



**Ravapura<sup>®</sup>**

**PCR Compounds**

# Ravago Manufacturing

## Your partner in recycling & compounding

Ravago Manufacturing is a global producer of high-quality plastic compounds, including polyolefins, thermoplastic elastomers, rubbers, and engineering plastics. We offer virgin and recycled products in many polymer types and provide solutions for a wide range of markets, including mobility, consumer goods, building and construction, packaging, and electronics.

Over the last 60 years, we have developed extensive knowledge and expertise in recycling and compounding techniques and continue expanding our portfolio and capabilities. We use post-industrial recycled (PIR) and post-consumer recycled (PCR) raw materials at scale to produce compounds that support customers in lowering the environmental footprint of their products.

With a range of manufacturing and laboratory facilities, Ravago Manufacturing works together with customers to find solutions to their most challenging application requirements. This includes developing tailor-made formulations to meet specific color and performance requirements and offering product design recommendations and advice on designing for recycling.



## Ravapura® PCR-based Compounds

Ravapura is the latest brand from Ravago, encompassing a range of guaranteed post-use recycled compounds. Ravapura compounds combine carefully selected certified post-use or post-consumer recycled (PCR) materials with consistent, high quality in one single pellet. Customers can meet their sustainability targets whilst also benefiting from excellent processability, appearance, mechanical performance and finished product final specifications.



In 1961, when Raf Van Gorp founded the company, he pioneered the recycling of plastics through the development of treatment and formulation capabilities. From there, the company expanded to a global provider of plastic compounds, tailored to meet customer needs. It is this core skill of carefully selecting and combining the right recycled and virgin grades, that allows us to consistently deliver large volumes of high performance Ravapura products.



## Ravapura® LDPE

Ravapura LDPE combines excellent processing and consistent mechanical properties. It is most suitable for use in primary and secondary packaging applications.

### Features & benefits:

- Available in natural color
- Produces fully transparent films with low gel level and minimal odor
- Used in monolayer and multilayer films, both in skin and core layers
- Enables production of blown films as thin as 15 µm
- Options for tailor made compounds based on your specific needs
- Available with and without slip/antiblock package
- Allows you to meet plastic packaging tax requirements



| Product Portfolio               | Ravapura L70                                         | Ravapura L7010         | Ravapura L7020         |
|---------------------------------|------------------------------------------------------|------------------------|------------------------|
| PCR content                     | 70%                                                  | 70%                    | 70%                    |
| Virgin polymer                  | LDPE                                                 | LDPE                   | LDPE                   |
| MFI (190°C / 2.16kg)            | 0.7 g/10 min                                         | 1.0 g/10 min           | 2.0 g/10 min           |
| Density                         | 0.92 g/cm <sup>3</sup>                               | 0.92 g/cm <sup>3</sup> | 0.92 g/cm <sup>3</sup> |
| Dart impact strength            | 90 g                                                 | 90 g                   | -                      |
| Elmendorf tear MD/TD            | 100/450 g                                            | 100/450 g              | -                      |
| Tensile strength at break MD/TD | 18/20 MPa                                            | 18/20 MPa              | -                      |
| Elongation at break MD/TD       | 300/550 %                                            | 300/550 %              | -                      |
| Typical applications            | Shrink film, packaging & protective films (non-food) |                        |                        |



## Case study: Ravapura C70 in secondary hygiene packaging

A customer was looking to increase post-consumer recycled content in their packaging whilst also making it suitable for recycling with a mono-material design.

Ravapura C70 provided the ideal solution for this application by offering:

- 70% LDPE PCR content
- Excellent sealability
- Reliable, virgin-like processability
- Low gel content
- Excellent surface printability
- Consistent batch-to-batch quality



| Ravapura LDPE 7007     | Ravapura LDPE 4560               | Ravapura C70                                                           | Ravapura C7010         |
|------------------------|----------------------------------|------------------------------------------------------------------------|------------------------|
| 70%                    | 45%                              | 70%                                                                    | 70%                    |
| LDPE                   | LDPE                             | LLDPE                                                                  | LLDPE                  |
| 0.7 g/10 min           | 6.0 g/10 min                     | 0.7 g/10 min                                                           | 1.0 g/10 min           |
| 0.92 g/cm <sup>3</sup> | 0.92 g/cm <sup>3</sup>           | 0.92 g/cm <sup>3</sup>                                                 | 0.92 g/cm <sup>3</sup> |
| 90 g                   | -                                | 140 g                                                                  | 140 g                  |
| 100/450 g              | -                                | 250/725 g                                                              | 250/725 g              |
| 18/20 MPa              | -                                | 22/24 MPa                                                              | 22/24 MPa              |
| 300/550 %              | -                                | 500/600 %                                                              | 500/600 %              |
| Foam extrusion         | Closures, fasteners & blown film | Multilayer film, stretch film, packaging & protective films (non-food) |                        |

# Ravapura® HDPE

Ravapura HDPE combines good processing with batch-to-batch mechanical property consistency. Our blow molding grades find use in a wide range of applications including non-food packaging, consumer goods and household goods. Applications for our injection molding grade include secondary packaging, industrial packaging and storage containers..

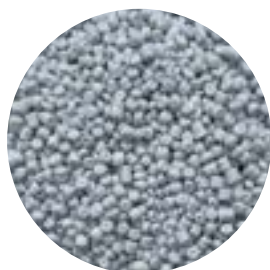
## Features & benefits:

- Available in natural, white and a selection of grey colors
- Process like virgin HDPE
- Excellent colorability
- Stress cracking optimization
- Produces items with consistent color, low gel level and minimal odor
- Options for tailor made compounds based on your specific needs

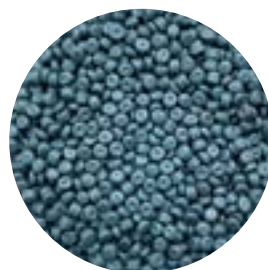
| Product Portfolio     | Ravapura HDPE 7525           | Ravapura HDPE 5004           | Ravapura HDPE 9504   |
|-----------------------|------------------------------|------------------------------|----------------------|
| Processing method     | Blow molding                 | Injection molding            | Injection molding    |
| PCR content           | 75%                          | 50%                          | 95%                  |
| MFI (190°C / 2.16 kg) | 0.25 g/10 min                | 4.0 g/10 min                 | 4.0 g/10 min         |
| Color                 | Natural, white & medium grey | Light & dark grey (RAL 7015) | Dark grey (RAL 7015) |



Ravapura HDPE 7525  
Natural



Ravapura HDPE 7525  
White



Ravapura HDPE 7525  
Medium grey



Ravapura HDPE 5004  
Light grey



## Case study: Ravapura HDPE 7525 in blow molded containers

A customer wanted a PCR-based drop-in replacement for virgin HDPE to produce 5L containers for liquid cleaning products. The containers needed to have translucency, enabling the liquid to be seen through it, and also to look good on the shelf in stores.

Ravapura HDPE 7525 was used successfully in this application to deliver:

- 75% HDPE PCR content (also suitable for blending with virgin HDPE)
- Easy drop-in processability
- Outstanding optics
- Low gel level
- Minimal odor



### Colorability

Following testing with Avient's color prediction tool, Ravapura HDPE 7525 natural was shown to be able to achieve **90%** of the same colors as a virgin HDPE natural material with 2% color masterbatch. This provides a great solution for brand owners who want to increase the post-consumer recycled content of their packaging whilst still meeting their stringent brand color requirements. Contact us to find out more.



# Ravapura® PP

Ravapura PP combines good processing with batch-to-batch mechanical property consistency. It can be used in applications such as non-food packaging, household goods and electrical & electronic equipment.

## Features & benefits:

- Mineral and glass fiber filled options available
- UV stabilization possible
- Improved flow, impact and stiffness options
- Colorable and pre-colored grades available
- Options for tailor made compounds based on your specific needs

| Product Portfolio           | Ravapura PP 5020                     | Ravapura PP 5040    | Ravapura PP 8030     | Ravapura PP 99XX series |
|-----------------------------|--------------------------------------|---------------------|----------------------|-------------------------|
| PCR content                 | 50%                                  | 50%                 | 80%                  | 99%                     |
| MFI (230°C / 2.16kg)        | 20 g/10 min                          | 40 g/10 min         | 30 g/10 min          | 15 – 90 g/10 min        |
| Flexural modulus (23 °C)    | 1100 MPa                             | 1100 MPa            | 1100 MPa             | 1250 – 1150 Mpa         |
| Izod notched impact (23 °C) | 8 kJ/m <sup>2</sup>                  | 8 kJ/m <sup>2</sup> | 7 kJ/m <sup>2</sup>  | 6 – 4 kJ/m <sup>2</sup> |
| Color                       | Medium grey* & light grey (RAL 7035) | Medium grey*        | Dark grey (RAL 7011) | Light grey*             |

\*Coloring available upon request with minimum order quantity, also suitable for self-coloring

## Pre-colored grades

We offer ready-to-use grades in light and dark grey. The color specifications are available upon request.



Ravapura PP 5020  
Light grey  
RAL 7035



Ravapura PP 8030  
Dark grey  
RAL 7011



## Case study: Ravapura PP 4512 T20 HI UV in a hose reel housing application

A customer was looking to replace virgin talc-filled PP with post-consumer recycled content in the injection molded housings of hose reels. As the hose reels are often wall-mounted outside, and the hose reels are heavy, the material needed to meet challenging performance and aesthetic requirements.

Ravapura PP 4512 T20 HI UV was developed to meet these needs and bring:

- 45% PP PCR content
- 20% talc filled for high stiffness
- Impact modification to withstand mechanical testing
- UV stabilization to prevent outdoor ageing
- Excellent processability
- Color matching to meet brand owner requirements



### Colorable grades

No color is added to Ravapura PP 5020 or 5040 medium grey grades, or the 99XX series in light grey. We can develop colored grades for you upon request using our state-of-the-art color kitchen. Alternatively, you can self-color using your own masterbatch.



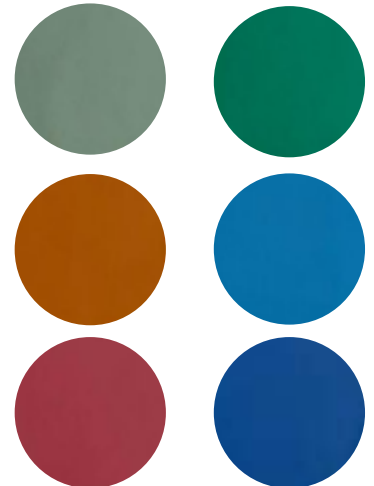
Ravapura PP  
5020 or 5040  
Medium grey



Examples of achievable colors with 2% MB



Ravapura PP  
99XX series  
Light grey



Examples of achievable colors with 3% MB

# Ravapura® ABS

Ravapura ABS combines excellent processing and consistent mechanical properties. It is most suitable for use in aesthetic applications such as small and large appliances, electrical boxes, automotive interior parts and furniture.

## Features & benefits:

- Available in black and a selection of grey colors, as well as pre-colored custom colors upon request
- High quality surface finish
- Further impact/stiffness optimization possibilities subject to application requirements

| Product Portfolio           | Ravapura ABS 3025                  | Ravapura ABS 5025       | Ravapura ABS 7022    |
|-----------------------------|------------------------------------|-------------------------|----------------------|
| PCR content                 | 30%                                | 50%                     | 70%                  |
| MFI (220°C / 10kg)          | 25 g/10 min                        | 25 g/10 min             | 22 g/10 min          |
| Izod notched impact (23 °C) | 16 kJ/m <sup>2</sup>               | 16 kJ/m <sup>2</sup>    | 14 kJ/m <sup>2</sup> |
| Gloss                       | High                               | High                    | Medium               |
| Color                       | RAL 9003-9010-9016<br>Pantone 194C | RAL 9005-7016-7040-7035 | RAL 9005-7016-7040   |
| UL listed                   | -                                  | ✓                       | -                    |



RAL 9003



RAL 9010



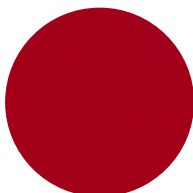
RAL 7040



RAL 7016



RAL 9016



Pantone 194C



RAL 7035



RAL 9005



## Case study: Ravapura ABS 5025 in smart-switch cover application

A company producing switches wanted to increase post-consumer recycled content whilst maintaining a great surface finish and still being able to offer a variety of color options in the market.

Ravapura ABS 5025 provided a solution by offering:

- 50% ABS PCR content
- Drop-in processing
- Good thermal properties
- Good impact resistance
- Enhanced surface aesthetics



## Ravapura® ABS for Automotive

The Ravapura ABS portfolio now also includes grades that have been specially designed for injection molded automotive interior applications. These grades enable incorporation of PCR content in automotive parts whilst ensuring excellent performance. They are available in dark grey and black that meet automotive OEM color requirements.

| Product Portfolio           | Ravapura ABS 3007HH  | Ravapura ABS 3015MT  |
|-----------------------------|----------------------|----------------------|
| PCR content                 | 30%                  | 30%                  |
| MFI (220°C / 10kg)          | 7 g/10 min           | 15 g/10 min          |
| Heat resistance             | High                 | Medium               |
| Izod notched impact (23 °C) | 14 kJ/m <sup>2</sup> | 14 kJ/m <sup>2</sup> |
| Gloss                       | Medium               | Low                  |
| Color                       | Dark grey, black     | Dark grey, black     |



# Ravapura® HIPS

Ravapura HIPS compounds combine excellent processing and consistent mechanical properties. Typical applications include non-food packaging, household goods and electrical equipment applications.

## Features & benefits:

- Available in white and grey, as well as custom colors upon request
- Excellent colorability
- Further impact/stiffness optimization possibilities subject to application requirements

| Product Portfolio                  | Ravapura PS 5012    | Ravapura PS 7010    | Ravapura PS 5008    |
|------------------------------------|---------------------|---------------------|---------------------|
| PCR content                        | 50%                 | 70%                 | 50%                 |
| MFI (200°C / 5kg)                  | 12 g/10 min         | 10 g/10 min         | 8 g/10 min          |
| Tensile modulus (23 °C)            | 2000 MPa            | 1950 MPa            | 1900 MPa            |
| Izod notched impact (23 °C)        | 8 kJ/m <sup>2</sup> | 7 kJ/m <sup>2</sup> | 9 kJ/m <sup>2</sup> |
| Glow wire flammability index (2mm) | -                   | -                   | -                   |



Ravapura PS 5012  
White



Ravapura PS 5012  
White



Ravapura PS 5012  
Grey



## Case study: Ravapura PS 4007 GW in electrical power distribution box

A company producing switches wanted to increase post-consumer recycled content whilst maintaining a great surface finish and still being able to offer a variety of color options in the market.

Ravapura PS 4007 GW offered the customer:

- 40% HIPS PCR content
- Improved flame retardancy & electrical properties
- Good impact resistance
- Enhanced surface aesthetics
- Compliance with IEC 60335-1:2020 for safety of electrical household appliances

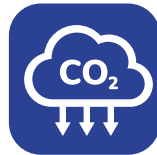


| Ravapura PS 4007 GW |
|---------------------|
| 40%                 |
| 7 g/10 min          |
| 2850 MPa            |
| 6 kJ/m <sup>2</sup> |
| 850                 |

## Why choose Ravapura® compounds?



Choose grades with a range of post-consumer recycled content from 30% up to 100%



Reduce your product carbon footprint compared to using virgin compounds



Compounds are upcycled to meet required properties, such as with heat & UV resistance, or reinforcement options



Experience excellent processability and consistent mechanical properties



Ravapura products have several certifications and adhere to industry standards that ensure regulatory and quality compliance



We offer technical and application support to ensure you reach your performance requirements



Many grades can be self-colored or colored by us upon request



Ravapura compounds are produced locally in Europe

We are committed to developing Ravapura grades that exactly meet your needs, so please contact us to find out more about our latest developments and to see how we can work together.



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