

Report prepared by



Report prepared for

Department of Agriculture, Water and the Environment

An assessment of the presence of microbeads in rinse-off personal care, cosmetic and cleaning products currently available within the Australian retail market

Project report

Final report - 30 November 2020





Project title:	An assessment of the presence of microbeads in rinse-off personal care, cosmetic and cleaning products currently available within the Australian retail market
Report title:	Project report
Client:	Department of Agriculture, Water and the Environment
Authors:	Kyle O'Farrell and Fiona Harney
Project reference:	A21514
Document reference:	R04-02-A21514
Date:	30 November 2020
Report citation:	N/A

Disclaimer

This report has been prepared on behalf of and for the exclusive use of the Department of Agriculture, Water and the Environment, and is subject to and issued in accordance with the agreement between the Department of Agriculture, Water and the Environment and Envisage Works. Envisage Works accepts no liability or responsibility whatsoever for any use of or reliance upon this report by any third party.

Envisage Works contact details

ABN: 12 584 231 841
Post: PO Box 7050, Reservoir East VIC 3073
E-mail: admin@envisageworks.com.au
Phone: +61 (0)3 9016 5490



Figure 1 – Assorted skin care products



CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION	2
1.1 Project purpose	2
1.2 Project scope	3
1.3 Data gaps and limitations.....	7
1.4 Survey method	8
2 RESULTS	12
2.1 Products containing microbeads by product type	12
2.2 Products containing microbeads by polymer type	14
2.3 Distributors selling microbead containing products	15
2.4 Quantities of products containing microbeads.....	15
2.5 Leave-on product types - survey results	17
3 REFERENCES.....	20
APPENDIX A – Targeted microbeads review outcomes.....	21



EXECUTIVE SUMMARY

This market research and report was commissioned by the Department of Agriculture, Water and the Environment (DAWE) to identify rinse-off personal care, cosmetic and cleaning products sold into the Australian market that contain plastic microbeads.

The primary objective of this microbead survey is to help measure the success of the voluntary phase-out by industry of microbeads as ingredients in rinse-off cosmetic, personal care and cleaning products sold in Australia.

While this project represents an update to the precursor baseline microbeads data project from 2018, it has focused solely on rinse-off products to enable DAWE to measure the success of the voluntary industry phase-out.

Data on the presence of microbeads in two leave-on products, deodorants and moisturising creams, have been reported separately in Section 2.5 as these products are outside the scope of the voluntary phase-out.

In carrying out this project, an extensive series of national market (retail-level) surveys have been completed to determine the prevalence of the targeted product types by; quantity, polymer type, and other key attributes. In addition, in-scope products identified as containing microbeads were recorded by stock-keeping units (SKUs)¹ and number of units on shelves.

The 2020 research included 248 in-store surveys, and 29 surveys of online stores and marketplaces (e.g. Amazon and eBay).

Key results

- There were approximately 27,000 unique stock keeping units (SKUs) within the product types that were inspected during the retail outlet surveys, of which an estimated 8,100 SKUs fell into the 'rinse-off' product types. **Of the rinse-off SKUs 0.7% (58 SKUs) were identified as containing the target microbeads.**
- The 58 products containing microbeads were sold through 88 of the 277 retail outlets surveyed, so 189 (68%) of the audited outlets did not sell a single (in-scope) product that contained microbeads. The 58 products were distributed by 38 companies.
- Across the 58 rinse-off products identified as containing microbeads, there were 60 target microbead polymer types identified. That is, two of the 58 products contained two microbead polymer types.
- Polyethylene (45.0%) was the most common polymer type observed in use, followed by polyethylene terephthalate (18.3%) (including metallised PET), and dimethicone crosspolymer (11.7%).
- The product type group 'facial scrub/cleanser/mask' (60.3%) was the most common product type observed to contain microbeads, followed by hair colouring (13.8%), and body wash/scrub (10.3%).

¹ A stock keeping unit (SKU) is a unique item for sale. SKU can also refer to the unique identifier or barcode that identifies a particular stock keeping unit.



1 INTRODUCTION

1.1 Project purpose

The Department of Agriculture, Water and the Environment (DAWE) commissioned Envisage Works to undertake an assessment (in-store and online survey) on the presence of microbeads in rinse-off personal care, cosmetic and cleaning products available within the Australian retail market in 2020.

At the 2016 Meeting of Environment Ministers (MEM), ministers agreed to support a voluntary industry phase-out of plastic microbeads found in rinse-off personal care, cosmetic, and cleaning products sold in Australia. The voluntary phase out was led by Accord Australasia (Accord) and overseen by the Commonwealth Department of Environment and Energy (now DAWE) and the NSW Environment Protection Authority. To support the ongoing success of the voluntary phase-out, the Commonwealth issued Accord with a monitoring and assurance protocol in December 2018.

Accord is the national industry association representing manufacturers and suppliers of hygiene and cosmetic products. Accord has implemented an initiative called BeadRecede which supports all member and non-member companies engaged in the making and supply of cosmetic, personal care and certain cleaning products included in the scope of the phase-out.

The extensive and continuing work carried out by Accord and its members is acknowledged, however, to provide a comprehensive picture of the status of products containing microbeads available on the Australian market at this point in time, both Accord and non-Accord member products have been surveyed.

In 2018, DAWE commissioned Envisage Works to complete an assessment of personal care and cosmetic products sold in supermarkets and pharmacies. The scope of the survey was broader than the 2020 survey and the BeadRecede campaign and included leave-on cosmetics that may be wiped-off, such as blush or eye make-up, as well as rinse-off products. The 2018 survey found that of approximately 4400 products which potentially contained microbeads, 6 per cent (267 products) were identified as containing microbeads or other non-soluble plastic polymers.

While the project is an update and extension of the precursor microbeads market survey project undertaken in 2018, the 2020 assessment excludes wipe-off/leave-on products as these are outside the scope of the voluntary microbead phase-out, which focused on rinse-off cosmetic, personal care and cleaning products. As wipe-off/leave-on products are outside the scope of the voluntary phase-out, no change is expected in the use of microplastics in these products since the last survey in 2018.



1.2 Project scope

1.2.1 Information collected

The information collected through this research includes:

- The types, number, percentages, and quantities of rinse-off cosmetic, personal care, cleaning products and industrial handwash products which contain microbeads.
- The brand, producer, product name and purpose of each product containing microbeads.
- A list of supermarkets, discount and variety stores, hardware stores, pharmacy chains and online outlets, that sell rinse-off products containing microbeads.
- The estimated quantity of the product sold in-store by unit volume (converted to a weight basis).
- Quantities of the products in the Australian market (estimated via store distribution and published retail sales data) by unit volume and per cent market share.
- The types of microbeads present in the surveyed products, a review of the polymer types and a justification for their inclusion in the survey.

Figure 2 – An example of the types of product surveyed



1.2.2 Microbeads definition

Microbeads are small, solid manufactured plastic particles with an upper size limit of 5 mm in diameter that are water insoluble and non-degradable, with typical diameters of around 100–300 microns (μm). The use of microbeads has been reported in personal care products such as deodorant, shampoo, conditioner, shower gel, toothpaste, hair colour, shaving cream, sunscreen, insect repellent, anti-wrinkle creams, moisturisers, hair spray, facial masks, baby care products and cosmetics.

Microbeads are used as ingredients in these products for a variety of purposes including the following 4 main functions:

- abrasive
- aesthetic
- exfoliant
- filler.

While it was not assessed as part of this project, it is worth noting that all these functions can probably be provided by non-toxic, biobased and/or readily biodegradable materials, and that the use of fossil hydrocarbon based unbiodegradable materials is not a specific functional requirement.



For the purposes of this project, the criteria that determined inclusion on the target microbeads survey list were:

- The substance was a highly transformed synthetic polymer; and
- The substance might be used in the targeted 'rinse-off' product types; and
- The particle size of the substance was likely to be 1 micron or larger. However, it was not necessary that the particle was a regular bead shape; and
- The biodegradation time of the substance in the main receiving compartment (end-fate sink) was likely to be months to years.

Note that while the term 'microbeads' implies a spheroidal shape, for this project the terms microbead and microplastic were assumed to be equivalent in meaning.

The rinse-off products containing microbeads, targeted in this project includes anything that commonly goes to the sewer during typical use.

1.2.3 Plastic polymer types

The following list of plastic polymer types was adopted for the surveys. Refer to Section 1.4.1 for detail on the method applied to determine the list of targeted ingredients.

For the purpose of this survey, the presence of microbeads was determined based on whether any of the following polymer types were identified in the ingredients list of the surveyed products.

Table 1 – Polymer types under investigation

Polymer	Polymer group
Methyl methacrylate crosspolymer	Acrylates
Polymethyl methacrylate (PMMA)	Acrylates
Polytetrafluoroethylene (PTFE)	Fluorocarbon
Nylon-10/10	Polyamides
Nylon-11	Polyamides
Nylon-12	Polyamides
Nylon-12/6/66 copolymer	Polyamides
Nylon-5	Polyamides
Nylon-6	Polyamides
Nylon-6/11	Polyamides
Nylon-6/12	Polyamides
Nylon-66	Polyamides
Polyethylene terephthalate (PET)	Polyesters
Polyethylene terephthalate (PET) – metallised	Polyesters



Polymer	Polymer group
Polylactic acid (PLA)	Polyesters
Polylactic acid (PLA) – metallised	Polyesters
Polyethylene (PE)	Polyalkenes
Polyethylene (PE) – oxidised	Polyalkenes
Polypropylene (PP)	Polyalkenes
Dimethicone / polyglycerin-3 crosspolymer	Silicones
Dimethicone crosspolymer	Silicones
Dimethicone PEG -10/15 crosspolymer	Silicones

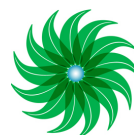
Note: Rows highlighted in green are polymer types that were in scope in 2020 but were not on the target polymers list for the 2018 surveys.

1.2.4 Product types

The following list of rinse-off product types were in-scope for the surveys:

Table 2 – Rinse-off product types under investigation

Product type	Comments
Cleaning – commercial/industrial	-
Cleaning – home	This includes indoor and outdoor applications, such as windows, roofs, cars, etc.
Hair care – colour	-
Hair care – shampoo/conditioner	-
Hair care – shaving cream	-
Hair care – styling	Includes hair sprays, styling gels, styling pastes and similar.
Oral hygiene – mouthwash	-
Oral hygiene – toothpaste	-
Oral hygiene – tooth whitening products	-
Skin care – body wash/scrub	Includes cleansers and exfoliants for the body generally.
Skin care – facial scrub/cleanser/mask	This includes all rinse-off facial products. Masks were assumed to all be 'rinse-off' based on the typical user instructions.
Skin care – hand cleaner	Includes commercial 'heavy-duty' hand cleaners.



This assessment includes commercial/industrial hand cleaners and rinse-off surface cleaning products. Any microbeads present in these products will commonly go to the sewer during typical use.

The following list of product types were audited during the surveys to ensure that survey coverage was adequate. As they are not immediately rinsed-off, they are not included in the voluntary phase-out. While some of these product types may be dispersed into the environment during normal wear, a proportion can reach sewer/stormwater through later rinsing and washing. The survey data for these product types is reported separately in Section 2.5.

Table 3 – Product types that are not rinse-off but were surveyed

Product type	Comments
Deodorant – roll-on	-
Deodorant – spray-on	-
Deodorant – stick	-
Skin care – skin cream/moisturiser	Also includes lip moisturisers and skin primers.
Skin care – other	Includes 'leave-on' products such as toners, primers, hydrating mists and various oils.

1.2.5 Retailer types

The following retailer types were the focus of the in-store surveys:

- automotive and machine shop supply outlets
- commercial/industrial cleaning outlets
- department stores
- discount stores
- hardware outlets
- pharmacies
- skin care and cosmetics
- supermarkets
- other types (e.g. hair salons, homewares and gift stores, and toy stores).

The online survey assessment focused on:

- Cosmetic and personal care product retailers
- Hardware, protective gear, or industrial equipment suppliers
- Automotive care retailers
- Commercial and industrial cleaners
- E-commerce companies.



1.2.6 Jurisdictions

The in-store surveys were conducted in the seven jurisdictions of the Australian Capital Territory, New South Wales, South Australia, Tasmania, Queensland, Victoria, and Western Australia. In all jurisdictions except Victoria, there was a focus on the capital city central business district and suburban, or outer suburban, large shopping centres and shopping strips.

Due to the lockdown response to the COVID-19 pandemic in Melbourne, most Victorian surveys were conducted in Geelong, Victoria's second largest city.

1.2.7 Other notes on the scope

Other noteworthy attributes on the project scope are:

- Products registered with the Therapeutic Goods Administration (TGA), including sunscreens, were generally excluded from the survey as TGA products are only required to list the active ingredients on packaging, which excludes microbeads. For this reason, product packaging could not be reviewed for information on the presence of microbeads in these products. The exception to this was toothpaste, which was surveyed.
- Parallel imports² were within the scope for both in-store and online surveys. These were included because the same product by appearance or name, might have different ingredients depending on where it is manufactured.

1.3 Data gaps and limitations

The selection of retail outlets was based on a combination of factors, including an agreed number of retail outlets to survey, agreed retail outlet types to target, and an agreed spread of geographic locations, both metropolitan and regional. As this is not a probability-based sampling approach, the level of any sampling bias or underestimation has not been determined.

The identification of products containing microbeads was constrained at some types of retail outlets, such as higher-end skincare and cosmetics outlets. This was due to high staff numbers and service attention resulting in a reduced ability to photograph or otherwise document product details. The number of observations of products containing microbeads in these types of retail outlets are more likely to contain gaps, as a proportion of products potentially containing microbeads may not have been identified and surveyed.

It was common for surface cleaning products not to have their ingredients listed, which limited the ability to positively confirm that these products did not contain microbeads.

The COVID-19 pandemic did mean there were restrictions in some stores in relation to touching products. However, this did not have any material impact on the survey coverage of the project.

² A parallel import is a non-counterfeit product imported from overseas without the permission of the company with the local distribution rights or the intellectual property owner. Parallel imports are also often referred to as grey imports.



1.4 Survey method

1.4.1 Targeted microbeads review

A review of the current literature and photos of product ingredient labels from the 2018 project was undertaken to update the list of targeted ingredients for the 2020 project. The criteria that determined inclusion on the target list are stated in Section 1.2.2.

The tasks undertaken for the target list update were:

1. Literature review to identify polymer types that can be regarded as microbeads (or microplastics) when added to rinse-off products. A particularly useful resource in completing this task was the microplastics list published by the Plastic Soup Foundation (2020).
2. Review of label photos from the 2018 project to identify product ingredients in use, in the targeted product types, that might be considered microbeads. This was an important step in keeping the target list as short as possible, to keep it practicable for auditors to apply in stores.
3. Specify and apply the criteria (listed in Section 1.2.2) for determining inclusion on the target list.
4. Update the target list of microbeads to be included in the market surveys. Provide advice on the likely fates of microbead polymer types following use.

Provided in Appendix A is a summary of the outcomes of the review of microbeads to be targeted during the surveys (see Table A-1). In total there were 22 polymers listed.

1.4.2 Retail outlet surveys

The in-store surveys used a 'shadow shopper' type approach, during which a project team member acted as an ordinary 'shopper' while reviewing the ingredient panel and other details of on-shelf products. There were typically 2–3 photos taken of the packaging of each product containing microbeads, and several of the shelf array. The auditors surveyed all the product types listed in Section 1.2.4, counted and reported in-store or after leaving the store, then re-checked ingredients when performing data entry.

In order to assess the commercial/industrial hand wash, the auditors were told to search for these in automotive and machine shop supply outlets, commercial/industrial cleaning outlets, hardware stores, and any other relevant places. They selected up to 10 hand cleaning products SKUs to examine and audit, although typically there was less than this in-store.

With different auditors working across 7 physical jurisdictions, products were regularly surveyed more than once because they are sold in more than one retailer or retail type, and across some or all jurisdictions.



1.4.3 Online surveys

An online survey of the targeted product categories was undertaken to identify the level of availability of the microbead containing products through online suppliers, both based in Australia and overseas.

The online surveys were based on structured Google searches using combinations of keywords related to microbead products. The process was performed separately for commercial and industrial handwash, and then again for personal care products, using relevant keywords for these product types. For example, the terms; grit, workshop, abrasive were some of those used for the industrial hand wash, and the terms; exfoliant, body wash and facial for the personal care products. This process yielded a list of retailers and e-commerce companies that specialise in online sales of commercial/industrial cleaning product suppliers, and rinse-off personal care products. After using a combination of keyword searches, the first 15 – 20 results would be investigated, until significant repetition of products was observed.

There were 29 websites surveyed, including Catch.com.au, Cleaningshop.com.au, Cleanx.com.au, Restock.com.au, eBay, Amazon, Sephora, Ozhairandbeauty.com, Lookfantastic.com.au and Caretobeauty.com.

The online surveys were documented using the same survey form as that used for the in-store surveys.

1.4.4 Retail outlet survey coverage

Presented in Table 4 and Figure 3 are the number and types of retail outlets surveyed by jurisdiction. A total of 248 in-store surveys were completed and 29 online outlets. The average in-store time was 45–50 minutes.

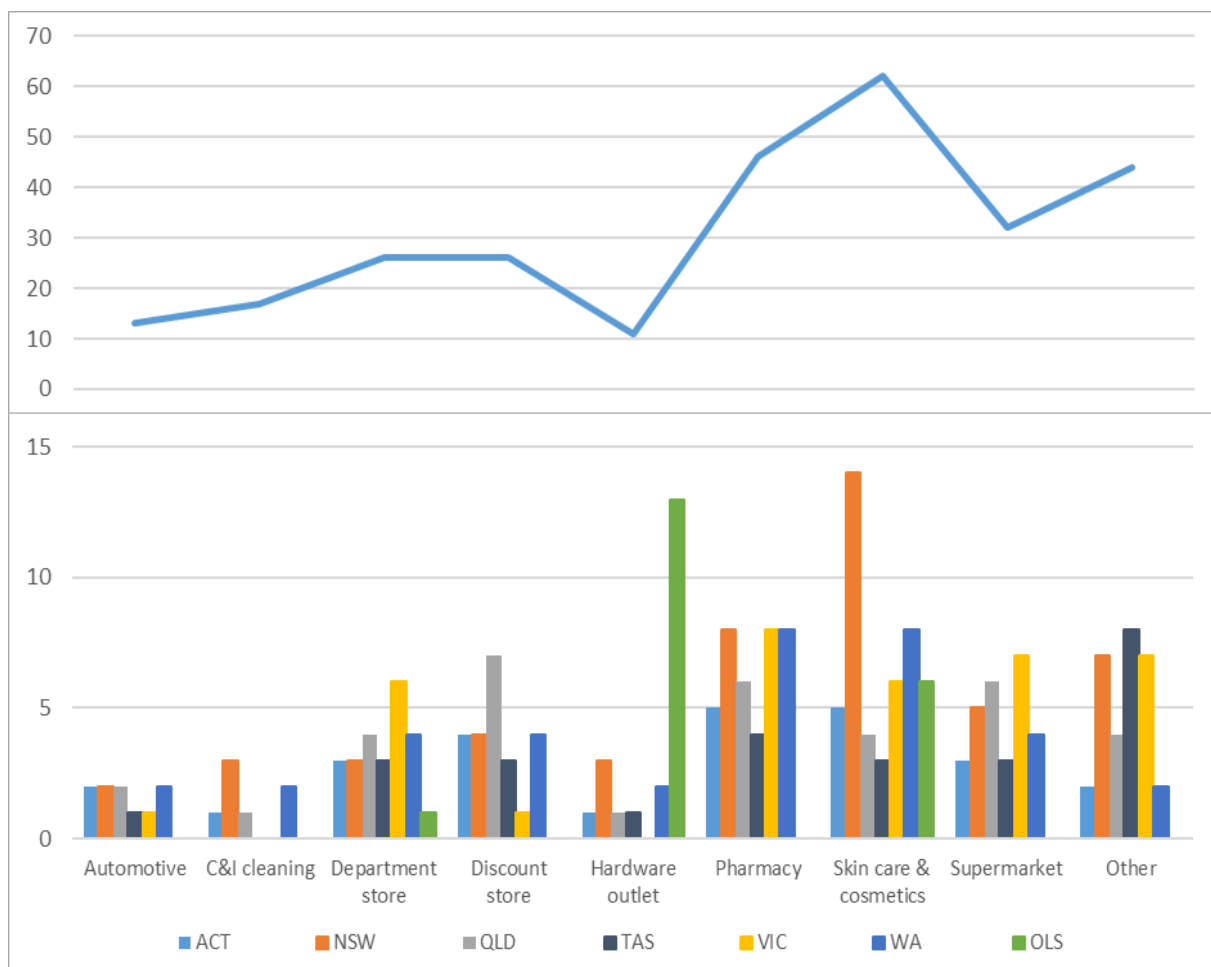
Table 4 – Completed surveys by retail outlet type and jurisdiction (by site count)

Retail outlet type	Online	ACT	NSW	QLD	SA	TAS	VIC	WA	Total
Automotive and machine shop supply	1	2	2	2	2	1	1	2	13
Commercial/industrial cleaning	8	1	3	1	2	0	0	2	13
Department store	0	3	3	4	3	3	6	4	13
Discount store	0	4	4	7	3	3	1	4	13
Hardware	1	1	3	1	2	1	0	2	13
Pharmacy	0	5	8	6	7	4	9	8	13
Skin care and cosmetics	13	5	14	4	9	3	5	8	13
Supermarket	0	3	5	6	4	3	7	4	13
Other ¹	6	2	7	4	8	8	7	2	13
Totals	29	26	49	35	40	26	36	36	

1. Examples of “Other” retail outlet types are clothes and homewares outlets with a limited range of products, toy stores, gift stores, hair salons, and retail outlets selling cleaning products (e.g. Officeworks).



Figure 3 – Completed surveys by retail outlet type and jurisdiction (by site count)



In more detail the survey coverage included:

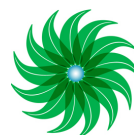
- **Automotive and machine shop supply outlets** – Survey coverage included visits to 12 physical stores and 1 online store, including Supercheap Auto (7), Repco Australia (5) and Autobarn (1). These 3 retailers have an estimated 29.8% market share of the automotive parts retailing sector in Australia (IBISWorld, 2020a).
- **Commercial/industrial cleaning supplies outlets** – Survey coverage included visits to 9 physical stores and 8 online stores. This sector is highly diverse, and it was not possible to estimate the aggregated market share of the companies that were surveyed.
- **Department stores** – Survey coverage included visits to 26 physical stores, including Kmart (6), Target (7), Big W (5), Myer (5) and David Jones (1). These 5 retailers have an estimated 89.7% market share of the department store sector in Australia (IBISWorld, 2020c).
- **Discount stores** – Discount store survey coverage included visits to 26 physical stores, including The Reject Shop (6), Best & Less (3), Smart Dollar (3), Dimmeys (1) and Daiso (1). These 5 retailers have at least an estimated 60% market share of the discount store sector in Australia (IBISWorld, 2020d; Envisage, 2020). In addition, another 14 outlets were surveyed.



- **Hardware stores** – Survey coverage included visits to 10 physical stores and 1 online store, including Bunnings (6), Thrifty Link Hardware (1) and Mitre 10 (1). These 3 retailers have at least an estimated 50% market share of the hardware store sector in Australia (IBISWorld, 2020e; Envisage, 2020).
- **Pharmacies** – Survey coverage included visits to 47 physical stores, including Chemist Warehouse (3), My Chemist (1), Amcal (4), Guardian (2), Terry White Chemmart (8), Priceline (4) and Pharmacy 4 Less (2). These retailers have at least an estimated 60% market share of the pharmacy sector in Australia (IBISWorld, 2020f; Envisage, 2020). In addition, another 23 outlets were surveyed.
- **Skin care and cosmetics stores** – Survey coverage included visits to 48 physical stores and 13 online stores, including Mecca Brands (7), Aesop (3), L'Occitane En Provence (4), Lush (3), The Body Shop (5), Estee Lauder (2) and Jurlique (2). These retailers have at least an estimated 40% or more market share of the skin care and cosmetics retail sector in Australia (IBISWorld, 2020g; Envisage, 2020). In addition, another 35 smaller chain and independent skin care and cosmetic retail outlets were surveyed.
- **Supermarkets** – Survey coverage included visits to 32 physical stores, including ALDI (7), Coles (5), Foodworks (3), IGA (5) and Woolworths (4). These retailers have at least an estimated 85% market share of the supermarket sector in Australia (IBISWorld, 2020h). In addition, another 8 outlets were surveyed.

1.4.5 Digital optical microscopic review of products

To assist in the identification of microbeads in products where the presence of microbeads was ambiguous, products were purchased where required. It was necessary to purchase only two products during the project (both as part of the online surveys), one of which was subsequently determined to contain polyethylene microbeads.



2 RESULTS

2.1 Products containing microbeads by product type

There were approximately 27,000 unique stock keeping units (SKUs) within the product types that were inspected during the retail outlet surveys, of which an estimated 8,100 SKUs fell into the rinse-off product types. **Of the rinse-off SKUs, 0.7% (58 SKUs) were identified as containing the target microbeads.**

Presented in Table 5 and Figure 4 are the results for the number of rinse-off products identified as containing microbeads, split by non-ACCORD and ACCORD membership, by product type.

Table 5 – Rinse-off products identified as containing microbeads, by product type

Product type	Non-ACCORD members	ACCORD members	Total	
	(SKU count)	(SKU count)	(SKU count)	(%)
Cleaning – commercial/industrial	0	0	0	0.0%
Cleaning – home	0	0	0	0.0%
Hair care – colour	8	0	8	13.8%
Hair care – shampoo/conditioner	1	0	1	1.7%
Hair care – shaving cream	0	0	0	0.0%
Hair care – styling	3	1	4	6.9%
Oral hygiene – mouthwash	0	0	0	0.0%
Oral hygiene – tooth whitening products	0	0	0	0.0%
Oral hygiene – toothpaste	0	0	0	0.0%
Skin care – body wash/scrub	4	2	6	10.3%
Skin care – facial scrub/cleanser/mask	20	15	35	60.3%
Skin care – hand cleaner ¹	4	0	4	6.9%
Totals	40	18	58	100.0%

1. In the 'Skin care – hand cleaner' category only heavy-duty workshop type hand cleaners were identified as containing microbeads.

The 58 products containing microbeads were sold through 88 of the 277 retail outlets surveyed, so 189 (68%) of the audited outlets did not sell a single (in-scope) product that contained microbeads. The 58 products were distributed by 38 companies.

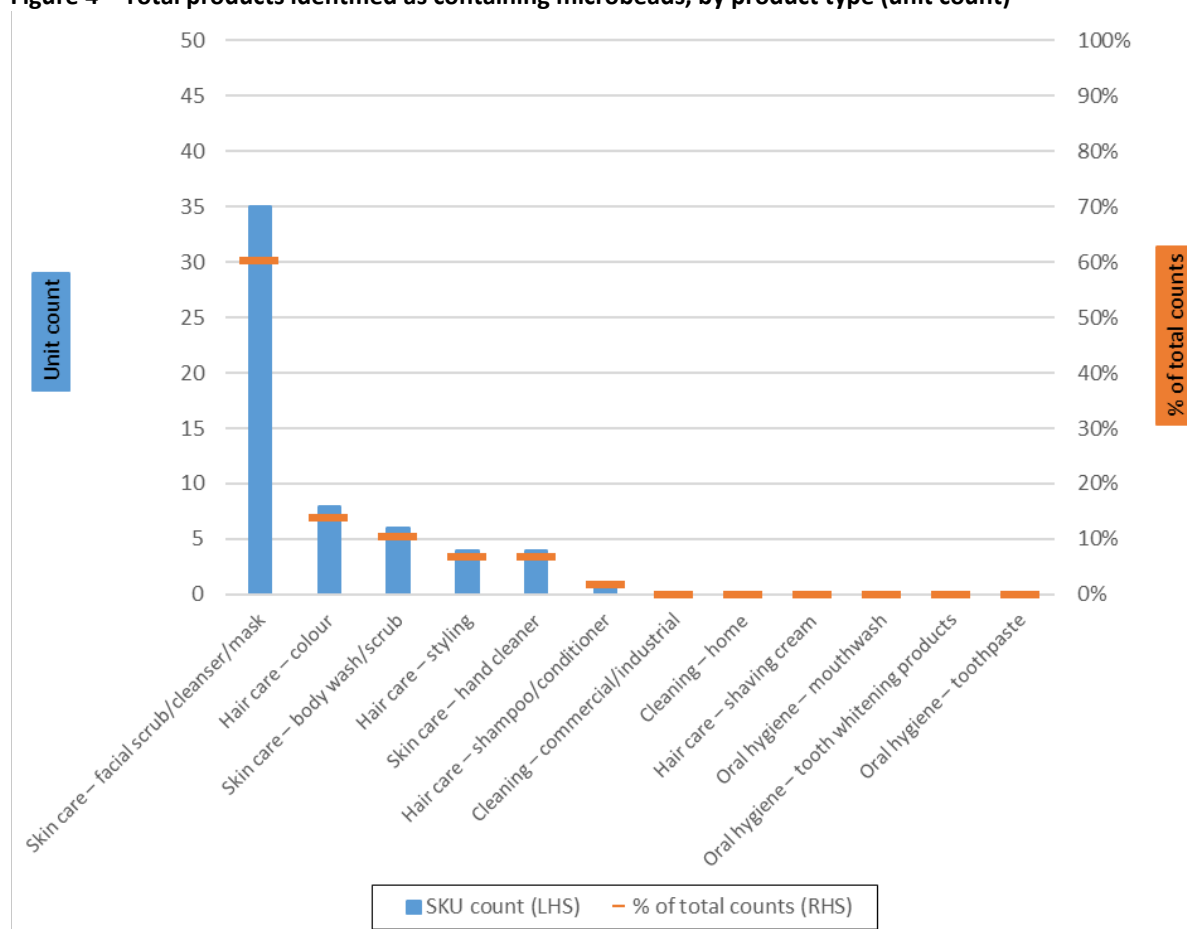
Facial scrub/cleanser/mask (60.3%) was the most common product type observed to contain microbeads, followed by hair colouring (13.8%), and body wash/scrub (10.3%).



There were no microbeads found in cleaning products or in oral hygiene products, such as toothpaste and mouthwash. However, it is noted that both these products groups were more likely than the other product groups to have incomplete or missing ingredients information on packaging.

The oral hygiene products registered with the Therapeutic Goods Administration (TGA) only need to list active ingredients. Cleaning products are not required to have an ingredients list. Auditors often observed that ‘environmentally friendly’ branded/marketted cleaning products were more likely to have a higher level of disclosure of ingredients, relative to equivalent mainstream products.

Figure 4 – Total products identified as containing microbeads, by product type (unit count)



It is worth noting that across the 89 in-scope SKUs found to contain the targeted microbeads there were 58 unique SKUs. That is, on average, each product identified as containing microbeads was surveyed 1.5 times. A product will be surveyed more than once because it appears in more than one retailer and/or across multiple jurisdictions. A duplicate survey rate of 1.5 times is low, possibly reflecting the relative obscurity of the rinse-off products identified as containing microbeads.



2.2 Products containing microbeads by polymer type

Presented in Table 6 and Figure 5 are the summary results for the number of rinse-off products containing microbeads, across both non-Accord and Accord members, by polymer type.

Across the 58 rinse-off products identified as containing microbeads, there were 60 target microbead polymer types identified. That is, two of the 58 products contained two microbead polymer types.

Polyethylene (45.0%) was the most common polymer type observed in use, followed by polyethylene terephthalate (18.3%) (including metallised PET), and dimethicone crosspolymer (11.7%).

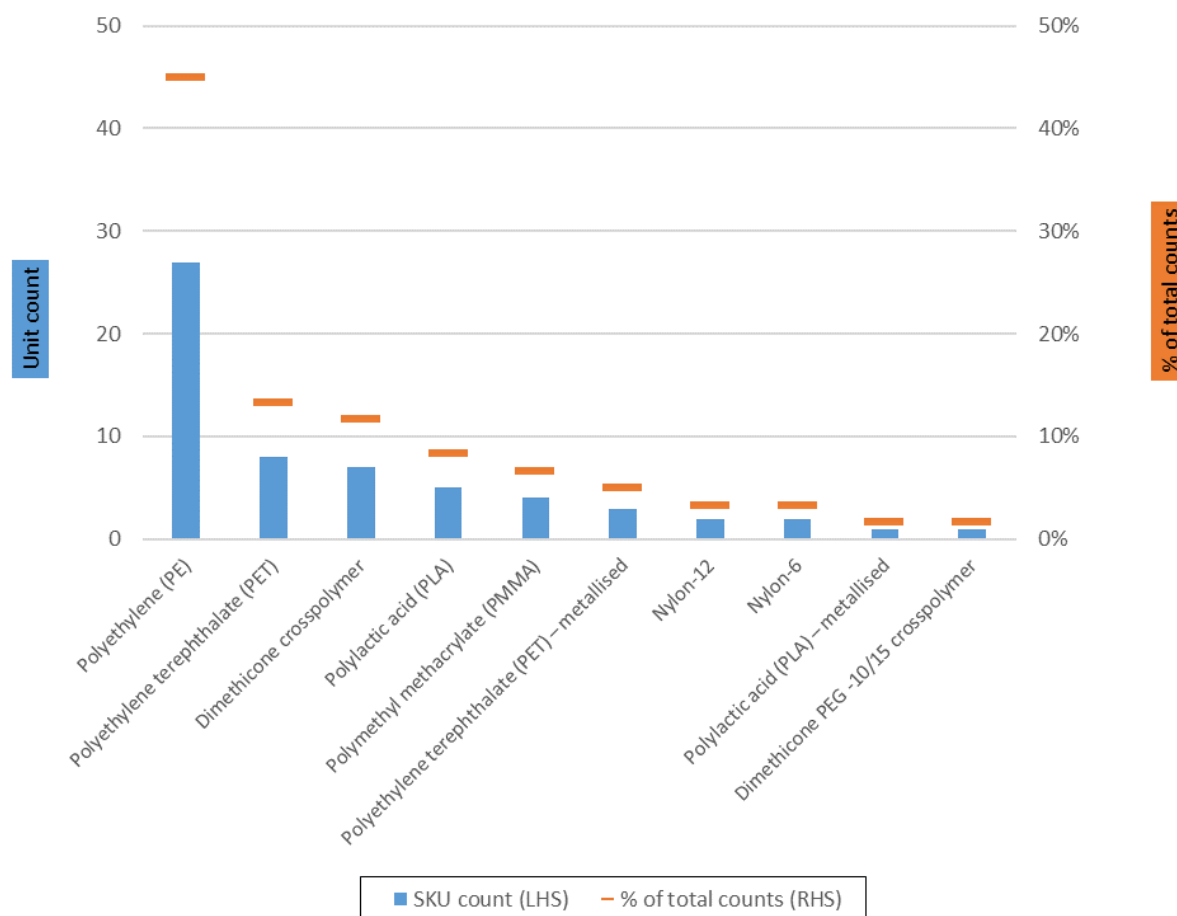
Table 6 – Rinse-off products identified as containing microbeads in 2020, by polymer type

Polymer type	Polymer group	Non- ACCORD members (SKU count)	ACCORD members (SKU count)	Total (SKU count)	Total (%)
Methyl methacrylate crosspolymer	Acrylates	0	0	0	0.0%
Polymethyl methacrylate (PMMA)	Acrylates	3	1	4	6.7%
Polytetrafluoroethylene (PTFE)	Fluorocarbon	0	0	0	0.0%
Polyethylene (PE)	Polyalkenes	15	12	27	45.0%
Polyethylene (PE) – oxidised	Polyalkenes	0	0	0	0.0%
Polypropylene (PP)	Polyalkenes	0	0	0	0.0%
Nylon-10/10	Polyamides	0	0	0	0.0%
Nylon-11	Polyamides	0	0	0	0.0%
Nylon-12	Polyamides	1	1	2	3.3%
Nylon-12/6/66 copolymer	Polyamides	0	0	0	0.0%
Nylon-5	Polyamides	0	0	0	0.0%
Nylon-6	Polyamides	2	0	2	3.3%
Nylon-6/11	Polyamides	0	0	0	0.0%
Nylon-6/12	Polyamides	0	0	0	0.0%
Nylon-66	Polyamides	0	0	0	0.0%
Polyethylene terephthalate (PET)	Polyesters	8	0	8	13.3%
Polyethylene terephthalate (PET) – metallised	Polyesters	3	0	3	5.0%
Polylactic acid (PLA)	Polyesters	5	0	5	8.3%
Polylactic acid (PLA) – metallised	Polyesters	1	0	1	1.7%
Dimethicone / polyglycerin-3 crosspolymer	Silicones	0	0	0	0.0%
Dimethicone crosspolymer	Silicones	1	6	7	11.7%
Dimethicone PEG -10/15 crosspolymer	Silicones	1	0	1	1.7%
Totals		40	20	60	100.0%

Note: Rows highlighted in green are polymer types that were in scope in 2020, but were not on the target polymers list in 2018.



Figure 5 – Total products identified as containing microbeads, by polymer type (unit count)



2.3 Distributors selling microbead containing products

The survey found 29 non-Accord member and 9 Accord member distributors that sell products containing microbeads to retailers. Several retailers are also the product distributors.

2.4 Quantities of products containing microbeads

Presented in Table 8 and Figure 7 are the quantities (weight basis) of the identified rinse-off products containing microbeads, grouped by product type.

This data is provided as a proxy for actual total sales data into the Australian market to give an indication of the relative scale of the sales of products containing microbeads. Actual sales data for each of the products identified during the surveys is not available. However, given the large survey sample size it is reasonable to expect that this percentage mass data provides some indication of the relative contributions of each of the targeted product types to the sale of microbeads onto the Australian market.

Note that this percentage data is based on the total weight of the product and is not adjusted for the concentration of microbeads in the product, which has not been determined as part of the project.

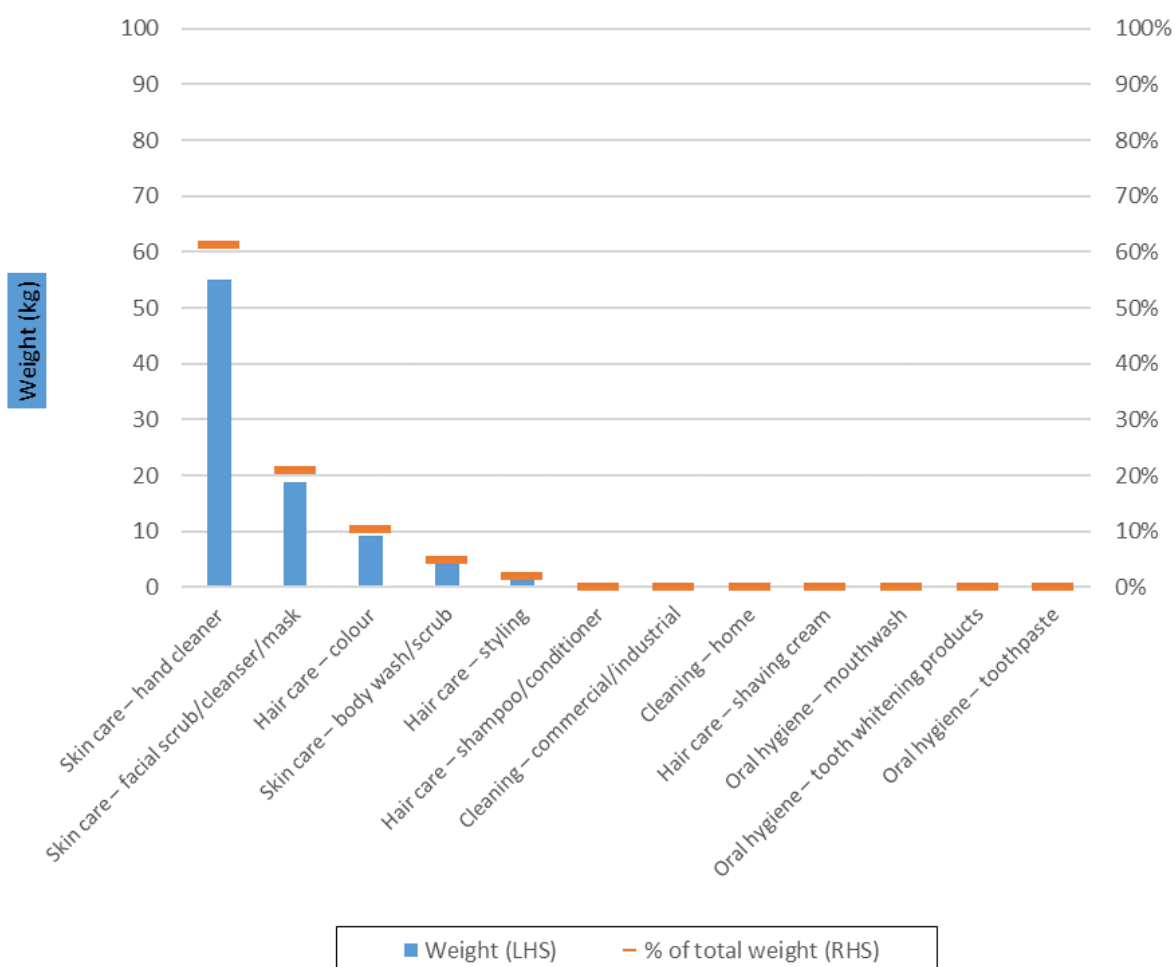


Table 8 – Products identified as containing microbeads, by product type (% mass basis)

Product type	Non-ACCORD members (% mass)	ACCORD members (% mass)	Total (% mass)
Cleaning – commercial/industrial	0.0%	0.0%	0.0%
Cleaning – home	0.0%	0.0%	0.0%
Hair care – colour	10.4%	0.0%	10.4%
Hair care – shampoo/conditioner	0.2%	0.0%	0.2%
Hair care – shaving cream	0.0%	0.0%	0.0%
Hair care – styling	1.7%	0.3%	2.0%
Oral hygiene – mouthwash	0.0%	0.0%	0.0%
Oral hygiene – tooth whitening products	0.0%	0.0%	0.0%
Oral hygiene – toothpaste	0.0%	0.0%	0.0%
Skin care – body wash/scrub	4.5%	0.4%	4.9%
Skin care – facial scrub/cleanser/mask	10.3%	10.8%	21.1%
Skin care – hand cleaner	61.4%	0.0%	61.4%
Totals	88.5%	11.5%	100.0%



Figure 6 – Products identified as containing microbeads, by product type (% mass basis)

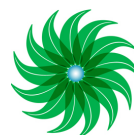


2.5 Leave-on product types - survey results

Leave-on products, such as cosmetics, moisturisers, and deodorants, are outside of the scope of the voluntary phase-out by industry. However, moisturisers and deodorants were also audited during this 2020 project, and key results for those product types are provided here.

While rinse-off products will typically not remain on the skin for more than 10 minutes, moisturisers and deodorants will be on the skin for several hours. Some of these products will be released into the environment during normal wear, and any remaining product may be either wiped off or washed off, following a similar disposal pathway to rinse-off product types. Many of these products were found to contain the target microbeads during the 2020 audits.

There is an extensive range of creams, moisturisers, serums, wrinkle treatments, and fillers that are on the market. A reasonably significant proportion of these were found to contain the targeted microbeads.



There were 412 SKUs in the audited leave-on product types that were identified as containing the targeted microbeads. Skin creams and moisturisers were the majority of this at 396 SKUs. Many of these products were also identified as containing microbeads in 2018.

There were also 16 stick or cream deodorants identified as containing microbeads. None of these products were identified as containing microbeads in 2018, so this may be an emerging application for microbeads.

Table 9 – Leave-on products identified as containing microbeads, by product type

Product type	Non-ACCORD members (SKU count)	ACCORD members (SKU count)	Total (SKU count)
Deodorant – roll-on	0	0	0
Deodorant – spray-on	0	0	0
Deodorant – stick	0	16	16
Skin care – skin cream/moisturiser	231	165	396
Totals	231	181	412



Table 6 – Leave-on products identified as containing microbeads, by product type and polymer type

Polymer type	Group	Deodorant – stick (SKU count)	Skin care – skin cream/moisturiser (SKU count)	Total (SKU count)
Methyl methacrylate crosspolymer	Acrylates	0	52	52
Polymethyl methacrylate (PMMA)	Acrylates	0	54	54
Polytetrafluoroethylene (PTFE)	Fluorocarbon	0	9	9
Nylon-10/10	Polyamides	0	0	0
Nylon-11	Polyamides	0	0	0
Nylon-12	Polyamides	0	75	75
Nylon-12/6/66 copolymer	Polyamides	0	0	0
Nylon-5	Polyamides	0	0	0
Nylon-6	Polyamides	0	0	0
Nylon-6/11	Polyamides	0	0	0
Nylon-6/12	Polyamides	0	1	1
Nylon-66	Polyamides	0	1	1
Polyethylene terephthalate (PET)	Polyesters	0	3	3
Polyethylene terephthalate (PET) – metallised	Polyesters	0	0	0
Polylactic acid (PLA)	Polyesters	0	0	0
Polylactic acid (PLA) – metallised	Polyesters	0	0	0
Polyethylene (PE)	Polyalkenes	0	86	86
Polyethylene (PE) – oxidised	Polyalkenes	0	0	0
Polypropylene (PP)	Polyalkenes	0	4	4
Dimethicone / polyglycerin-3 crosspolymer	Silicones	0	3	3
Dimethicone crosspolymer	Silicones	16	201	217
Dimethicone PEG -10/15 crosspolymer	Silicones	0	21	21
Totals		16	510	526

Note: There were 526 identified uses of the targeted polymer types across 412 products. That is, 114 of these products had 2 of the targeted polymer types as listed ingredients.

It is also noted that the 2018 audit scope (Envisage, 2018) included leave-on cosmetics such as eye make-up, foundation/blush and lip make-up. However, cosmetics were outside the scope of the voluntary industry phase-out, and these product types were not re-audited in 2020.

In 2018 many of these leave-on cosmetics were also found to contain the targeted microbeads. Please refer to this earlier report for details on the outcomes of the cosmetics microbeads audit.



3 REFERENCES

Envisage, 2018. *An assessment of the sale of microbeads and other non-soluble plastic polymers in personal care and cosmetic products currently available within the Australian retail (in store) market*, Melbourne: Report prepared by Envisage Works on behalf of the Department of Agriculture, Water and the Environment.

Envisage, 2020. *Envisage Works estimates of market shares by retail outlet type*, Melbourne: Envisage Works.

IBISWorld, 2020a. *Industry report G3921 - Motor Vehicle Parts Retailing in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020b. *Specialized industry report OD4126 - Cleaning and Maintenance Supplies Distributors in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020c. *Industry report G4260 - Department Stores in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020d. *Specialized industry report OD5466 - Discount Variety Stores in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020e. *Industry report G4231 - Hardware and Building Supplies Retailing in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020f. *Industry report G4271a - Pharmacies in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020g. *Industry report G4271b - Cosmetic and Toiletry Retailing in Australia*, Melbourne: IBISWorld.

IBISWorld, 2020h. *Industry report G4111 - Supermarkets and Grocery Stores in Australia*, Melbourne: IBISWorld.

Plastic Soup Foundation, 2020. *Beat the Microbead – List of microplastics – Red list*. [Online] Available at: <https://www.beatthemicrobead.org/guide-to-microplastics/red-list/> [Accessed 23 August 2020].



APPENDIX A – TARGETED MICROBEADS REVIEW OUTCOMES

Provided in the table below are the summary outcomes of the review of microbeads to be targeted during the surveys. In total there were 22 polymers short-listed for identification during the audits.

Many other substances were also considered for inclusion on the target list but were not as they did not satisfy the criteria for inclusion (see Section 1.4.1).

Table A-1 – Polymer types UNDER investigation (targeted for the audits)

Substance	Group	Typical form (microbead /microplastic)	Size range (micron)	Approximate biodegrade. time	Likely WWTP fate
Methyl methacrylate crosspolymer	Acrylates	Microplastic	>1	Months	Effluent
Polymethyl methacrylate (PMMA)	Acrylates	Microplastic	>1	Months	Effluent
Polytetrafluoroethylene (PTFE)	Fluorocarbon	Microbead	>1	Years	Biosolids
Nylon-10/10	Polyamides	Microbead	>1	Years	Biosolids
Nylon-11	Polyamides	Microbead	>1	Years	Biosolids
Nylon-12	Polyamides	Microbead	>1	Years	Biosolids
Nylon-12/6/66 copolymer	Polyamides	Microbead	>1	Years	Biosolids
Nylon-5	Polyamides	Microbead	>1	Years	Biosolids
Nylon-6	Polyamides	Microbead	>1	Years	Biosolids
Nylon-6/11	Polyamides	Microbead	>1	Years	Biosolids
Nylon-6/12	Polyamides	Microbead	>1	Years	Biosolids
Nylon-66	Polyamides	Microbead	>1	Years	Biosolids
Polyethylene terephthalate (PET)	Polyesters	Microbead	>1	Years	Biosolids
Polyethylene terephthalate (PET) – metallised	Polyesters	Microbead	>1	Years	Biosolids
Polylactic acid (PLA)	Polyesters	Microbead	>1	Months	Biosolids
Polylactic acid (PLA) – metallised	Polyesters	Microbead	>1	Months	Biosolids
Polyethylene (PE)	Polyalkenes	Microbead	>1	Years	Biosolids
Polyethylene (PE) – oxidised	Polyalkenes	Microbead	>1	Years	Biosolids
Polypropylene (PP)	Polyalkenes	Microbead	>1	Years	Biosolids
Dimethicone / polyglycerin-3 crosspolymer	Silicones	Microplastic	>1	Years	Effluent
Dimethicone crosspolymer	Silicones	Microplastic	>1	Years	Biosolids
Dimethicone PEG -10/15 crosspolymer	Silicones	Microplastic	>1	Years	Effluent