

APPENDIX 4. RECORDED EXAMPLES OF UNVERIFIED POLYMERIC INGREDIENTS OF CONCERN, WHICH COULD BE MICROPLASTIC INGREDIENTS (MPIS) IN SOME PRODUCT FORMULATIONS, FOUND IN PERSONAL CARE AND COSMETIC PRODUCTS (PCCPs) OR CLEANING PRODUCTS ON THE UK MARKET IN THE PERIOD FROM 2012 TO 2016

In Section 4.1 of FFI’s guidance document entitled ‘Removing or Restricting Microplastic Ingredients or “Microbeads” from Consumer and Industrial Products’ FFI introduced the concept of *unverified polymeric ingredients of concern*. Unverified polymeric ingredients of concern are ingredients that could manifest as solid, water insoluble plastic particles (therefore falling under the definition of marine litter) in some products and liquids or water soluble substances (that are beyond the scope of what can be considered marine litter) in other products. Several cited references also contain examples and explanations regarding such unverified polymeric ingredients of concern^{1,2,3}.

The names of unverified polymeric ingredients of concern as determined by the International Nomenclature of Cosmetic Ingredients (INCI) do not reveal whether the substances are used in solid, liquid, water-soluble or water-insoluble form – this can only be determined on a case by case basis by product manufacturers or formulators (NB INCI naming conventions do not apply to cleaning products). A list of over 110 examples of unverified polymeric ingredients of concern that we have found in the ingredient lists of consumer and industrial products on the UK market in the period from 2012 to 2016 is included in the table below. It is important to note, however, that there can be no exhaustive list of such ingredients.

Recorded Ingredient:	Recorded use in PCCPs/cleaning products:
<i>Acetates Copolymer</i>	Bath Product
<i>Acid/MA Copolymer</i>	Laundry Detergent
<i>Acrylamide/Sodium Acryloyldimethyltaurate Copolymer</i>	Body Scrub, Face Scrub, BB Cream, Moisturiser
<i>Acrylate Copolymer</i>	Fabric Stain Remover
<i>Acrylated/C10-30 Alkyl Acrylate Crosspolymer</i>	Bath Product, Body Glitter, Body Scrub, Deodorant, Face Scrub, Foot Scrub, Moisturiser, Mousse, Shaving Product, Toothpaste
<i>Acrylates/Beheneth-25 methacrylate copolymer</i>	Shampoo
<i>Acrylates Copolymer</i>	Bath Product, Body Glitter, Body Scrub, Deodorant, Face Mask, Face Scrub, Foot Scrub, Foundation, Hand Scrub, Lipstick, Mascara, Moisturiser, Mousse, Shampoo, Shaving Product, Shower Gel
<i>Acrylates/Aminoacrylates/C10 30 Alkyl PEG-20 Itaconate Copolymer</i>	Face Scrub
<i>Acrylates/ammonium methacrylate copolymer</i>	Face Scrub, Face Wash
<i>Acrylates/Dimethicone Copolymer</i>	BB Cream, Foundation
<i>Acrylates/Palmeth-25 Acrylate Copolymer</i>	Body Scrub, Face Scrub
<i>Acrylate / PEG-10 Maleate / Styrene Copolymer</i>	Bath Product
<i>Acrylates Crosspolymer-4</i>	Bath Product
<i>Acrylates/Steareth-20 Methacrylate Copolymer</i>	Bath Product, Face Scrub
<i>Acrylates/Stearyl Acrylate/Dimethicone Methacrylate Copolymer</i>	Foundation
<i>Acrylic Acid/Isobutyl Acrylate/Isobornyl Acrylate Copolymer</i>	Lipstick

<i>Acrylic Copolimer</i>	Washing Machine Cleaner
<i>Acrylic Copolimer Emulsion</i>	Fabric Stain Remover
<i>Acrylic Polymer</i>	Fabric Stain Remover
<i>Acrylic/Sulphonic Copolymer</i>	Dishwasher Detergent
<i>Alkyl methacrylates crosspolymer</i>	Face Scrub
<i>Ammonium Acryloyldimethyltaurate / Carboxyethyl Acrylate Crosspolymer</i>	Face Scrub
<i>Ammonium Acryloyldimethyltaurate/VP Copolymer</i>	Face Mask, Face Scrub, Shaving Product
<i>Ammonium polyacrylate</i>	BB cream, Body Scrub, CC cream, Moisturiser
<i>Anionic Polyurethane</i>	Fabric Stain Remover
<i>Bis-isobutyl peg/ppg-20/35/amodimethicone copolymer</i>	Shampoo
<i>Butylene/ethylene/styrene copolymer</i>	Body Scrub, Lip Balm
<i>Calcium Divinylbenzene Styrene Copolymer Sulfonate</i>	Laundry Detergent
<i>Capryloyl glycerin/sebacic acid copolymer</i>	Moisturiser
<i>Carboxylated Copolymer</i>	Washing Machine Cleaner
<i>Cera Microcristallina</i>	Body Scrub, Face Mask, Face Scrub, Foundation, Lipstick, Shaving Product
<i>Copolymer Acryelate</i>	Industrial Hand Cleaner
<i>Copolymer of Acrylic and Sulphonic Acids</i>	Dishwasher Detergent
<i>Co-polymer of PEG / Vinyl Acetate</i>	Laundry Detergent
<i>C30-45 Alkyl Cetearyl Dimethicone Crosspolymer</i>	Shower Gel
<i>Dimethicone Crosspolymer</i>	Face Mask, Deodorant
<i>Dimethicone/Divinyldimethicone/Silsexquioxane Crosspolymer</i>	Foundation
<i>Dimethicone/Methicone Copolymer</i>	BB Cream, Foundation
<i>Dimethicone/Peg-10/15 Crosspolymer</i>	BB Cream, Mascara, Shower Gel
<i>Dimethicone/Phenyl Vinyl Dimethicone Crosspolymer</i>	BB Cream, Face Scrub
<i>Dimethicone/Polyglycerin-3 Crosspolymer</i>	BB Cream, Foundation
<i>Dimethicone/vinyl dimethicone crosspolymer</i>	Body Glitter, Deodorant, Face Scrub, Fake Tan, Foundation, Moisturiser
<i>Dimethylacrylamide/Sodium Acryloyldimethyltaurate Crosspolymer</i>	Face Scrub
<i>Diphenyl Dimethicone/Vinyl Diphenyl Dimethicone/Silsexquioxane Crosspolymer</i>	Foundation, Pressed Powder
<i>Ethylene/propylene/styrene copolymer</i>	Body Scrub, Lip Balm
<i>Ethyltrimonium chloride methacrylate/hydrolyzed wheat protein copolymer</i>	Shampoo
<i>Gelatin Crosspolymer</i>	Deodorant
<i>Glycereth-7 hydroxystearate/IPDI copolymer</i>	Body Scrub
<i>Glyceryl Acrylate/Acrylic Acid Copolymer</i>	Bath Product, Body Glitter, Face Mask, Face Scrub, Mascara, Moisturiser, Shaving Product, Shower Gel

<i>Hdi/Trimethylol Hexyllactone Crosspolymer</i>	Blusher, Face Scrub, Lipstick
<i>Hydrogenated Polyisobutene</i>	BB Cream, Body Scrub, Face Scrub, Lipstick, Shaving Product
<i>Hydrogenated Styrene/Methyl Styrene/Indene Copolymer</i>	Lipstick
<i>Hydrogenated Styrene/Isoprene Copolymer</i>	Lipstick
<i>Hydroxyethyl Acrylate/Sodium Acryloyldimethyltaurate Copolymer</i>	Body Scrub
<i>Hydroxyethyl Acrylate/Sodium Acryloyldimethyl Taurate Copolymer</i>	BB Cream, Body Scrub, Face Scrub, Fake Tan, Lip Balm, Moisturiser, Shaving Product
<i>Lauryl Methacrylate/Glycol Dimethacrylate Cross polymer</i>	Face Scrub
<i>Methyl Methacrylate Crosspolymer</i>	Face Scrub, Moisturiser
<i>Modified Styrene/Acrylic Copolymer</i>	Fabric Stain Remover
<i>Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer</i>	Hairspray
<i>Palmitoyl Hydroxypropyl Trimonium Amylopectin/ Glycerin Crosspolymer</i>	Face Scrub
<i>PEG-2M</i>	Shaving Product
<i>PEG-7M</i>	Foaming Cleanser, Shaving Product
<i>PEG-14M</i>	Face Scrub, Shampoo, Shaving Product
<i>PEG-20M</i>	Toothpaste
<i>PEG-23M</i>	Shampoo, Shaving Product
<i>PEG-45M</i>	Shampoo
<i>PEG-90M</i>	Shaving Product
<i>PEG-8/SMDI Copolymer</i>	Shampoo
<i>PEG/PPG-116/66 Copolymer</i>	Toothpaste
<i>Peg-12 Dimethicone Crosspolymer</i>	Mascara, Shower Gel
<i>PEI-2500</i>	Laundry Detergent
<i>Poloxamer 184</i>	Body Scrub
<i>Poloxamer 407</i>	Face Scrub, Shampoo, Toothpaste
<i>Polyacrylamide</i>	BB Cream, Body Scrub, Face Scrub, Moisturiser
<i>Polyamide-2</i>	Shampoo
<i>Polyacrylate</i>	Laundry Detergent, Fabric Stain Remover
<i>Polyacrylate-13</i>	Face Scrub
<i>Polyacrylate-1 Crosspolymer</i>	Face Scrub
<i>Polyacrylate-33</i>	Industrial Hand Cleaner
<i>Polyacrylate Crosspolymer-6</i>	Face Mask
<i>Polyester</i>	Fabric Stain Remover
<i>Polyethylenimine</i>	Dishwasher Detergent, Dishwasher Cleaner
<i>Polyglyceryl-2 Isostearate/Dimer Dilinoleate Copolymer</i>	Lipstick

<i>Poly(Glycol Adipate)/Bis-Hydroxyethoxypropyl Dimethicone Copolymer</i>	Foundation
<i>Polyisobutene</i>	Face Scrub
<i>Polylactic Acid</i>	Body Scrub, Face Scrub
<i>Polymer/Solids</i>	Body Scrub
<i>Polypropylene Terephthalate</i>	Face Scrub
<i>Polysilicone-1 Crosspolymer</i>	Foundation
<i>Polyurethane-40</i>	Foundation
<i>Polyvinyl Alcohol</i>	Dishwasher Detergent, Dishwasher Cleaner, Fabric Stain Remover, Laundry Detergent
<i>Polyvinylalcohol Crosspolymer</i>	Foundation
<i>Polyvinylpyrrolidone (PVP)</i>	Bath Product, Fabric Stain Remover
<i>PPG-17/IPDI/DMPA Copolymer</i>	Mascara
<i>PPG-51/SMDI Copolymer</i>	Face Scrub
<i>PVM/MA copolymer</i>	Body Glitter, Shampoo, Shaving Product, Toothpaste
<i>Styrene/Acrylamide Copolymer</i>	Bath Product
<i>Sodium Acrylate/Acryloyldimethyl Taurate Copolymer</i>	Face Scrub, Shaving Product
<i>Sodium acrylates copolymer</i>	Fabric Stain Remover, Face Mask, Face Scrub, Moisturiser
<i>Sodium Acrylic Acid/MA Copolymer</i>	Laundry Detergent
<i>Sodium Gluconate Acrylates Copolymer</i>	Shaving Product
<i>Styrene/Acrylates Copolymer</i>	Bath Product, BB Cream, Body Scrub, Deodorant, Fabric Stain Remover, Face Scrub, Mascara, Shampoo
<i>Sodium polyacrylate</i>	Body Scrub, Dishwasher cleaner, Face Mask, Face Scrub, Foot Scrub, Mascara, Laundry detergent, Moisturiser, Multipurpose cleaner, Serum, Shampoo, Shaving Product, Sunscreen Washing machine cleaner
<i>Sulfonated Polyethylene/Polyethylene Terephthalate</i>	Laundry Detergent
<i>Sulfonated Polymer</i>	Dishwasher Cleaner, Washing Machine Cleaner
<i>Synthetic beeswax</i>	Face Scrub, Mascara
<i>Synthetic wax</i>	Body Scrub, Face Scrub, Hand Scrub, Sunscreen
<i>Taurate/Vp Copolymer</i>	CC Cream, Face Mask, Face Scrub, Shaving Product
<i>VA/Crotonates/ Vinyl Neodecanoate Copolymer</i>	Hairspray
<i>Vinyl Dimethicone/Methicone Silsesquioxane Crosspolymer</i>	BB Cream
<i>VP/DMAPA acrylates copolymer</i>	Shampoo
<i>VP/Eicosene Copolymer</i>	Lipstick, Mascara
<i>VP/Hexadecene Copolymer</i>	Lipstick, Mascara
<i>VP/Methacrylamide/Vinyl imidazole copolymer</i>	Shampoo
<i>VP/VA copolymer</i>	Shampoo

REFERENCES

¹ Leslie, H. A. (2014). Review of Microplastics in Cosmetics. Report to the Dutch Ministry of Infrastructure and the Environment. The Hague, Netherlands. http://www.ivm.vu.nl/en/Images/Plastic_ingredients_in_Cosmetics_07-2014_FINAL_tcm234-409859.pdf

² UNEP (2015). Plastic in Cosmetics.

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³ Ooms, J., Landman, H., Politiek, E. T., Van Bruggen, R. P. and Joosten, E. A. (2015) Test to assess and prevent the emission of primary synthetic microparticles (primary microplastics). Report for DG Environment, FPS Health, Food Chain Safety and Environment, Belgium. Tauw BV: Deventer, The Netherlands.

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