Recycling Guide for Fillers Marketing in HDPE

Part 1 Containers for Home Use
Part 2 Wheelie Bins





This booklet is to be used as a guide only and has been funded through the National Packaging Covenant Transitional Arrangements Program. It's development has been facilitated by ACOR members.

April 2003

The information in this booklet is designed to:

- Assist package designers and fillers to identify and reduce HDPE packaging contaminates that inhibit the recycling process.
- Ensure HDPE packaging recovered by industry and sponsored collection programs, within Australia & New Zealand is able to be recycled.

Contents

Introduction

A major reason for the success of HDPE as a packaging material has been its recyclability. To ensure maximum HDPE recycling rates are achieved, it is important that those designing HDPE containers, labels and closures, give due consideration to factors that could impact on the existing HDPE recycling processes and infrastructure.

Kerbside Recycling Programs

The majority of HDPE food, beverage and household chemical packaging is recovered from domestic kerbside recycling programs and drop off facilities. HDPE containers are separated into two streams for reprocessing. Opaque or "*natural*" HDPE identified as milk bottles and juice bottles and coloured HDPE containers. Once separated, these containers are manufactured into a number recycled products marketed within Australia and New Zealand and some is exported for processing.

- Reprocessors have developed strong markets using the "*natural*" HDPE bottles. Many manufacturers limit their processes to manufacture specific products, due to the variation of polymers used in the manufacture of labels and caps. The cap and label polymers create levels of contamination that effectively restrict the opportunities to provide a consistent and standard-quality product that competes with virgin resin.
  This leaves the recycled product as always being identified as a secondary resin to virgin. Recycled resin also competes in the market place with off-spec or lower priced virgin resin.
- Coloured HDPE containers are being recycled in what could be identified as developing markets. Markets are generally limited due to the impact of colour on the final material but can be used in applications such as irrigation piping, compost bins and bar stools for steel work in concreting, etc.

This booklet is designed to:

- Provide fillers with a guide to the recyclabilty of new bottle labels, closures, inks, tamper proof seals or any other accessory used to market beverages, food and household chemical products in HDPE containers.
- Be a working document that will need updating from time to time.

We welcome the input of companies that can provide additional information to ensure that package designers and fillers are provided with the latest technology and information on available products.

The booklet identifies and lists accessories and other contaminates of the HDPE recycling process; provides reasons why a specific product contaminates the HDPE recycling process, and, where possible, suggests alternative products that can be recycled via the HDPE process.

COMMON ABBREVIATIONS

Term	Abbreviation
Polypropylene	PP
Poly (Ethylene-co-Vinyl Acetate)	EVA
Low Density Polyethylene	LDPE
High Density Polyethylene	HDPE
Styrenic resins	ABS ; PS; SAN
Orientated Polystyrene	OPS
Poly Vinyl Chloride	PVC
Polyethylene Terephthalate	PET
Specific Gravity	SG
Hazardous Aromatic Printing Solvents	HAPS
Hydrochloric Acid	HCl
Styrene Isoprene Styrene	SIS
Styrene Butadiene Rubber	SBR
Intrinsic Viscosity	IV
Ultra Violet	UV

Industry polymer identification coding system

PET symbol PET (Polyethylene Terephthalate) – used for beverage bottles, food vessels (egg, jam jars and sauce bottles), sheeting applications, (e.g., cake and sandwich trays), textile fabrics, garment fibres, industrial fibre applications, such as tamper proof seals, etc.

HDPE symbol HDPE (High Density Polyethylene) – bottle caps, crinkly shopping bags, freezer bags, household chemical bottles/containers - bleach and detergents, milk bottles, bottle closure, bottle labels, etc.

PVC symbol Plasticized (PPVC) or Unplasticised (UPVC) Polyvinyl Chloride – plumbing pipes, garden hoses, blister packs, and labels, tamper proof seals, seals, etc.

LDPE (Low Density Polyethylene) – garbage bags, garbage bins, recycling bins, bottle closure, bottle labels, etc.

PP (Polypropylene) – drinking straws, microwave ovenware, plastic hinged lunch boxes, bottle closures, household chemical containers, labels, etc.

PS (Polystyrene or Expanded Polystyrene) – yoghurt containers, plastic cutlery, foam hot drinks cups, etc.

All other resins and multi blend plastic materials.

Rules Of Polymer Recycling

Coding For Polymers

An international industry coding was established to assist manufacturers, recycling industry, government agencies and consumers to identify the types of polymers available in the domestic stream. The Plastics and Chemicals Industries Association (PACIA) govern this code in Australia.

The number 2 inserted in a triangle and clearly embossed on the base of the container identifies HDPE containers. This code assists consumers and the recycling industry to identify and separate HDPE containers.

Identification coding symbol used to identify HDPE (High Density Polyethylene).

If the container is manufactured using a blend of plastics, eg two or more plastics (HDPE and any other plastic), the container should be identified with the plastic industry code number 7 inserted in a triangle.

Identification coding symbol used to identify two more polymers blended into the same container.

Polymers Separation Process

The most common method used to separate plastics during the reprocessing process is by flotation during a wash process. Elutriation is another method used to remove labels or light weight accessories. It is not suitable for removing cap material. If labels, seals and closures are manufactured from products with a specific gravity (SG) greater than water (the specific gravity of water being 1.0), the polymer will sink thus enabling the opportunity to separate the polymers by flotation during the washing process. HDPE is lighter than water, with a specific gravity (SG) of 0.96.

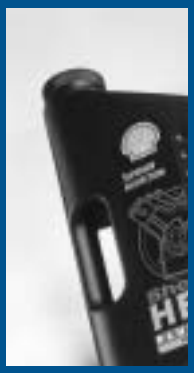
Simple Specific Gravity Test

Most plastics have specific gravities in the range of 0.9 to 1.5. To obtain an exact specific gravity requires a set of laboratory scales but an order of magnitude can be reached using a simple test procedure.

Add a couple of drops of detergent to a beaker of water. The detergent helps to overcome the effects of the surface tension. Drop in a small piece of the plastic you wish to test into the beaker. If it floats, its specific gravity is less than 1.0. If it sinks the specific gravity is greater than water.

COMPARISON OF THE POLYMER PROPERTIES

Abbreviation	Polymer Types	Specific Gravities	Softening Or Melt Range (°C)
PP	Polypropylene	0.91	160 – 170
EVA	Poly (Ethylene-co-Vinyl Acetate)	0.92	40 – 60
LDPE	Low-Density Polyethylene	0.92	110
HDPE	High-Density Polyethylene	0.96	130
H_2O	Water	1.00	
ABS	Acrylonitrile-butadiene-styrene	1.05	90 – 110
OPS	Orientated Polystyrene	1.06	80 – 95
PVC	Poly Vinyl Chloride	1.35-1.40	70 – 90
PET	Polyethylene Terephthalate	1.35-1.40	240 – 260



Part 1

Containers for Home Use

Recovery & Recycling Process

Preamble

The majority of HDPE recovered for reprocessing is through Local Government Kerbside Recovery Programs, operating throughout Australia and New Zealand where householders place the HDPE out for recycling along with other recyclables.

The HDPE is transported from the kerbside to a Materials Recovery Facility (MRF) for sorting into individual polymer streams. In the case of HDPE, the HDPE is separated into two streams:

- Opaque or "natural" – milk and juice bottles (HDPE)
- Coloured bottles – laundry, cleaning, juice and flavoured milk bottles (HDPE)

The HDPE is then baled and transported to reprocessing facilities where the recycling process commences.

Hdpe Recycling Process

De-baling process

The bales are de-baled back into individual bottles/ containers so that contaminates such as metal, glass, PVC, grit and other non friendly materials to the HDPE process can be removed.

Sorting Process

Opaque or "natural " bottles

Manual sorters normally look for and remove any PVC, glass, metal seals and caps and metallic labels that impact in the process.

A percentage of caps (majority HDPE & LLD) normally work free from the compaction process and are removed at this point. Caps will add colour to the end product, which impacts upon the quality of the final product.

Aluminium closures and seals can severely impact the viability of recycling HDPE. Consequently suppliers of packaging and fillers should be aware of the impact of changes to the composition of primary packaging and should consult with the recycling industry.

Coloured bottle

Manual sorters normally look for and remove any PVC, glass, metal seals & caps, metallic labels that impact in the process.

While caps may work free, if the caps are made of HDPE they can be incorporated in the final product.

Granulation

When sorted, the bottles are conveyed to a granulator where they are chopped into flake particles averaging from approx 4mm – 8 mm in size.

Washing Process

The wash process also provides the opportunity to act as float sink process, where the heavier particles are removed from the HDPE.

Clear or Opaque bottles

The HDPE flake is then transferred to wash tanks, where the flake goes through a washing process to remove metal, grit, PVC, PET and glass particles.

Wash water is normally ambient with a dilution of caustic (approx, 0.25 to 1.00 percent) to assist in removing water based glues and label.

Coloured bottle

The HDPE flake is then transferred to wash tanks, where the flake goes through a washing process to remove metal, grit, PVC, PET and glass particles.

The wash water is ambient with both a dilution of caustic and anti-foam to assist in removing detergents, label and water based glues.

Drying process

The HDPE flake is then dried prior to entering the extrusion process to remove any residue.

Flake sorting

Clear flake can be sorted from coloured flake using optical sorting equipment that ejects the coloured flakes leaving predominately clear flakes.

Extrusion Process

Flakes of plastic are fed into an extruder that melts, mixes and pumps the molten plastic through metal mesh filters that remove any residual contamination such as paper, grit, wood, aluminium etc.

After filtering, the melt is pumped into a pelletizing head or into a strand die head where the plastic is cooled and chopped into 2 – 3 mm beads/pellets.

Labels

Preamble

Innovation and design has seen significant change to labelling of packaging during the late 1990s - early 2000s. The change in label design has required continued recycling process design change; however at the same time new label design has provided an opportunity to recycle a greater range of packaging into a greater range of recycled products.

Labels can impact on the recycling process, if the label cannot be removed from the container either by flotation, washing or elutriation, or where the melt range of the polymers is not compatible during the extrusion process of HDPE.

New Innovation/s

Innovations like the Rip'n'Recycle™ label are intended to assist recycling as the label can be removed prior to the container being recovered at kerbside or where the perforated line provides opportunity to remove the label during the recycling process.

The success of Rip'nRecycle relies on consumer education and participation to remove the labels. Additional costs/resources maybe associated with the removal of the label, if the polymers are not compatible to the container.

360° wrap labels using minimum amounts of glue or where the glue remains on the label, not the package, has assisted the recycling process.

PET or OPS labels will sink in the floatation process thus providing the opportunity to remove the label from the HDPE during the floatation process.

PVC labels will contaminate HDPE, where PVC label remains with the HDPE flake stream. This causes contaminated product by charring during the extrusion process or causing black specks.

Elutriation

Often elutriation is successful in removing labels due to the fineness of the label. Elutriation is not as successful in removing cap material due to the weight of the cap flake closely matching that of the bottle flake.

Colour Separation

Colour sorting equipment is available to remove coloured particles after the flaking or resin stages of the recycling process; however colour-sorting equipment is expensive and not always affordable to the reprocessor.

Specific Density of HDPE

The density of HDPE is; 0.94-0.97,
melting range approx. 130 (°C)

Polypropylene Labels

Polypropylene; Density 0.90,
melting range 160-170 (°C)

Polypropylene labels float and will not be separated from the HDPE bottle stream. Such mixtures of polymers can be recycled for low-grade applications. High levels of PP will contaminant the recycled HDPE stream and cannot be separated with known commercial equipment or processes. It can lead to product failure in the remanufacturing process.

Polyethylene Terephthalate Labels

PET Density; 1.35 -1.38,
melting range approx. 240-260 (°C)

PET labels are removed during the flake washing process. PET sinks and can be removed by a counter-current flow of water in the washing process. Any PET remaining on the HDPE flake will remain a solid, due to its melt point and accordingly will remain on the screen pack during the extrusion process when the two polymers remain in the same stream (PET's melt range being significantly higher than HDPE).

Low Density Polyethylene Labels

LDPE Density; 0.92,
melting range approx. 110 (°C)

LDPE labels have similar density as the HDPE bottle flake and small amounts are acceptable to the HDPE recycling process, although if coloured, through decoration or printing, it will colour the HDPE.

Where floatation is not successful in removing LDPE labels during the recycling process elutriation or colour sortation equipment can be used to remove labels and coloured labels.

If small amounts of LDPE label remain on the HDPE flake prior to extrusion, it will normally colour the flake, thus reducing the opportunity to market the resin, as the melt index of LDPE is similar to HDPE.

Orientated Polystyrene Labels

OPS Density; 1.05,
melting range approx. 80-95 (°C)

OPS labels are heavier than water, therefore sink during the recycling process and can be separated from the HDPE flake during the washing process.

Any OPS remaining on the HDPE flake will degrade during the extrusion process when the two polymers are heated together (OPS melt range being significantly lower that HDPE).

PVC Labels

PVC Density; 1.35-1.38,
melting range approx. 70-90 (°C)

PVC is heavier than water and can be removed during the washing process. Contamination will occur if resident time during the washing / floatation process is not long enough or the wetting of the surface is not adequate. Due to high surface to weight ratio PVC liner may be carried with the HDPE stream and cause contaminated product.

Any PVC remaining on the HDPE flake will degrade during the extrusion process when the two polymers are heated together. PVC melt range being significantly lower that HDPE.

If the PVC is not removed during the floatation process the PVC will essentially degrade to carbon char giving off hydrochloric acid (HCl) in the process. The carbon char turns to black specks in the resin effectively contaminating the resin.

HDPE Labels

HDPE Density; 0.96,
melting range approx. 130 (°C)

Clear HDPE labels

Clear HDPE labels or labels with minimal ink retain the same characteristics as the HDPE bottle flake and small amounts of colouring being acceptable to a number of processes. Colour will always restrict the opportunity to produce clear resin.

Where floatation is not successful in removing coloured HDPE labels during the recycling process, elutriation or colour sortation equipment is used to remove labels and coloured plastics.

Coloured HDPE labels

Coloured HDPE labels are normally a result of impregnating the label with ink to deliver a marketing message. Currently, the recycling systems available in Australia & New Zealand cannot remove 100% of ink from the label. During the recycling process the ink can bleed creating flake colouring or the HDPE label will retain the colouring, thus contaminating the HDPE process.

Metallic Impregnated Labels

Contaminate the process

Metallic labels are difficult to handle during the recycling process; the label will fragment leaving fine particles of metallic flake in the HDPE process. These particles create black specks in the resin thus contaminating the HDPE resin.

Metallic labels effectively limit the markets that the reprocessed resin can use to reproduce new products.

Generally most re-processors will not process containers with metallic labels.

Wet Strength Paper Labels

Contaminate the process

Wet strength paper labels have ‘sizing’ agents to waterproof the paper fibres. Such labels do not disintegrate to pulp during the washing process. As a consequence, the paper can remain with the HDPE flake. The paper residue reduces the quality of the HDPE during the extrusion of the HDPE creating a substandard product.

The majority of re-processors will reprocess containers or packaging with this label.

Paper Labels

Paper labels create a number of issues for the recycling process. Depending on the volume of paper label, the paper label can turn to pulp when coming in contact with water in the process. The paper fibre then blocks filters.

The paper label can increase the cost of extrusion by up to 40% simply by increasing the cost of replacement screen packs during the extrusion process.

The ink used in the labels can create problems such as bleeding, which leads to discolouration of the HDPE flake during the reforming process.

Recyclablitity Of Adhesives

Information On Adhesives

The most acceptable adhesives in the HDPE recycling process are water-based glues, which are diluted and removed during the washing process. As the wash water temperature is ambient the rubber compound based glues cannot be removed during this process.

Standard Hot Melt Adhesives

Non-Compatible with the process

Standard hot melt adhesives based on SBR or SIS, and containing tackifiers and hydrocarbon extenders, is non-compatible to the process.

Pressure Sensitive Adhesives

Non-Compatible with the process

Pressure sensitive adhesives are difficult to remove during all polymer recycling programs.

Pressure sensitive adhesives, which cover the entire back of the label, are difficult to remove and contaminate the process. The label remains on and after completion of the flake during the washing process.

Recyclable Inks

Inks Used On Labels

Inks should be water-soluble. Such inks can be removed during the process; however, a considerable amount of ink can discolour the wash water to the extent where HDPE flake becomes coloured.

Closures And Seals

Natural HDPE Bottles

A large percentage of caps on clear or HDPE bottles are normally HDPE & LLD. These caps will add colour to the end product if a large percentage remains in the process.

Coloured HDPE Bottles

A large percentage of caps on coloured bottles are normally HDPE & PP. Because the bottle is coloured with a small percentage of caps being PP, the caps don't have a great impact on the end product.

PVC Tamper Proof Seals

PVC Density; 1.35-1.38,
melting range approx. 70-90 (℃)

Contaminate the process

Current designs of the PVC tamper proof seal result in parts of the seal remaining on the bottle when consumers remove the cap, thus contaminating the HDPE recycling process. Recycling companies manually remove these bottles from the process because of the PVC on the bottles. Generally the tamper proof seal tends to break away at the release point of the cap, leaving PVC flim on the shoulder or the neck of the bottle. Accordingly PVC seals cause the following process problems when being recycled:

Heating or extrusion process

During the extrusion process where the two polymers are heated together, PVC contamination in the HDPE stream will generate black specks in the resin, because PVC degrades at the processing temperatures used for HDPE. PVC essentially degrades to carbon char, giving off hydrochloric acid in the process. The HCl also breaks down the polymer chain length of HDPE.

Aluminium Closures & Seals

Contaminate the process

Aluminium closures contaminate the HDPE recycling process if the tamper proof seal on the aluminium closure does not break free as the consumer removes the closure to consume the product. Some closures are designed so the tamper proof seal remains on the bottle.

Aluminium Tamper Proof Seals

Contaminate the process

Aluminium seals are generally retained as an outer ring on the bottle or as a plug if the seal has not been completely removed. Aluminium is

a contaminant, which will impact the recyclability of HDPE through significant process losses (ie. material diverted to waste) increased cost of processing and reduced quality of reprocessed material.

Polypropylene Closures

Polypropylene; Density 0.90,
melting range 160-170 (°C)

PP is lighter than water and cannot be separated from HDPE bottle stream. A mixture of PP closure and HDPE bottle is recyclable and can be used in low-grade application.

High Density Polyethylene Closures

HDPE Density; 0.96,
melting range approx. 130 (°C)

HDPE is lighter than water and floats to the surface during the washing process. HDPE closures are different grade material than the HDPE bottle but should not represent a major problem for recycling

Low Density Polyethylene Closures

LDPE Density; 0.92,
melting range approx. 110 (°C)

Compatible with the process
(Lighter than water)

LDPE is lighter than water and floats to the surface during the washing process. LDPE closures cannot be removed from HDPE bottle stream with available commercial equipment and processes; however, a mixture of LDPE and HDPE can be recycled together due to the miscibility of the polymers.

Metal Inserts

Contaminate the process

A number of HDPE bottles with trigger heads, plungers or dispensers, contain metal springs and/or ball bearings eg household chemical containers. These metal items are totally incompatible with the HDPE recycling process and cause massive damage to grinding blades as well as causing metal contamination in the recycled HDPE.

Closures - Wad/Liner

PVC Closure Wad / Liner

PVC Density; 1.35-1.38,
melting range approx. 70-90 (℃)

PVC is heavier than water and can be removed during the washing process. Contamination will occur if resident time during the washing / floatation process is not long enough or the wetting of the surface is not adequate. Due to high surface to weight ratio PVC liner may be carried with the HDPE stream and cause contaminated product.

Eva Closure Wad/Liner

EVA liners cannot be removed during the washing process because it's lighter than water. Mixtures of EVA and HDPE bottles can be recycled and used in low-grade applications.

Household Chemicals Marketed And Stored In HDPE

All kerbside promotion material should highlight cleaning and rinsing of all household chemical and substance containers prior to them being deposited in the recycling bin.

Normally coloured HDPE containers are used to market and store the range of household chemicals available to the consumer throughout Australia and New Zealand.

Coloured HDPE containers are sorted at the recycling centres and processed into non food grade items, such as milk crates, garden stakes and pipes.

Both the cap and residue should be removed using recommended procedures prior to recycling.

Contacts For Future Reference

The information contained in this booklet is the result of trialling, testing and processing HDPE by recyclers throughout Australia and New Zealand. These companies have provided the data based on their experience when processing HDPE for manufacturing into new products.

Should you be developing new products and have questions about HDPE product recyclability that you regard as “commercially sensitive” in nature, you may wish to obtain confidential advice from industry. Please contact the following organisations that will refer you to the most appropriate member to assist you with your enquiry.

Australia

Australian Council of Recyclers (ACOR)

PO BOX 277
Balgowlah NSW 2093

Tel: 61 2 9907 0883
Fax: 61 2 9907 0330

Website www: acor.org.au
Email admin@acor.org.au

Packaging Council of Australia

Level 3/15 -17 Park St
South Melbourne 3205

Tel: 61 3 9690 1955
Fax: 61 3 9690 3514

Website: www.packcoun.org.au
Email: packcoun@packcoun.com.au

Plastics and Chemicals Industry Assoc (PACIA)

2/263 Mary st
Richmond VIC 3121

Tel: 61 3 9426 3810
Fax: 61 3 9429 0690

Website: www.pacia.org.au
Email: pbury@pacia.org.au

Beverage Industry Environment Council (BIEC)

9 Glebe St
Glebe NSW 2037

Tel: 61 1300 785 502

Website: www.biec.com.au
Email: liason@biec.com.au

New Zealand

The Recycling Operators of New Zealand (RONZ)

PO Box 33 183
Takapuna Auckland New Zealand

Tel: 649 488 9449
Fax: 649 488 9410

Email: info@ronz.org.nz
Website: www.ronz.org.nz

Plastics New Zealand

Level 4 Leyton House
Manukau City Shopping Centre
Auckland New Zealand

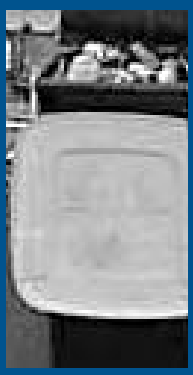
Tel: 64 9 262 3773
Fax: 64 9 262 3850

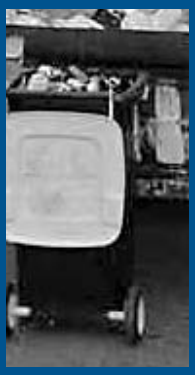
Packaging Council of New Zealand

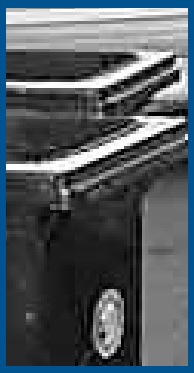
PO Box 76
Manukau City
Auckland New Zealand

Tel: 64 9 262 4044
Fax: 64 9 262 4111

Email: j.webber@packaging.org.nz







Part 2

Mobile Garbage Bins

Collection

The return of mobile garbage bins to the recycling process occurs in two ways:

- There is a general and steady flow of retired or damaged bins from the householder back to the Council depots or to the waste contractor for the council area. Recycling companies for shipping and processing at their sites then purchase these retired bins.
- When a new contract is awarded by a Council for a new or different waste service there may be situations where a pullback of all the bins used by the old service are taken out and replaced with new bins. This pullback of bins returns large quantities of bins that are either purchased by the recycler for shipping and reprocessing at their sites.

Sorting Process

1. Primary Sort by predominant colours

The main colours of mobile bins have not changed greatly since their introduction in the early 1980's. This enables the recycler to sort by colours so that materials from the majority of retired bins can be segregated and recycled directly back into the mobile bin manufacturing process.

The smaller quantities of other colours are amalgamated and used to produce grades suitable for very dark colours or black.

2. Secondary Sort by lid material

For a period of time some lids used on mobile garbage bins were manufactured from polypropylene as well as polyethylene. This necessitates the separation of these lids to avoid contamination of the HDPE stream. This separation also provides a secondary source of valuable polypropylene material for recycling.

3. Final sort at granulation

This requires individual inspection of each bin for removal of any non HDPE contaminants or components that may have been attached to the bin during it lifetime. This includes metal axles, wheels and various other items such as screws, bolts and pop rivets that may be attached to maintain the bin.

Granulation

Once sorting is complete each bin is conveyed to granulator and it is then chopped into small sections varying in size from 6mm to 12mm dependant on the end users requirements.

Washing Process

Granulated materials are put through a washing process. Initial stage of the wash is to remove much of the heavier attached contaminants through a vigorous agitation process. The granulate is then washed further in a float tank process that allows the contaminants that are heavier than HDPE to sink.

Water used in this process is at ambient temperature usually without any additives. A solution of diluted caustic soda can be used if there are large amounts of labels attached to the product.

Drying

Materials from the wash plant are then dried prior to the next stage of recycling. Wet or damp material can be extruded through vented barrel extruders.

Extrusion

The granulate is then processed through an extruder that, via a heating and pressurising method, melts and blends the material into a homogeneous mass that is pumped through

filtering systems. This filtering system removes any contaminants that have an SG lower than that of water, such as paper, wood and fine silt, and therefore travel through the washing process with the HDPE.

Pelletisation

The end of the extrusion process is the pelletising of material where the melt is forced through either a die face cutter system that cuts the melt strand into pellets and cools them immediately or through a strand die head that allows the strand to cool sufficiently before cutting. Pellet size is generally between 2mm to 4mm.

Contaminants

1. Labels

As with label contamination for bottles, the type of material that is used for the label as well as the glue used is an issue to some degree, although due to the size of the individual product the ratio of contaminant is relatively low in comparison to bottles and small containers.

2. Polypropylene

The fact that some lids have been produced from polypropylene creates an issue. The sorting process to eliminate is a manual one and requires some skill to be able to identify the different materials given the fact that they are close relatives in the polymer chain and their characteristics are similar. Only very small percentages of this contamination is acceptable, in particular for recycling back into uses such as mobile garbage bins, where stringent mechanical tests have to be passed.

Please direct inquiries on Mobile Garbage Bin recycling to:

SULO MGB

PO Box 1957
Gosford NSW 2250

Tel: 61 2 4348 8188
Fax: 61 2 4348 8123

www.acor.org.au

For further information:

Australian Council of Recyclers Inc.

P O Box 277
BALGOWLAH NSW 2093
Australia

Tel: 61 2 9907 0883
Fax: 61 2 9907 0330

Email: admin@acor.org.au
Website: www.acor.org.au