such that a *"particle has a physical boundary that can also be described as an interface and that a particle can move as a unit"*. We did not receive many comments on the definition of a particle in the call for evidence.

Particles can occur with various morphologies e.g. spherical (bead), flake or fibre. In general, we do not currently have sufficient information to conclude if it would be appropriate to include or exclude particular particle morphologies from the microplastic identification. However, we are carefully considering how any microplastic identification criteria should relate to thin polymer films with large surface area. Although we note that articles produced from thin polymer films (e.g. plastic bags) can occur as marine litter, we do not currently consider that these are the focus of our restriction unless the film has also been 'cut' into smaller pieces and then deliberately added to products (e.g. certain glitters). In addition, we will further consider if polymer coatings on small particles, such as seeds, can contribute to the concern; particularly where these are intended to be released to the environment.

We note that non-solid polymer particles can also occur for example in liquid-liquid emulsions. However, as these particles would not be solid or semi-solid they would not be addressed in this restriction. This characteristic of particles emphasises why it is important to consider multiple criteria when identifying microplastics.

2.3.4. Dimensions

We received many comments in the call for evidence in relation to the most appropriate dimensions of a particle to consider when identifying an object as a microplastic and how the length of these dimensions should be determined. As outlined above, we will continue to explore how to best include relevant morphologies, identified primarily on the basis of risk, whilst excluding those that are not. This will include considerations in relation to the potential for any size criterion to be circumvented by making existing particles either slightly larger or smaller than currently. In addition, we need to ensure that relevant particles that have a fibre morphology are appropriately identified (as these

may typically be longer than 5mm in one dimension).

We will continue to explore the potential need for setting a lower size limit for a 'microplastic'. However, we do not consider that the term 'microplastic' would limit our investigation or any proposed restriction to particles $>1 \mu\text{m}$. From the information available to date, the need for such a lower limit from a hazard/risk perspective is not immediately evident and may therefore be difficult to define in a non-arbitrary fashion. For example, particles typically become more reactive when they are smaller and are also more readily able to pass across biological membranes. We note that a lower size limit could be important for the practicality and enforceability of any proposed restriction.

Some of the comments received highlighted that including nanomaterials with the scope of any restriction could result in the 'double regulation' of these materials. However, the recent revisions to the REACH Annexes in relation to information requirements for nanomaterials are not currently considered to preclude a proposal for a restriction on 'nanoplastics' as part of our current work.

On the basis of these various considerations we will explore this issue further and consider the appropriateness of a lower size limit ranging from the nanoscale (between 1 and 100 nm) to the microscale.

3. Relationship between the definition of a microplastic and the potential scope of a restriction (relevance to the concern)

The scope of any proposed restriction on intentional uses of microplastic will employ the microplastic identification criteria outlined above as a starting point but will also need to consider whether an intentional use of 'microplastics' contributes to the human health or environmental concern to be addressed by the restriction and to what extent. Any proposed scope would also reflect, as relevant, the socio-economic dimension (i.e. the costs and benefits of a restriction from the perspective of society as a whole) and other criteria for a restriction as outlined in Annex XV of REACH, such as effectiveness, practicality and monitorability. Socio-economic assessment will be performed, as relevant, at later stages of assessment. This section focuses on risk-based screening criteria (relevance to the concern) for identifying uses for further assessment.

As per the microplastic identification criteria above, in order for a use of a microplastic to contribute to the potential concern, it is envisaged that several criteria would need to be met concurrently. Some of the specific criteria that we are considering are outlined below, as follows:

- Microplastic present at the point of use
- Microplastic released during use (or subsequent life-cycle step)
- Microplastic persistent in the environment

There may be a degree of overlap between these considerations. In addition, we reserve the right to amend or develop additional criteria on the basis of the conclusions of the

risk assessment.

Table 1 (at the end of this note) gives examples of how these criteria should be interpreted together when considering if a use of a microplastic should be considered as of potential concern and, therefore, relevant for further assessment in terms of a restriction.

3.1.1. Microplastic present at the point of use

Where microplastics (identified according to the criteria outlined above) are present at the point of use then these uses will potentially be within the scope of a restriction. An example would be the use of an exfoliating polyethylene bead in a rinse-off cosmetic product or a polymer-based anti-caking agent in fertilisers or microfibers in paints for consumer use.

An area that we have identified for further consideration relates to where microplastics are not present in products but are potentially formed at the point of use and could be subsequently be released. An example of this is 'film-forming' soluble polymers in cosmetics. We will undertake further targeted consultation on this aspect as we develop our investigation further.

3.1.2. Microplastic released during use (or subsequent life-cycle step)

The releases of microplastics can occur during the initial use phase or, potentially, during a subsequent article service life or at end-of-life disposal. Where these releases occur they will potentially be of concern and may be included within the scope of a restriction. For example, where a paint contains a microplastic releases could occur during the initial use phase (via the washing of brushes/rollers etc). After the paint dries on the wall any microplastics initially present will be incorporated into the cured film. Although it is clear that the formation and release of secondary microplastics (e.g. from a larger article or matrix via abrasion or weathering) is outside of the scope of our investigation and potential restriction, the release of any of the microplastic particles that were originally present in the paint may be of concern.

Alternatively, uses of microplastics that do not result in their release to the environment at any stage of life-cycle are unlikely to contribute to the concern. These would include uses where microplastics are strictly contained throughout their complete life-cycle (including their manufacture, use, any article service-life and end of life disposal). Based on the information we have received in the call for evidence this could include uses of microplastics in the manufacture of some pharmaceuticals.

Equally, microplastics that are completely consumed during their use (e.g. melted into a larger article via an extrusion or other similar process such that they no longer meet the morphology and dimension elements of the microplastic identification criteria) can be considered as not contributing to the concern.

3.1.3. Potential for persistence in the environment

This criterion is comprised of two elements: solubility and (bio)degradability.

Polymer substances are unlikely to contribute to the microplastic concern where a polymer is soluble in the product and also remains dissolved in the environment after release¹¹. However, we need to explore if appropriate standard methods are available and whether there should be threshold (cut-off) values for demonstrating solubility. Some relevant considerations on the persistence testing of poorly soluble substances is already available in ECHA Guidance (Chapter R.7b and R.11)¹².

Equally, an insoluble or poorly soluble synthetic polymer that (bio)degrades relatively quickly under environmentally relevant conditions is unlikely to contribute to the microplastics concern. Therefore, polymers that can be demonstrated to biodegrade sufficiently rapidly in the environment may not be relevant to include within the scope of any proposed restriction on microplastics. We will continue to explore how to address and incorporate the potential for polymer (bio)degradation within the scope of the restriction. We acknowledge that this is an emerging area of research and we are also investigating whether any of the existing standard methods for determining the (bio)degradation of chemicals in the environment materials (such as OECD 301 / OECD 306) and their associated thresholds and guidance could be meaningfully applied to microplastic materials. Alternatively, we will consider whether modified guidance, testing protocols or thresholds would be needed. Our assessment will also need to address the scenario where it is not considered to be possible to establish appropriate criteria for (bio)degradation as part of this restriction investigation.

4. Summary and planned next steps

The note can be summarised as follows:

1. There is no internationally recognised or standardised definition of a 'microplastic'. Microplastics can be identified on the basis of criteria relating to substance, physical state, morphology and dimensions.
2. The identification of microplastics is distinct from the scope of a potential restriction, which will take into account additional criteria as listed in Annex XV of REACH.
3. Polymers *per se* are an appropriate starting point for substance identification for this restriction. However, polymers that occur in nature can, by default, be considered to be inherently (bio)degradable and should not be considered as microplastics.
4. We will continue to explore whether and to what extent semi-solid polymers may contribute to the microplastics concern and how these materials should be

¹¹ Whilst soluble polymers may be considered as not contributing to the 'microplastic' concern, this is not equivalent to a conclusion that they do not pose any risk to the environment. We will ensure that, where relevant, any information relating to the risks of soluble polymers in the environment is summarised in our Annex XV report.

¹² <https://echa.europa.eu/guidance-documents/guidance-on-information-requirements-and-chemical-safety-assessment>; "The ECHA *Guidance on Information Requirements and Chemical Safety Assessment* section R.7.8.5 (Endpoint Specific Guidance R.7.b) suggests that water solubility below 1mg/L or below the detection limit of the analytical method of the tested substance should be used for considering the substance as poorly water soluble...["

defined.

5. Particles can occur with various morphologies e.g. spherical (bead), flake or fibre. In general, we do not currently have sufficient information to conclude if it would be appropriate to include or exclude particular particle morphologies from the microplastic identification. Films with large surface areas and coated items will be considered particularly carefully.
6. From the information available to date, the need for a lower size limit from a hazard/risk perspective is not immediately evident and may therefore be difficult to define in a non-arbitrary fashion. We do not consider that the term 'microplastic' would limit our investigation or any proposed restriction to particles >1 µm. The recent revisions to the REACH Annexes in relation to information requirements for nanomaterials are not currently considered to preclude a proposal for a restriction on 'nanoplastics' as part of our current work.
7. Where microplastics (identified according the criteria outlined above) are present at the point of use these uses will potentially be within the scope of a restriction.
8. Uses of microplastics that do not result in their release to the environment at any stage of their life-cycle are unlikely to contribute to the concern.
9. Microplastics that are completely consumed during their use (e.g. melted into a larger article via an extrusion or other similar process such that they no longer meet the morphology and dimension elements of the microplastic identification criteria) can be considered as not contributing to the concern.
10. Polymer substances are unlikely to contribute to the microplastic concern where a polymer is soluble in the product and also remains dissolved in the environment after release. However, we need to explore if appropriate standard methods are available and whether there should be threshold (cut-off) values for demonstrating solubility.
11. An insoluble or poorly soluble synthetic polymer that (bio)degrades relatively quickly under environmentally relevant conditions is unlikely to contribute to the microplastics concern. We are also investigating whether any of the existing standard methods for determining the (bio)degradation of chemicals in the environment materials (such as OECD 301 / OECD 306) and their associated thresholds and guidance could be meaningfully applied to microplastic materials.
12. ECHA will proceed further with its assessment taking into account the considerations above. ECHA may revise its approach as its assessment of hazard and risk progresses. Additional information to address data gaps will be obtained via targeted consultation with relevant stakeholders.

Table 1. Application of microplastic identification criteria to indicative uses of polymers alongside risk-related criteria for identifying 'relevance to the restriction scope'

Table 1 provides an illustration of how the microplastic identification criteria can be interpreted alongside the complementary risk-based criteria used to establish whether an indicative use can be considered to be relevant to the scope of a potential restriction. It is important to note that only intentional uses of microplastics are considered here. Accidental releases to the environment or the formation of secondary microplastics in the environment are outside of the scope of this restriction by default as the regulation of these sources is being considered elsewhere. The examples in individual rows are based on the information received in the call for evidence and this interpretation should be considered as **indicative and preliminary** only; further uses will also be considered. Additional information (denoted with '?') will be required prior to concluding whether a use is relevant to the potential scope of a restriction. This information will be obtained by the Agency through targeted consultation with respective stakeholders.

Indicative use	'Microplastic' definition				Microplastic? yes/no (all four criteria to be met for yes)	Relevance to the restriction scope ('microplastic' concern)			Of potential concern / relevant for further assessment? yes/no ¹ (all three criteria to be met for yes)
	Synthetic polymer (2.3.1)	Solid (2.3.2)	Particle (2.3.3)	Size / dimensions (2.3.4)		Microplastic at point of use (3.1.1)	Microplastic released during use (or subsequent life-cycle step) (3.1.2)	Microplastic persistent in environment (3.1.3)	
Polyethylene 'microbead' in rinse-off cosmetic products	✓	✓	✓	✓	Yes	✓	✓ via wastewater	✓	Yes
Polyethylene-based glitter in leave on cosmetic products	✓	✓	✓	✓	Yes	✓	✓ via wastewater	✓	Yes
Polymer encapsulation systems for fertilisers and plant protection products	✓	✓	✓	✓	Yes	✓	✓ via direct release	✓	Yes

Indicative use	'Microplastic' definition				Microplastic? yes/no (all four criteria to be met for yes)	Relevance to the restriction scope ('microplastic' concern)			Of potential concern / relevant for further assessment? yes/no ¹ (all three criteria to be met for yes)
	Synthetic polymer (2.3.1)	Solid (2.3.2)	Particle (2.3.3)	Size / dimensions (2.3.4)		Microplastic at point of use (3.1.1)	Microplastic released during use (or subsequent life-cycle step) (3.1.2)	Microplastic persistent in environment (3.1.3)	
Anti-caking additives in fertilisers for agricultural use	✓	✓	✓	✓	Yes	✓	✓ via direct release	✓	Yes
Microfibres or microspheres in paints for consumer use	✓	✓	✓	✓	Yes	✓	✓ via washing of brushes etc; releases during service life to be further assessed	✓	Yes
Polymer-based fragrance encapsulation systems in detergents or other household products	✓	✓	✓	✓	Yes	✓	✓ via wastewater	✓	Yes
Polyacrylonitrile fibres as fillers in construction material	✓	✓	✓	✓	Yes	✓	? Possibly only released unintentionally via accidental release to be further assessed	✓	?
Polymer-based seed coatings	✓	✓	?	?	?	✓	✓ via direct release	✓	?

Indicative use	'Microplastic' definition				Microplastic? yes/no (all four criteria to be met for yes)	Relevance to the restriction scope ('microplastic' concern)			Of potential concern / relevant for further assessment? yes/no ¹ (all three criteria to be met for yes)
	Synthetic polymer (2.3.1)	Solid (2.3.2)	Particle (2.3.3)	Size / dimensions (2.3.4)		Microplastic at point of use (3.1.1)	Microplastic released during use (or subsequent life-cycle step) (3.1.2)	Microplastic persistent in environment (3.1.3)	
Synthetic polymer solution for sealing cement used in oil wells	✓	✓	✓	✓ (some >5mm)	Yes	✓	? Possibly only released unintentionally via accidental release to be further assessed	✓	?
Polymers used for water and wastewater treatment	?	?	?	?	?	?	?	?	?
Articles containing super absorbent polymers for medical / consumer use	✓	?	?	✓	?	?	?	?	?
Use of super absorbent polymers for agricultural use	✓	?	?	✓	?	?	✓ via direct release	?	?
The use of polymer pellets (nurdles) for the production of articles by extrusion or similar 'melt' process that forms a matrix	✓	✓	✓	✓ (some >5mm)	Yes	✓	* Completely consumed	* No release	No

Indicative use	'Microplastic' definition				Microplastic? yes/no (all four criteria to be met for yes)	Relevance to the restriction scope ('microplastic' concern)			Of potential concern / relevant for further assessment? yes/no ¹ (all three criteria to be met for yes)
	Synthetic polymer (2.3.1)	Solid (2.3.2)	Particle (2.3.3)	Size / dimensions (2.3.4)		Microplastic at point of use (3.1.1)	Microplastic released during use (or subsequent life-cycle step) (3.1.2)	Microplastic persistent in environment (3.1.3)	
Chemically-modified naturally occurring polymers used as media in ion-exchange columns (no loss)	✓	✓	✓	✓	Yes	✓	✗ No release	✗ No release	No
Cellulose, or other naturally occurring polymer, in wash-off cosmetic product (not chemically modified)	✗ Naturally occurring polymer	✓	✓	✓	No	✗	✗	✗ (bio)degradable	No
Silica bead for exfoliating in wash-off cosmetic product	✗	✓	✓	✓	No	✗	✗	✗	No
Consumer/professional products (including detergents and cosmetics) containing water soluble polymers (soluble in the product and remains dissolved in the environment)	✓	✗	✗	✗	No	✗	✗	✗ Appropriate criteria / standards required	No

Notes: 1 – In addition to the 'screening criteria' applied here. The scope of any proposed restriction will be based on all of the criteria in Annex XV of REACH.