ReFresher

Optimised recycled pellet odour
in premium quality
ReFresher
High-efficiency anti-odour technology.

For more value added and completely new sales markets

Odour-optimised premium recycled pellets directly from contaminated post-consumer material? The efficient interplay of the innovative ReFresher technology with the proven INTAREMA® TVEplus® machine makes it possible. The unbeatable combination of top pellet quality and odour optimisation opens up completely new application opportunities for recycled plastics. In other words: innovative premium products in living space, automotive, design and lifestyle sectors.
100 % food contact compliant post consumer HDPE containers

- Milk and juice bottles

Food contact compliant PCR-HDPE pellets

- Suitable for different food packaging, e.g. milk and juice bottles, meat trays, etc.
- With up to 100 % PCR-HDPE content in the end product

In a joint project, Werner & Mertz, EREMA and The Group with the Green Dot developed the first 100 % PCR-HDPE shower gel bottle approved for use in cosmetics.

Photo credit: The Group with the Green Dot, Werner & Mertz
Odours in household waste:
- Intensive odours: high and low volatile odour substances
- Degree of contamination and moisture vary
- Strong contamination

Risk of odour through wood, paper and rubber
- Small pieces of wood, paper – left behind from labels
- Potential sources of odour, because in conventional
  plasticization and in turn transfer the odour to the plastic. The
  gentle treatment at the extruder are particularly effective and remove any gas
  inclusions which are still present from the melt. One secret of
  successful degassing and final degassing – what is
  required for the end product.

Solution: INTAREMA® TVEplus® mit ReFresher

High volatility odours out

- High volatility, low molecular substances, care of the high volatility, low molecular substances, care of the high volatility, low molecular substances, care of the high volatility, low molecular substances.

Low volatility odours out

- Odour reduction already at the beginning of the process:
  high volatility odours in INTAREMA® TVEplus® extruder system.
- The large-volume preconditioning unit ensures a long material
  residence time, required). Thanks to the ideal, process-stable
  temperature at which volatile materials can be
  discharged quickly and in depth. Particularly
  energy-saving: The ReFresher uses the system’s own
  energy from the pellets which are preheated
  impulsively and discharged directly.

Cleaned and filtered: QUALITY PELLETS

Perfectly filtered, homogenised and
degassed – ideal for a multitude of
applications, including
- Automotive
- Electrical and electronics
- Thermoforming
- Medical
- Technical

Preventing new odours

- Odour prevention: as offered only by the TVEplus ®
  intelligent odour prevention, as offered only by the TVEplus ®
  extruder system.
- The technology keeps the pellets at the required
  temperature for the end product.
- No complex vacuum system required
- Continuous odour discharge with hot
  flush gas
- Odour elimination and odour discharge in one
  application
- No complex vacuum system required
- Preheated pellets (CTP) are fed into the ReFresher
  system.
- A powerful vacuum – at least 60 °C
  temperature at which volatile materials can be
  discharged quickly and in depth. Particularly
  energy-saving: The ReFresher uses the system’s own
  energy from the pellets which are preheated
  impulsively and discharged directly.

Quality on:
- Only exactly specified pellets
- Continuous quality monitoring system
- An additional bonus when using the
  technology for the end product:
  - Perfectly filtered, homogenised and
    degassed – ideal for a multitude of
    applications including
    - Automotive
    - Electrical and electronics
    - Thermoforming
    - Medical
    - Technical

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**Refreshing benefits**

**Higher value added and new sales markets**
- The direct way from post consumer material to odour-optimised premium pellets
  - Opens up completely new application opportunities for recyclates in products, e.g. living space, automotive, design and lifestyle sectors
  - Ideal for particularly high-quality end products

**Premium quality through unique technology combination INTAREMA® TVEplus® & ReFresher**
- **INTAREMA® TVEplus®**: the quality of the pellets is extraordinarily high and stable directly after extrusion – including partial odour reduction
- **ReFresher**: targeted, intense odour reduction raises pellet quality to a premium level

**High economic efficiency and productivity**
- High, constant throughput and stable quality ensure low pellet costs per tonne
- No vacuum necessary in the ReFresher, i.e. lower operating and maintenance costs
- Odour treatment without the use of additional, expensive additives

**High energy efficiency saves costs**
- **INTAREMA® TVEplus®** with energy-saving ecoSAVE® technology
- ReFresher technology uses its own energy from the pellets which are preheated through the extrusion process
- Closed energy loops – ReFresher can use heat from other production processes
- Energy-saving, fully insulated ReFresher equipment

**Mobile ReFresher for trials**
Use the compact ReFresher for onsite trials at your production facility – this makes sure the investment is customised exactly in line with the specific odour requirements of your end application

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**Odour optimisation**

From post consumer material to premium pellets.

**Example:** HDPE regrind from shampoo bottles.

**Gas chromatographic analysis**
- odour-producing volatile substances (such as limonene, ethyl acetate, hexyl salicylate, isopropyl myristate, etc.). The sequence of the gas chromatographic pictures shows that with every step the total amount of odour-producing substances decreases considerably.

**Input material before odour treatment**
**After the INTAREMA® TVEplus®**
**After the ReFresher, 7 hours residence time**

**Concentration of indicator substance limonene (136g/mol)** as a function of residence time in INTAREMA® TVEplus®/ReFresher.

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**Technical data ReFresher**

<table>
<thead>
<tr>
<th>ReFresher MODEL</th>
<th>Capacity (kg/h)</th>
<th>Process window (h)</th>
<th>Process Unit (m³)</th>
<th>Dimensions* l x b x h (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReFresher 600 / 7</td>
<td>350 - 600</td>
<td>7 - 12</td>
<td>8.8</td>
<td>7.5 x 4.4 x 7.3</td>
</tr>
<tr>
<td>ReFresher 1100 / 7</td>
<td>650 - 1100</td>
<td>7 - 12</td>
<td>14</td>
<td>8 x 4.7 x 8.2</td>
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<tr>
<td>ReFresher 1900 / 7</td>
<td>1100 - 1900</td>
<td>7 - 12</td>
<td>26</td>
<td>8.5 x 5.1 x 9.5</td>
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<tr>
<td>ReFresher 2800 / 7</td>
<td>1600 - 2800</td>
<td>7 - 12</td>
<td>35</td>
<td>9.6 x 5.4 x 10.3</td>
</tr>
<tr>
<td>ReFresher 4000 / 7</td>
<td>2300 - 4000</td>
<td>7 - 12</td>
<td>51</td>
<td>10.5 x 5.7 x 11.3</td>
</tr>
</tbody>
</table>

*Dimensions incl. transfer container
More questions? We would be pleased to answer them!
Your EREMA advisor will be pleased to attend to your request personally and quickly.
If you are interested in a demonstration or a test run with your specific material it would be a pleasure for us to make an appointment and welcome you to our EREMA Customer Centre at the headquarters in Ansfelden, near Linz in Austria.

We look forward to seeing you at EREMA!

For worldwide representatives please visit www.erema.at

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