EREMA Plastic Recycling System with high performance degassing TVE

www.erema.at
In various cases (when processing particularly strongly printed, heavily contaminated and/or wet plastic waste) we experienced that conventional degassing extruders do not meet today’s requirements in daily recycling practice. This prompted Erema to develop a unique, patented technology: the TVE-extruder design of Erema with melt filter upstream of the extruder venting.

The simple yet superior design of this plant combines optimum degassing with finest possible filtration. This rules out the well-known disadvantages of conventional degassing extruders, e.g. limited ability to overcome pressure, sensitivity to clogged screens, insufficient degassing, which may even be too low for further processing (particularly in the case of heavily printed or heavily contaminated feeding material).

The technical features

- Optimum degassing efficiency:
  - Contaminants that tend also to form gas downstream of the degassing zone in the case of conventional degassing extruders, are filtered upstream of the degassing zone already.
  - Any gas inclusions in the melt that are caused by filtered, decomposing contaminants upstream of the filter screens, are removed in the subsequent degassing zone of the extruder.
  - Only completely molten polymer material can pass through the degassing zone of the extruder. Any unmelted polymer components remain in the section upstream of the melt filter until they are completely molten.
- Peak pressure rates, which are caused by filters becoming clogged by sudden high concentrations of contaminants, do not adversely affect the degassing efficiency (no risk of melt leakage at the degassing outlets as with conventional degassing extruders).
- No undesired air pockets in the melt upon screen change, which may be conveyed to the die head.
- Reduced wear as the contaminants, if any, are already separated in the middle of the extruder.
- Well proven system, more than 400 delivered worldwide (2004).
The economic benefits

- High-quality, perfectly degassed end product
- Largely maintenance-free – low service costs
- Compact, space-saving design
- Optional touch screen control, which widely increases plant productivity

Process description

Automatic feeding of the cutter compactor e.g. via feeding conveyor belt 1. In the cutter compactor 2 (optional in DD* configuration, see separate folder) the plastic material fed in is cut, mixed, heated, dried and densified. Furthermore, the rotary cutters ensure proper, continuous feeding of the downstream single-screw extruder. In the extruder 3 the material is plasticiﬁed. Then the melt is evacuated from the extruder and passed on to the melt ﬁlter 4. In the automatic, self-cleaning melt ﬁlter the melt is cleaned and returned to the extruder to be then passed on to the downstream degassing zone 5 of the extruder. Downstream of the degassing zone the melt is directly conveyed 6 to the respective tool (e.g., die face granulator) via a short discharge zone (no additional melt ﬁlter required).

*DD stands for "Double Disc" technology and refers to the separation of the working steps "material processing" (shredding, drying, preheating, compacting) from the step "extruder feeding" in the cutter compactor. The result is an extremely uniformly fed and evenly operating recycling extruder which constantly performs at its best, regardless of external factors (e.g. feed portion size, moisture etc.).

Between the plasticiﬁcation and the degassing zone of the extruder the screw is sealed off by means of a patented dynamic back ﬂow thread 7, which is continuously ﬂushed (counterflow) with a small quantity of cleaned melt. This ensures that the processed polymer does not deposit in the area of the seal. Via optional pressure difference measurement the function of the seating can be continuously supervised.

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### Plant Sizes

<table>
<thead>
<tr>
<th>Type</th>
<th>Average output capacity (kg/h) with typical polymers (depending on material properties)</th>
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<tbody>
<tr>
<td></td>
<td>LDPE, LLDPE</td>
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<tr>
<td></td>
<td>min</td>
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<tr>
<td>EREMA 1000 TVE</td>
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</tr>
<tr>
<td>EREMA 1702 TVE</td>
<td>2200</td>
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</tbody>
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### Why Erema?
- High-tech from the world market leader
- Top-notch state-of-the-art recycling technology
- Superior end product quality (pellet)
- Best customer service and care and therefore reliability for the user
- Tailor-made, individual solutions possible through large engineering capacity with more than 30 years experience in plastic recycling
- Superb reliability, flexibility and productivity
- Your best partner