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RECOVERED POLYMER SPECIFICATIONS

ANZPAC PLASTICS PACT

PLASTICS PACT

Acknowledgements

The development of the specifications was funded by APCO, with the specifications released under the ANZPAC Plastics Pact. APCO acknowledges the support of NWRIC, Australian Institute of Packaging, Australian Food and Grocery Council, Chemistry Australia and industry experts that contributed to the development of the specifications.

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Contents

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Introduction

This document, developed as part of the Australian Packaging Covenant Organisation (APCO) FY21 Priority Projects, provides a set of standard specifications for recycled materials suitable for manufacture into packaging. The project focused on recovered polymer specifications as these were considered the most complex challenge for packaging. APCO, as the lead organisation for the Australian, New Zealand and Pacific Islands Plastics Pact (ANZPAC), identified the specifications as relevant within the ANZPAC context as an important tool for maximising plastics recovery, value and return on investment.
An initial set of 12 voluntary recovered polymer specifications have been prepared to assist companies involved in the sorting and processing of recovered plastic packaging. Separate specifications have been developed for two key stages in the recovery process (see Figure 1):

Sorting (i.e., at Materials Recovery Facilities (MRFs) and other sorters) to supply baled plastics.

Processors (i.e., plastic recycling facilities) to supply flake to plastic converters.

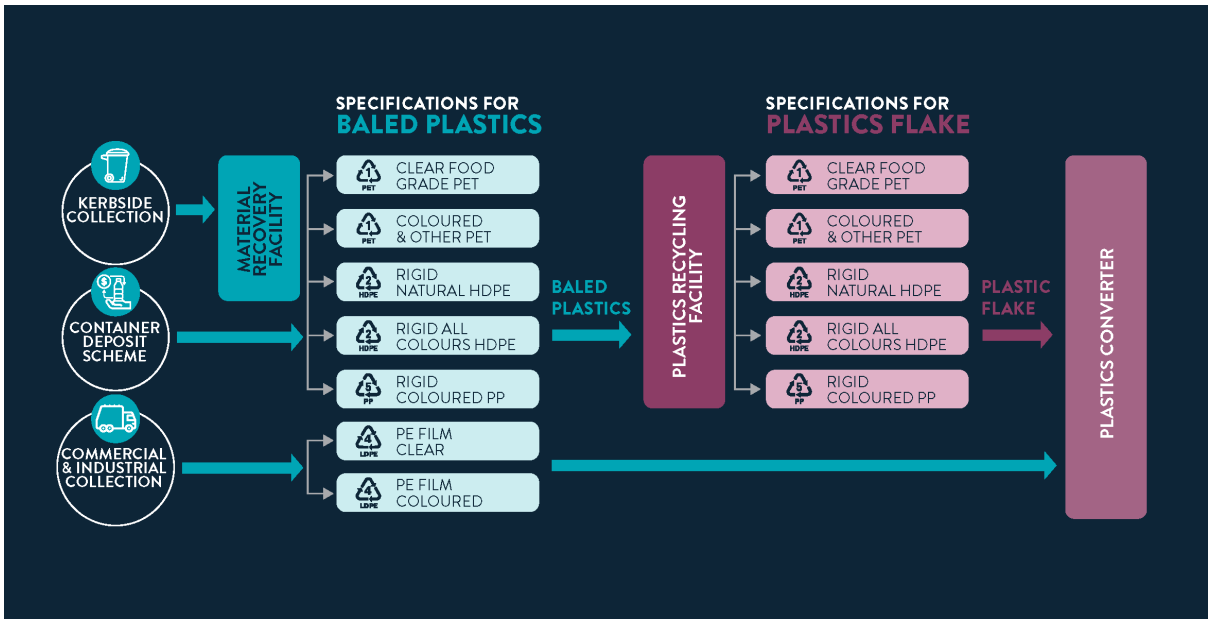

Figure 1: *Recovered Polymer Specifications Overview*

How the specifications were developed

The recovered polymer specifications were developed by APCO as an initiative of the 2020 APCO Materials Circularity Working Group. Brand Owner APCO Members had raised concerns that achieving the 2025 National Packaging Targets for recycled content would require a stronger focus on quality standards throughout the value chain, from packaging design through to recovery, to ensure that recovered materials could meet specifications for manufacture back into packaging.

A series of meetings were held with key government and industry stakeholders to ensure that the specifications would support and align with other related initiatives. These initiatives are summarised in Table 1.

In late 2020, APCO developed the specifications in consultation with experts along the packaging supply chain, from manufacturers through to sorters and reprocessors. The specifications are based on existing national (e.g., Australian Council of Recycling (ACOR)) and international (e.g., Institute of Scrap Recycling Industries (ISRI) and Plastic Recyclers Europe) specifications, standards, market trends, quality, equipment and processes.

The National Waste and Recycling Industry Council (NWRIC) was a key partner in the project and assisted in gathering input from MRF operators and recyclers.

Table 1: *Stakeholders involved in standards and specifications for recovered materials*

Organisation	Interest or involvement in standards
Australian Government	The National Waste Policy Action Plan (2019) includes action 3.7: 'Consider national standards for kerbside recycling collection and materials recovery facilities to improve consistency and performance'. The National Plastics Plan (2021) includes 'Work across the plastics recycling supply chain to develop nationally consistent performance standards for material recovery facilities to deliver clean feedstock for remanufacturing'. The Waste Reduction and Recycling Act 2000 regulates the export of waste plastics. To be eligible for an export license a company will need to show that they meet a specification.
CSIRO	CSIRO is developing a major research program to tackle plastic waste including 'establishing recycling standards and best practices to reduce contamination'. CSIRO works in partnership with Chemistry Australia and its Plastics Stewardship Australia program.
State and territory governments	Several jurisdictions are developing standards for kerbside collection including the Victorian Government's 4-bin system and the Western Australian Government's rule changes for kerbside collection in Perth.
National Waste and Recycling Industry Council (NWRIC)	NWRIC is leading a project to update existing, or prepare new, specifications for all recovered materials. NWRIC is also working with the Australian Government and other industry associations to develop national kerbside collection standards.
Australian Food and Grocery Council (AFGC)	AFGC is developing a National Plastics Recycling Scheme, starting with options to utilise more food grade recycled materials back into soft plastics.
Dairy Australia	Dairy Australia is developing a packaging sustainability roadmap for the sector and investigating potential for more food grade recycled content in dairy packaging.
Australian Council of Recycling (ACOR)	ACOR developed the original MRF specifications in 2012 (funded by APCO) which require updating. ACOR is also planning to develop an accreditation program for MRFs with a focus on operational performance.

Use of the specifications

Individual buyers and sellers are encouraged to use the specifications as a guide or reference for trading and negotiation. While not compulsory, buyers and sellers are strongly encouraged to use the specifications as a starting point from which variations or additions may be made for each transaction between the buyer and seller. Any deviations from the specifications should be mutually agreed to and stipulated in writing by both parties. There are likely to be different testing requirements for export that companies need to meet and record for compliance purposes compared to those required by Australian customers.

The specifications may be nominated by exporters when submitting an application for a waste plastic export licence. The Department of Agriculture, Water and the Environment may also consider publishing the specifications on its website as 'listed specifications'. Listed specifications are specifications that have been assessed by the Department as meeting the requirements of the Recycling and Waste Reduction Act 2020 and relevant Rules.

The specifications are designed to maximise recovery and value and meet the needs of customers, whether in Australia or overseas. They will also provide recycling companies with greater clarity on market expectations and buyers' confidence in the quality of material being supplied.

The specifications will be published as editable documents on the ANZPAC Plastics Pact and NWRIC websites, to provide templates that companies can use for their own trading and negotiation purposes. The specifications will also be published in their original form for reference.

Next steps

To further support the recovery of quality recycled packaging materials APCO continues to work with ANZPAC and APCO Members to design out the use of problematic and unnecessary single use plastic packaging, including rigid polystyrene, expanded polystyrene (EPS) and rigid polyvinyl chloride (PVC) to improve the quality of recycled materials provided by sorters and processors to manufacturers.

The specifications will be periodically reviewed to ensure that they remain relevant and up-to-date.

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Specifications for baled clear polyethylene terephthalate (PET) bottles

These generic specifications are for baled clear PET bottles intended to be manufactured into food grade recycled PET (rPET) flake or pellets to US and EU standards in Australia.

The specifications are voluntary and have been prepared to assist Australian primary sorters, such as Material Recovery Facilities (MRFs), by providing recommendations for sorting, storage and transport. It is acknowledged that some MRFs and other sorters will be able to meet these specifications and send high quality bales (with low contamination) direct to plastics reprocessors and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All MRFs and other sorters should seek details from their customers on their specific requirements.

These specifications have been developed in consultation with experts in the sector based on national and international trends in markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands and the contribution of MRF operators, plastics processors and other industry experts in helping prepare these specifications.

Two streams of rigid PET

There are two common streams of rigid PET packaging that have different physical properties and hence different value in Australian and global markets. These specifications are geared to the highest value and most consistent PET waste stream: clear uncoloured PET bottles used for beverages. These specifications do not cover:

- Coloured PET.
- Bottles used for non-food packaging applications i.e., household chemical bottles such as turpentine etc.
- Thermoformed PET trays, clam shells or punnets.

These are to be excluded from bales of food grade PET bottles, as they may contain contaminants that render food grade PET bottles unsuitable for the manufacture of food grade rPET. There are separate specifications in this series for coloured, thermoformed and non-food PET bottles.

PET packaging design

For PET packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: PET Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

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Specifications for baled clear polyethylene terephthalate (PET) bottles

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled clear polyethylene terephthalate (PET) bottles		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Resin type		PET (clear uncoloured bottles).
Product		Used, completely empty, rigid bottles <5L including lids, caps, labels (unless agreed with the customer).
Original source of material		Post-consumer municipal kerbside. Container deposit schemes (CDS). Commercial sources. Pre-consumer industrial.
Suitable applications		Food grade PET packaging. Non-food grade applications.

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Colour		Only clear PET, up to 8% of light blue tinted PET allowed. No opaques (solid colours), no darks, browns, greens, black or white.
PET content (min %)		If sending to an Australian secondary sorter aim for >90% PET by weight or as negotiated. If sending direct to an Australian compounder aim for 98-99% PET or as negotiated.
Impurities		
Total impurities content (max %)		If sending direct to a plastics reprocessor/compounder aim for 98% PET. For other sorters aim for >90% bottle PET with <10% contamination. Unless otherwise specified, the % limits listed below apply to bales being sent to other sorters.
Metals (max %)		Metallic and mineral impurities with an item weight of >100g and cartridges for sealants are not permitted. Other metal articles <0.5% by weight.
Paper/Cardboard (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
PVC (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
Plastic films		<1% by weight.
Transparent colours (max %)		<5% light blue. No dark colours e.g., brown.
Opaque colours (max %)		<0.5% by weight or zero.
PET thermoforms – trays etc. (max %)		<5% by weight.
Other plastics (max %)		<8% (incl HDPE, PP, LDPE as lids or other packaging).
Moisture (max %)		<5% (residue food, liquids, soil, other).
Prohibited impurities		Organics, rubber, wood, sacks, hazardous waste, medical waste, glass, compostable, oxo and bio-degradable material, food contamination, silicone, PET-G, C-PET, PS, textiles.
Non-food contact plastics (max %)		<5% (Chemical, general purpose and non-food applications).

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Transport		
Transport/contract documents		The documents will be provided with the delivered bales.
Tracking		Delivery docket stating source, sorting plant, production date.
Truck load (min. tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.
Bale characteristics		
Bale size/weight		Compacted to 350 kg - 650 kg. Bottles perforated or lids removed. Stable and stackable bales for greater compaction and stability for transport and handling.
Storage		Dry storage on concrete hardstand (no gravel included in bales). Other, please describe.
Strapping		4 - 10 straps and not cross-bound or broken.

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Specifications for polyethylene terephthalate (PET) hot washed flake

These generic specifications have been prepared to assist Australian secondary plastics recycling facilities produce food grade recycled PET (rPET) hot washed flake to US FDA and EU food-contact standards for use in compounding and manufacturing in Australia and overseas. These specifications are voluntary.

There is diversity in the capacity of plastics processing facilities. Some include sorting, hot wash, flake and compounding, and some specialise in compounding and pelletising for manufacturers of packaging and product. All companies should seek specific details from their customers on specific requirements. The test methods in the table below are included for reference.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare these specifications.

Two streams of rigid PET

There are two common streams of rigid PET packaging that have different physical properties and hence different value in Australian and global markets. These specifications are geared to the highest value and most consistent PET waste stream: clear uncoloured PET bottles used for beverages such as water, juice, milk and carbonated soft drinks.
There are separate specifications within this series for coloured, thermoformed and non-food PET bottle flake.

PET packaging design

For PET packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: PET Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

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Specifications for polyethylene terephthalate (PET) hot washed flake

Instruction: Enter responses into the relevant fields as appropriate to your operations, outputs and customers. Some parts of these specifications are more important than others for entry of data for compliance. For example, contamination and colour are more important than density of flake in the bag. Testing methods are suggested (from EU templates); specify if using alternative test methods particularly for export. Testing may not be a required element for Australian customers, but may be required for export licences.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for polyethylene terephthalate (PET) hot washed flake		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Product name		Hot caustic wash flake PET suitable for making bottle food grade rPET.
Product reference		Number xxx
Origin of the materials		Post-Consumer kerbside. Container Deposit Scheme (CDS). Post industrial. Pre-consumer industrial.

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Suitable applications for treated materials		Non-food grade packaging and products. Non-packaging applications.	
Colour		Describe flake colour (natural, blue, no opaque white or brown colours) and % blue.	
Technical Properties		Unit	Test method options
Bulk density		250-500 g/cm^3 or kg/m^3	Annex B ISO 12418-2 or ISO 60
Intrinsic Viscosity (IV)		0.73-0.84 dl/g	ISO 1628-5 or EN ISO 1133
Melting temperature range		245 – 255 °C	ISO 113547-3:2016
Flake size (average)		98% 3-12mm mm	Annex A of EN 15348:2007
Flake distribution (min – max)	_____ % < 1mm _____ % ≥ 12mm	<1mm = 0.5 wt% max. ≥ 12mm = 0.1 wt%	Annex A of EN 15348:2007
Fines		≤ 1.00 weight %	Annex A of EN 15348:2007
Moisture		≤ 1.00 % or lower ie ≤ 0.7 weight %	Moisture Analyser, Muffle oven or TGA weight loss at 105°C, EN ISO 287-2009
Impurities		Impurities visible in flake	Visual inspection
Total impurities content (max %)		**≤ 80 ppm**	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Polyolefins content (PE, PP)		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348

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Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Appearance		Describe if the flake has a normal appearance	Visual inspection
Food contact		Material suitable for food grade applications.	
Transport			
Packaging		Packed in new PP bulk bags, with labelling that includes information that covers: • Product code and name. • Batch number. • Date of manufacture. • Name of manufacturer and production factory. • Gross and tare weight. • Special handling requirements.	
Transport/contract documents		The documents will be provided upon delivery stating quantity, supplier, source, bag IDs.	
Truck load		Tarpaulin truck 17-20 tonne load.	

Specifications for baled coloured and thermoformed polyethylene terephthalate (PET)

These generic specifications are for separating translucent coloured PET bottles and clear thermoform trays for the purposes of making coloured recycled PET (rPET) flake or pellets to US and EU standards in Australia.

These specifications are voluntary and have been prepared to assist Australian primary sorters, such as Material Recovery Facilities (MRFs), by providing recommendations for sorting, storage and transport.

It is acknowledged that some MRFs and sorters will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors/compounders, and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All MRFs and other sorters should seek details from their customers on their specific requirements.

These specifications have developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Two streams of rigid PET

There are two common streams of rigid PET packaging that have different physical properties and hence different value in the Australian and global markets. These specifications are geared to coloured PET bottles and thermoformed PET.
These specifications cover:

- Coloured PET that may be used for non-food packaging applications i.e., household chemical bottles e.g., turpentine etc.
- Thermoformed PET trays, clam shells and punnets.

For clear uncoloured PET bottles refer to the other specifications within this series.

PET packaging design

For PET packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: PET Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for baled coloured and thermoformed polyethylene terephthalate (PET)

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled coloured and thermoformed polyethylene terephthalate (PET)		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Resin		PET (translucent coloured bottles and thermoform).
Product		Used, completely empty, rigid bottles <5L including lids, caps, labels (unless agreed with the customer).
Original source of material		Post-consumer municipal kerbside. Container deposit schemes. Commercial sources. Pre-consumer industrial.
Suitable applications		Food grade PET packaging. Non-food grade applications.

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Colour	____% mixed coloured; ____% black articles/layers	Any colour. No opaques (solid colours). If you are able to specify the % black and the % coloured do so.
PET content (min %)		If sending to an Australian secondary sorter aim for >90% PET by weight or as negotiated. If sending direct to an Australian compounder aim for 98-99% PET or as negotiated.
Impurities		
Total impurities content (max %)		If sending direct to a plastics reprocessor/compounder aim for 98% PET. For other sorters aim for >90% bottle PET with **<10%** contamination. Unless otherwise specified, the % limits listed below apply to bales being sent to other sorters.
Metals (max %)		Metallic and mineral impurities with an item weight of >100g and cartridges for sealants are not permitted. Other metal articles <0.5% by weight.
Paper/Cardboard (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
PVC (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
Plastic films		<1% by weight.
Other plastics (max %)		<8% (incl HDPE, PP, LDPE as lids or other packaging).
Moisture (max %)		<5% (residue food, liquids, soil, other).
Prohibited impurities		Organics, rubber, wood, hazardous waste, medical waste, glass, compostable, oxo and bio-degradable materials, food contamination, silicone, PET-G, C-PET, PS, textiles.
Transport		
Transport/contract documents		The documents will be provided with the delivered bales.
Tracking		Delivery docket stating source, sorting plant, production date.

Truck load (min, tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.
Bale characterisations		Stable and stackable bales.
Bale size/weight		Compacted to 350 kg - 650 kg. Bottles perforated or lids removed. Stable and stackable bales for greater compaction and stability for transport and handling.
Storage		Dry storage on concrete hardstand (no gravel included in bales). Other, please describe.
Strapping		4 - 10 straps and not cross-bound or broken.

Specifications for coloured polyethylene terephthalate (PET) cold washed flake

These generic specifications have been prepared to assist Australian secondary plastics treatment facilities produce coloured recycled PET (rPET) flake or pellets to US and EU standards in Australia and overseas for non-food applications. These specifications are voluntary.

There is diversity in the capacity of plastics processing facilities. Some include sorting, hot wash or cold wash, flake and compounding, and some specialise in compounding and pelletising for manufacturers of packaging and products. All companies should seek details from their customers on their specific requirements. The test methods in the table below are included for reference.

These specifications have been developed in consultation with experts in the sector on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Two streams of rigid PET

There are two common streams of rigid PET packaging that have different physical properties and hence different value in the Australian and global markets. These specifications are geared to coloured and thermoformed PET.

These specifications cover:

- Coloured PET that may be used for non-food packaging applications i.e., household chemical bottles e.g., turpentine etc.
- Thermoformed PET trays, clam shells and punnets.

For clear uncoloured PET bottles refer to the other specifications within this series.

PET packaging design

For PET packaging design, the following resources are available:

- Quickstart Guide to Designing for Recyclability: PET Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

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Specifications for coloured polyethylene terephthalate (PET) cold washed flake

Instructions: Enter responses into the relevant fields as appropriate to your operations, outputs and customers. Some parts of these specifications are more important than others for entry of data for compliance. For example, contamination and colour are more important than density of flake in the bag. Testing methods are suggested (from EU templates); specify if using alternative test methods particularly for export. Testing may not be a required element for Australian customers, but may be required for export licences.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for coloured polyethylene terephthalate (PET) cold washed flake		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Product name		Cold wash flake PET.
Product reference		Number xxx.
Origin of the materials		Post-consumer kerbside. Container Deposit Scheme (CDS). Post-industrial. Pre-consumer industrial.

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Suitable applications for treated materials		Non-food grade packaging and products. Non-packaging applications.	
Colour		Describe flake colour (natural, blue, no opaque colours).	
Technical Properties		Unit	Test method options
Bulk density		250-500 g/cm^3 or kg/m^3	Annex B ISO 12418-2 or ISO 60
Intrinsic Viscosity (IV)		0.73-0.84 dl/g	ISO 1628-5 or EN ISO 1133
Melting temperature range		245 – 255 °C	ISO 113547-3:2016
Flake size (average)		98% 3-12mm mm	Annex A of EN 15348:2007
Flake distribution (min – max)	____% < 1mm ____% ≥ 12mm	<1mm = 0.5 wt% max. ≥ 12mm = 0.1 wt%	Annex A of EN 15348:2007
Fines		≤ 1.00 weight %	Annex A of EN 15348:2007
Moisture		≤ 1.00 % or lower ie ≤ 0.7 weight %	Moisture Analyser, Muffle oven or TGA weight loss at 105°C, EN ISO 287-2009
Impurities		Impurities visible in flake	Visual inspection
Total impurities content (max %)		**≤ 80 ppm**	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Polyolefins content (PE, PP)		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348

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Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Appearance		Describe if the flake has a normal appearance	Visual inspection
Transport			
Packaging		Packed in new PP bulk bags, with labelling that includes information that covers: • Product code and name. • Batch number. • Date of manufacture. • Name of manufacturer and production factory. • Gross and tare weight. • Special handling requirements.	
Transport/contract documents		The documents will be provided upon delivery stating quantity, supplier, source, bag IDs.	
Truck load		Tarpaulin truck 17-20 tonne load.	

Specifications for baled rigid high density polyethylene (HDPE) natural food grade

These generic specifications are for separating natural HDPE food grade packaging for the purpose of making recycled HDPE (rHDPE) flake or pellets to US and EU food grade standards in Australia. These specifications are voluntary and have been prepared to assist Australian primary sorters, such as Material Recovery Facilities (MRFs), by providing recommendations for sorting, storage and transport.

It is acknowledged that some MRFs and sorters will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors, and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may be able to send substantially more mixed plastics than included in these specifications. All MRFs and other sorters should seek details from their customers on specific requirements. It is possible international export requirements will become more stringent for single polymer batches and testing/certification.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Rigid HDPE natural and colour

HDPE is best separated into two streams:

1. Natural food grade drink bottles (milk, cream, juice and water).
2. All other colours and formats (including natural non-food grade bottles).

Only natural HDPE drink bottles can be reprocessed back into high value food grade HDPE. Coloured HDPE and natural non-drink bottle HDPE cannot be reprocessed for food applications and are generally processed to make pipe and similar robust products. Sorters and processors are encouraged to keep the two streams separate to achieve higher quality and value.

These specifications are for food grade natural HDPE bottles. Use the other HDPE specifications within this series for coloured and mixed HDPE.

HDPE packaging design

For HDPE packaging design, the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid HDPE Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for baled rigid high density polyethylene (HDPE) natural (unpigmented) food grade

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled rigid high density polyethylene (HDPE) natural (unpigmented) food grade		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Resin type		HDPE
Product		99% food grade HDPE - used, completely empty, rigid bottles <5L (milk, cream, juice and drinking water only).
Suitable applications for treated material		Food grade packaging and products. Non-food grade-packaging applications.
Original source of the materials		Post-consumer kerbside. Post industrial.

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		Pre-consumer industrial.	
Colour		100% natural. Incidental colour from caps and labels only. No coloured bottles.	
Impurities			
Total impurities content (max. %)		≤ 80 ppm	
Metals (max %)		Metallic and mineral impurities with an item weight of >100g and cartridges for sealants are not permitted. Other metal articles <0.5% by weight.	
Paper/Cardboard (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
PET/PS content		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Prohibited impurities	**_____ % total impurities**	Minerals, rubber, wood, hazardous waste, medical waste, glass, compostable, oxo- & biodegradable material, food contamination, silicones, foams, PUR, textiles, EPS, XPS.	
Transport			
Transport/contract documents		The documents will be provided with the delivered bales.	
Tracking		Delivery docket stating source, sorting plant, production date.	
Truck load (min, tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.	

Bale characteristics		
Bale size/weight		Compacted to 350 kg - 650 kg. Bottles perforated or lids removed. Stable and stackable bales for greater compaction and stability for transport and handling.
Storage		Dry storage on concrete hardstand (no gravel included in bales). Other, please describe.
Strapping		4 - 10 straps and not cross-bound or broken.

CONTACT:
A: Suite 1102, Level 11, 55 Clarence Street, Sydney, NSW, 2000
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Specifications for natural high density polyethylene (HDPE) flake for food grade applications

These generic specifications have been prepared to assist Australian secondary plastics treatment facilities produce natural food grade HDPE washed flake for use in compounding and manufacturing in Australia and overseas. These specifications are geared to using food grade HDPE to make food grade recycled HDPE (rHDPE) for use in food packaging applications. These specifications are voluntary.

There is diversity in plastics processing plant capacity in Australia. Some include sorting, hot wash or cold wash, flake and compounding, whereas some specialise in compounding and pelletising for customers making packaging and products. All companies should seek details from their customers on their specific requirements. The test methods in the table below are included for reference and other test methods can be used.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Rigid HDPE natural and colour

HDPE is best separated into two streams:

1. Natural food grade drink bottle (milk, cream, juice and water).
2. All other colours and formats (including natural non-food grade bottle).

Only natural HDPE drink bottles can be reprocessed back into high value food grade HDPE. Colour HDPE and natural non-drink bottle HDPE cannot be reprocessed for food applications, and are generally processed to make pipe and similar robust products. Sorters and processors are encouraged to keep the two streams separate to achieve higher quality and value.

These specifications are for food grade natural HDPE bottles. Use the other HDPE specifications within this series for coloured and mixed HDPE.

HDPE packaging design

For HDPE packaging design, the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid HDPE Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for natural (unpigmented) high density polyethylene (HDPE) flake for food grade applications

Instruction: Enter responses into the relevant fields as appropriate to your operations, outputs and customers. Some parts of these specifications are more important than others for entry of data for compliance, for example contamination and colour are more important than density of flake in the bag. Testing methods are suggested (from EU templates); specify if using alternative test methods particularly for export. Testing may not be a required element for Australian customers and may be required for export licences.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for natural (unpigmented) high density polyethylene (HDPE) flake for food grade applications		
	Enter data in this column	Good practice / description of options for responses
Characteristics		
Product name		HDPE hot caustic wash flake.
Product reference		Number xxx.
Suitable applications for treated material		Food grade packaging and products. Non-food grade-packaging applications.
Origin of the materials		Post-consumer kerbside. Post-industrial. Pre-consumer industrial.

CONTACT:
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E: anzpac@apco.org.au

Colour		Describe flake colour (light to blue, transparent and opaque and % black).	
Technical Properties		Unit	Optional test methods
Bulk density		0.950 – 0.965 g/cm^3	ISO 60
Melting temperature range		245 – 255 °C	ISO 113547-3:2016
Melt flow rate		g/10min	EN ISO 1133-1:2011
Fines		≤ 1.00 weight %	Annex A of EN 15348:2007
Flake size (average)		98% 8-12 mm	EN 15345:2007
Flake distribution (min – max)	_____ % < 1mm _____ % ≥ 12mm	<1mm = 0.5 wt% max. ≥ 12mm = 0.1 wt%	EN 15345:2007
Moisture		≤ 1.00 % or lower ie ≤ 0.7 weight %	Moisture Analyser / infrared heater or TGA EN ISO 11358-1:2014
Impurities		impurities visible in flake	Visual inspection
Total impurities		≤ 80 ppm	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
PET/PS content		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Appearance			Visual inspection

		Describe if the flake has a normal appearance	
Food contact		Material suitable for food grade applications if >99% (by mass) natural milk, juice and drinking water bottles in origin.	
Transport			
Packaging		In PP bulk bags, ID marked with batch number, source, supply chain, production date.	
Transport/contract documents		The documents will be provided upon delivery stating quantity, supplier, source, bag IDs.	
Truck load		Tarpaulin truck 17-20 tonne load.	

Specifications for baled rigid high density polyethylene (HDPE) - all colours

These generic specifications are for separating coloured HDPE packaging for the purposes of making rHDPE flake or pellets to US and EU standards in Australia.

These specifications are voluntary and have been prepared to assist Australian primary sorters, such as Material Recovery Facilities (MRFs), by providing recommendations for sorting, storage and transport.

It is acknowledged that some MRFs and sorters will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors/compounders, and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All MRFs and other sorters should seek details from their customers on their specific requirements.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Rigid HDPE natural and colour

HDPE is best separated into two streams:

1. Natural food grade drink bottles (milk, cream, juice and water).
2. All other colours and formats (including natural non-food grade bottles).

Only natural HDPE drink bottles can be reprocessed back into high value food grade HDPE. Coloured HDPE and natural non-drink bottle HDPE cannot be reprocessed for food applications and are generally processed to make pipe and similar robust products. Sorters and processors are encouraged to keep the two streams separate to achieve higher quality and value.

These specifications are for coloured and mixed HDPE. Use the other HDPE specifications within this series for food grade natural HDPE bottles.

HDPE packaging design

For HDPE packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid HDPE Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for baled rigid high density polyethylene (HDPE) - all colours

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled rigid high density polyethylene (HDPE) - all colours		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Resin type		HDPE.
Product		Bottles HDPE <5L. All colours and formats including natural non-food containers.
Original source of material		Post-consumer municipal kerbside. Container deposit schemes. Commercial sources. Pre-consumer industrial.
Suitable applications		Non-food grade PE product/packaging.
Colour and black	_____% mixed coloured; _____% black articles/layers	Mixed coloured (> 95% mixed & coloured HDPE). Specify the percentage % of black articles or articles with black layers.

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PE-HD content (min %)		If sending to an Australian secondary sorter aim for >90% HDPE by weight or as negotiated. If sending direct to an Australian compounder aim for 98-99% HDPE or as negotiated.
Impurities		
Total impurities content (max %)		If sending direct to a plastics reprocessor/compounder aim for 98% HDPE. For other sorters aim for >90% bottle HDPE with **<10%** contamination. Unless otherwise specified, the % limits listed below apply to bales being sent to other sorters.
Metals (max %)		Metallic and mineral impurities with an item weight of >100g and cartridges for sealants are not permitted. Other metal articles <0.5% by weight.
Paper/Cardboard (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
PVC (max %)		< 0.5% by weight if sending to compounders. < 1% by weight if sending to other sorters.
Plastic films		<1% by weight.
PP (max %)		Dimensionally stable PP articles up to 10% of weight.
Other plastics (max %)		<5% (incl PET).
Moisture sources (max %)		<5% (Residue food, liquids, soil, other).
Prohibited impurities		Organics, rubber, wood, hazardous waste, medical waste, glass, compostable, oxo- & bio-degradable material, food contamination, silicones, foams, PUR, textiles, EPS, XPS.
Transport		
Transport/contract documents		The documents will be provided with the delivered bales.
Tracking		Delivery docket stating source, sorting plant, production date.
Truck load (min, tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.

Bale characterisations		
Bale size/weight		Compacted to 350 kg - 650 kg. Bottles perforated or lids removed. Stable and stackable bales for greater compaction and stability for transport and handling.
Storage		Dry storage on concrete hardstand (no gravel included in bales). Other, please describe.
Strapping		4 - 10 straps and not cross-bound or broken.

CONTACT:
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Specifications for coloured high density polyethylene (HDPE) flake

These generic specifications have been prepared to assist Australian secondary plastics treatment facilities produce coloured HDPE hot washed flake for use in compounding and manufacturing in Australia and overseas. These specifications are geared to using 'jazz' multi-coloured HDPE to make quality recycled HDPE (rHDPE). These specifications are voluntary.

There is diversity in plastics processing plant capacity in Australia. Some include sorting, hot wash or cold wash, flake and compounding, whereas some specialise in compounding and pelletising for customers making packaging and products. All companies should seek details from their customers on their specific requirements. The test methods in the table below are included for reference and other test methods can be used.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Rigid HDPE natural and colour

HDPE is best separated into two streams:

1. Natural food grade drink bottles (milk, cream, juice and water).
2. All other colours and formats (including natural non-food grade bottles).

Only natural HDPE drink bottles can be reprocessed back into high value food grade HDPE. Colour HDPE and natural non-drink bottle HDPE cannot be reprocessed for food applications and are generally processed to make pipe and similar robust products. Sorters and processors are encouraged to keep the two streams separate to achieve higher quality and value.

These specifications are for coloured and mixed HDPE. Use the other HDPE specifications within this series for food grade natural HDPE bottles.

HDPE packaging design

For HDPE packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid HDPE Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for coloured high density polyethylene (HDPE) flake

Instruction: Enter responses into the relevant fields as appropriate to your operations, outputs and customers. Some parts of these specifications are more important than others for entry of data for compliance. For example, contamination and colour are more important than density of flake in the bag. Testing methods are suggested (from EU templates); specify if using alternative test methods particularly for export. Testing may not be a required element for Australian customers, but may be required for export licences.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for coloured high density polyethylene (HDPE) flake		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Product name		HDPE flake (hot caustic wash or cold wash).
Product reference		Number xxx.
Origin of the materials		Post-consumer kerbside. Container Deposit Scheme (CDS). Post industrial. Pre-consumer industrial.
Suitable applications for treated material		Non-food grade packaging and products. Non-packaging applications.

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Colour		Describe flake colour (light to dark, transparent and opaque and % black).	
Technical Properties		Unit	Optional test methods
Bulk density		0.950 – 0.965 g/cm^3	ISO 60
Melting temperature range		245 – 255 °C	ISO 113547-3:2016
Melt flow rate		g/10min Specify whether tested with 2.16 kg, 5 kg and/or 21.6 kg weight - 2.16 kg the most useful.	EN ISO 1133-1:2011
Fines		≤ 1.00 weight %	Annex A of EN 15348:2007
Flake size (average)		98% 8-12 mm	EN 15345:2007
Flake distribution (min – max)	_____ % < 1mm _____ % ≥ 12mm	<1mm = 0.5 wt% max. ≥ 12mm = 0.1 wt%	EN 15345:2007
Moisture		≤ 1.00 % or lower ie ≤ 0.7 weight %	Moisture Analyser / infrared heater or TGA EN ISO 11358-1:2014
Impurities		Impurities visible in flake	Visual inspection
Total impurities		≤ 80 ppm	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other plastics (PET/PS) **content**		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348

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Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
PP (max %)		≤ 10%	
Appearance		Describe if the flake has a normal appearance	Visual inspection
Food contact		Material not suitable for food grade applications.	
Transport			
Packaging		In PP bulk bags, ID marked with batch number, source, supply chain, production date.	
Transport/contract documents		The documents will be provided upon delivery stating quantity, supplier, source, bag IDs.	
Truck load		Tarpaulin truck 17-20 tonne load.	

Specifications for baled coloured polypropylene (PP)

These generic specifications are for separating PP from other polymers for the purposes of making quality PP packaging and product. It also flags the opportunity within a few years to separate PP by colour and package type to produce food grade recycled PP (rPP) flake to US and EU standards in Australia.

These specifications are voluntary and have been prepared to assist Australian primary sorters, such as Material Recovery Facilities (MRFs), by providing recommendations for sorting, storage and transport.

It is acknowledged that some MRFs and sorters will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors, and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All MRFs and other sorters should seek details from their customers on their specific requirements.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Types of rigid PP

Rigid PP is the third most used plastic in packaging in Australia. It is increasingly used in packaging for food, cleaning products and commercial scale containers. Sorters are encouraged to take account of growing trends to improve PP sorting and processing to recover the following:

- PP natural (clear) such as takeaway and lunch containers, storage boxes and some meat trays.
- PP white or coloured such as ice cream, yoghurt and margarine tubs, and some meat trays.

Other PP products with a potential end market include cleaning products, buckets and commercial scale containers.

PP packaging design

For PP packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid PP Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for baled coloured polypropylene (PP)

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled coloured polypropylene (PP)		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Resin		PP
Product		Rigid Injection moulded or thermoform packaging – ice cream, butter, takeaway food containers, caps and closures.
Original source of materials		Post-consumer municipal kerbside. Container Deposit Schemes (CDS). Commercial sources. Pre-consumer industrial.

Suitable applications		Non-food contact PP packaging/product.
Colour	_____ % coloured _____ % clear	All colours and clear translucent PP. If you are able to specify the % clear and the % coloured do so.
PP content (min %)		If sending to an Australian secondary sorter aim for >94-90% PP by weight or as negotiated. If sending direct to an Australian compounder aim for 98-99% PP or as negotiated.
Impurities		
Impurities content (max %)		If sending direct to a plastics reprocessor/compounder aim for 98% PP by weight. For other sorters aim for >90% bottle PP with <10% contamination by weight. Unless otherwise specified, the % limits listed below apply to bales being sent to other sorters.
Glass		<0.1% by weight.
Paper/Card		<0.5% by weight.
Metals (max %)		<0.1% by weight.
Plastic films		<1% by weight.
PE rigid plastics		<5% PE rigid by weight (less PE will greatly improve the value of the bale).
Other plastics / Fines / Trash (max %)		<5% (incl PET, PS PVC, laminated plastics).
Moisture (max %)		<5% (residue food, liquids, other).
Prohibited impurities		Organics, rubber, wood, sacks, hazardous waste, medical waste, glass, oxo or degradable material, food contamination, silicone, PET-G, C-PET, PS, textiles.
Non-food contact (max %)		

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Transport		
Transport/contract documents		The documents will be provided with the delivered bales.
Tracking		Delivery docket stating source, sorting plant, production date.
Truck load (min, tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.
Bale characteristics		
Bale size/weight		Compacted to 350 kg - 650 kg. Bottles perforated or lids removed. Stable and stackable bales for greater compaction and stability for transport and handling.
Storage		Dry storage on concrete hardstand (no gravel included in bales). Other, please describe.
Strapping		4 - 10 straps and not cross-bound or broken.

Specifications for cold washed coloured recycled polypropylene (rPP) flake

These generic specifications have been prepared to assist Australian secondary plastic sorters by providing recommended standards on sorting quality, storage and transport. These specifications are geared to making quality coloured recycled PP (rPP) packaging and product using 'jazz' multi-coloured rPP. It also flags the opportunity within coming years to separate PP by colour and package type to produce food grade rPP flake to US and EU standards for use in Australia and overseas. These specifications are voluntary.

There is diversity in the capacity of plastics plants. Some include sorting, cold and hot wash, flake and compounding, and some specialise in compounding and pelletising for manufacturers of packaging and product. All companies should seek details from their customers on their specific requirements. The test methods are included for reference.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of Material Recovery Facility (MRF) operators, plastics processors and other industry experts in helping prepare this generic specification.

Types of rigid PP

Rigid PP can be divided into clear and translucent, and opaque coloured PP. Both have market growth potential in Australia and overseas. These specifications are geared to all rigid PP packaging. Companies can separate clear from coloured if they wish to meet market demand and adjust these specifications accordingly.

PP packaging design

For PP packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Rigid PP Packaging
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines

To download these specifications click here

Specifications for cold washed coloured flake recycled polypropylene (rPP)

Instruction: Enter responses into the relevant fields as appropriate to your operations, outputs and customers. Some parts of these specifications are more important than others for entry of data for compliance. For example, contamination and colour are more important than density of flake in the bag. Testing methods are suggested (from EU templates); specify if using alternative test methods particularly for export. Testing may not be a required element for Australian customers, but may be required for export licences.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for cold washed coloured flake recycled polypropylene (rPP)		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Product name		Mixed colour rPP – cold or hot caustic washed flake.
Product reference		Number xxx.
Origin of the materials		Post-consumer kerbside. Container Deposit Scheme (CDS). Post-industrial. Pre-consumer industrial.

Suitable applications for treated material		Non-food grade packaging and products. Non-packaging applications.	
Colour	_____ % coloured _____ % clear	Coloured PP (includes transparent coloured); clear and transparent PP; specific mix or exclusions. If you are able to specify the % clear and the % coloured do so.	
Technical Properties		Unit	Test method
Bulk density		0.3 – 0.5 g/cm^3	Annex B ISO 12418-2 or ISO 60
Melting temperature range		140 - 170°C	ISO 113547-3:2016
Flake size (average)		98% 8-12mm	Annex A of EN 15348:2007
Flake distribution (min – max)	_____ % < 1mm _____ % ≥ 12mm	<1mm = 0.5 wt% max. ≥ 12mm = 0.1 wt%	Annex A of EN 15348:2007
Fines		≤ 1.00 weight %	Annex A of EN 15348:2007
Moisture		≤ 0.7 % weight	Moisture Analyser, Muffle oven or TGA weight loss at 105°C, EN ISO 287-2009
Impurities			
Total impurities		≤ 80 ppm	
PVC content		≤ 50 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Glass		< 0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other plastics (PET, PE, PS)		≤ 25 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Metal content		≤ 20 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Paper content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Wood content		0 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348
Other contaminants		≤ 10 ppm	Annex A of ISO 12418-2:2012 or Annex D of DIN EN 15348

Appearance		Mixed colour Flake	Visual inspection
Food contact		Material not suitable for food grade applications.	
Transport			
Packaging		In PP bulk bags, ID marked with batch number, source, supply chain, production date.	
Transport/contract documents		The documents will be provided upon delivery stating quantity, supplier, source, bag IDs.	
Truck load		Tarpaulin truck 17-20 tonne load.	

Specifications for baled clear polyethylene (PE) film

These generic specifications are for separating clear film (predominantly low density polyethylene (LDPE) pallet wrap) for the purposes of making polyethylene (PE) pellets to US and EU standards in Australia.

These specifications are voluntary and have been prepared to assist Australian primary sorters by providing recommendations for sorting, storage and transport.

It is acknowledged that some companies will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All sorters should seek details from their customers on their specific requirements.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of Material Recovery Facility operators, plastics processors and other industry experts in helping prepare this generic specification.

Three streams of film: clear and coloured PE film, and other polymers

Flexible film can be complicated by the diversity of types. These specifications aim to make it easier. The most common coloured and printed films are agricultural wrap and consumer shrink packaging made of PE (LDPE, linear low density polyethylene (LLDPE) or high density polyethylene (HDPE)).

These types of PE are compatible and should be sorted into two streams: (1) coloured and printed and (2) clear. PE films carrying print, even if the base polymer is clear, should be mixed with coloured film; not with clear. The small fraction of other polymers such as PP blends should be kept separate, and these specifications do not cover that small proportion.

These specifications are for clear PE film. There are separate generic specifications for recovered coloured/printed PE film in this series.

PE packaging design

For PE film packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Household Consumer Soft Plastics
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines
- CEFLEX

To download these specifications click here

CONTACT:
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Specifications for baled clear polyethylene (PE) film

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled clear polyethylene (PE) film		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Resin		LDPE, LLDPE or HDPE
Product		Stretch Film (<20µm), Shrink Film (<20µm), Pallet Covers (20µm< x < 90µm), Thin Film (<90µm), Thick Film (>90µm).
Original source of material		Commercial & Industrial, Household, Agricultural, Construction & Demolition, Transport, Retail, Others (specify).
Suitable applications		Film production – high grade. Manufactured product – medium grade. Cement and road base – low grade.
Colour	_____% mixed coloured;	Clear and translucent share vs coloured: 98/2%, 90/10%, 80/20%, 70/30%, 60/40% and 50/50%, 40/50%, 30/70%, 10/90% & 2/98%.

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	_____% black/white agricultural film	If you are able to specify the % mixed coloured and the % black/white agricultural film please do so.
LDPE content (min %)		If known, show % of each type of PE in these, if not known state unknown. The mix is more likely to be known for pre-consumer (industrial) waste.
LLDPE content (min %)		
HDPE content (min %)		
Impurities		
Total impurities content (max %)		8% by weight.
Metals (max %)		Metallic & mineral impurities with an item weight of >100g are not permitted. Other metal articles <0.1% by weight.
Paper/Cardboard (max %)		< 1% by weight.
PVC (max %)		< 1% by weight.
Rigids (max %)		Dimensionally stable articles < 1% of weight.
Other plastics such as string / ropes, (max %)		< 2% by weight, incl PET, PP.
Moisture sources (max %)		<5% (Residue food, liquids, soil, other).
Prohibited impurities		Hazardous waste, medical waste, glass, organics, oxo or degradable material, food contamination, silicone, EPS & PUR.
Transport		
Transport/contract documents		The documents will be provided with the delivered bales.
Tracking		Delivery docket stating source, sorting plant, production date.
Truck load (min, tonne)		Tarpaulin truck 17-22 tonne load. Compacted consistent weight/size bales per delivery, ideally sized for pallets, double stacked across truck tray.

Bale characteristics		
Bale size/weight		Compacted Bales – 350 - 650kg.
Storage		Dry storage on concrete hardstand (so no gravel included in bales).
Strapping		4 - 10 straps and not cross-bound or broken.

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Specifications for baled coloured polyethylene (PE) film

These generic specifications are for separating clear from coloured film (e.g., stretch wrap from agricultural wrap) for the purposes of PE pellets to US and EU standards in Australia. Companies may send mixed film to a sorter for attention. These specifications are geared to source separated coloured film.

These specifications are voluntary and have been prepared to assist Australian primary sorters by providing recommendations for sorting, storage and transport.

It is acknowledged that some Material Recovery Facilities (MRFs) and sorters will be able to meet these various specifications and send high quality bales (with low contamination) direct to plastics reprocessors/compounders, and others will need to send their baled plastics to other sites for further sorting. Companies sending baled plastics for further sorting may send substantially more mixed plastics than included in these specifications. All sorters should seek details from their customers on their specific requirements.

These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. We acknowledge Plastics Recyclers Europe for the generic template, specifications from The Netherlands, and the contribution of MRF operators, plastics processors and other industry experts in helping prepare this generic specification.

Three streams of film: clear and coloured PE film, and other polymers

Flexible film can be complicated by the diversity of types. These specifications aim to make it easier. The most common coloured and printed films are agricultural wrap and consumer shrink packaging made of PE (low density polyethylene (LDPE), linear low density polyethylene (LLDPE) or high density polyethylene (HDPE)).

These types of PE are compatible and should be sorted into two streams: (1) coloured and printed and (2) clear. PE films carrying print, even if the base polymer is clear, should be mixed with coloured film; not with clear. The small fraction of other polymers such as PP blends should be kept separate, and these specifications do not cover that small proportion.

These specifications are for coloured PE film. There are separate generic specifications for recovered clear PE film in this series.

PE packaging design

For PE film packaging design the following resources are available:

- Quickstart Guide to Designing for Recyclability: Household Consumer Soft Plastics
- Action Plan for Problematic and Unnecessary Single-Use Plastic Packaging
- Sustainable Packaging Guidelines
- CEFLEX

To download these specifications click here

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Specifications for baled coloured polyethylene (PE) film

Instruction: Enter responses into the middle column as appropriate to your operations, outputs and customers. Strike out any characteristics and descriptions that are not relevant.

Supplier information	
Company name	
Company address	
Additional sorting information	
Date	

Specifications for baled coloured polyethylene (PE) film		
	Enter data & response here	Good practice / description of options for responses
Characteristics		
Resin		LDPE, LLDPE or HDPE
Product		Stretch Film (<20µm), Shrink Film (<20µm), Pallet Covers (20µm< x < 90µm), Thin Film (<90µm), Thick Film (>90µm).
Original source of material		Commercial & Industrial, Household, Agricultural, Construction & Demolition, Transport, Retail, Others (specify).
Suitable applications		Film production – high grade. Manufactured product – medium grade.

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		Cement and road base – low grade.
Colour	_____% mixed coloured; _____% black/white agricultural film	Clear share versus coloured: 98/2%, 90/10%, 80/20%, 70/30%, 60/40% and 50/50%, 40/50%, 30/70%, 10/90% & 2/98%. If you are able to specify the % coloured and the % black/white agricultural film please do so.
PE-LD content (min %)		If known, show % of flexible PE in these, if not known state unknown. The mix is more likely to be known for pre-consumer (industrial) waste.
PE-LLD content (min %)		
PE-HD content (min %)		
Impurities		
Total impurities content (max %)		8% by weight.
Metals (max %)		Metallic & mineral impurities with an item weight of >100g are not permitted. Other metal articles <0.1% by weight.
Paper/Cardboard (max %)		< 1% by weight.
PVC (max %)		< 1% by weight.
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Moisture sources (max %)		<5% (Residue food, liquids, soil, other).
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