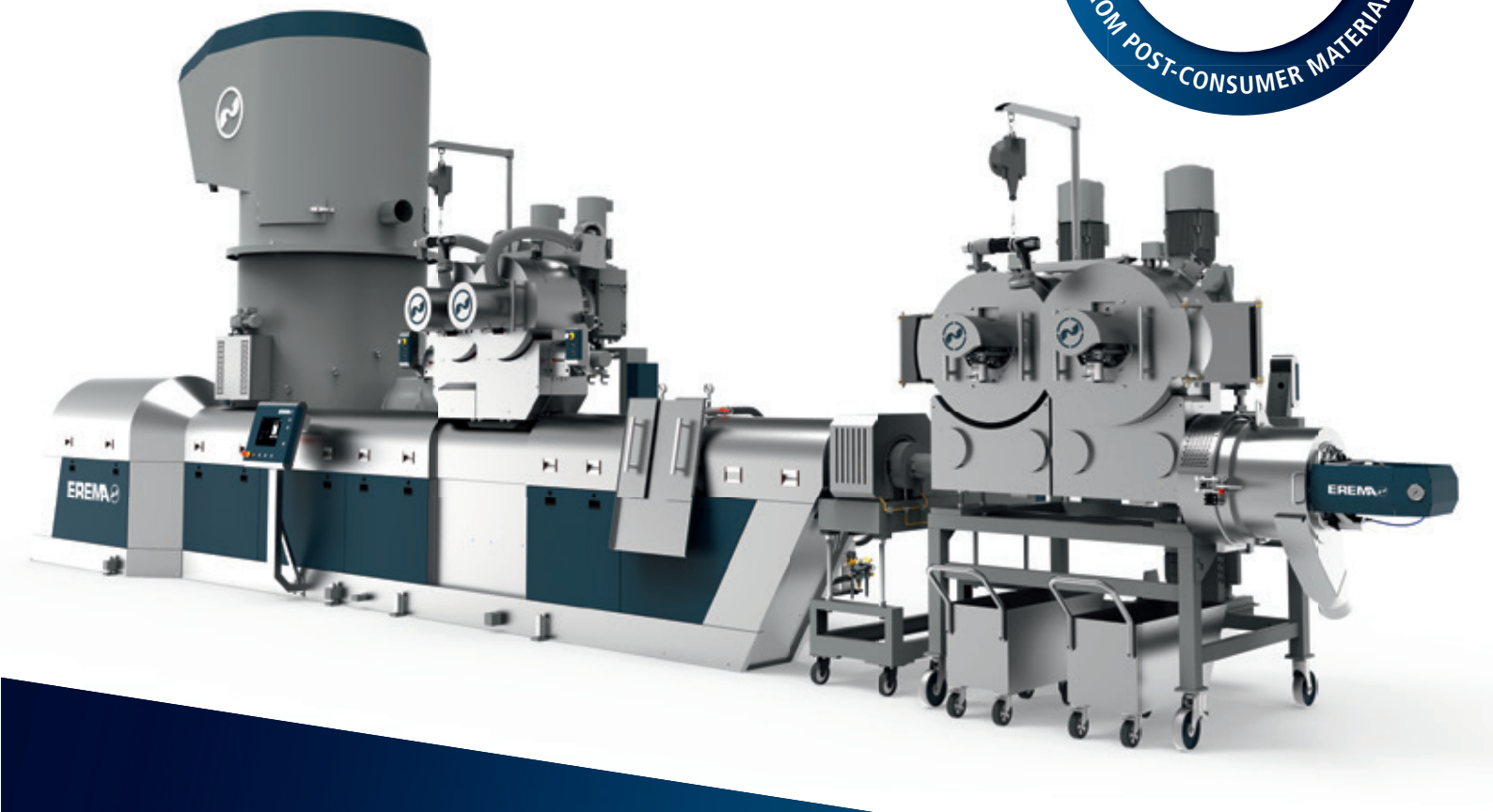
English

PERFECT QUALITY PELLETS
INTAREMA® TVEplus® DuaFil® Compact
FROM POST-CONSUMER MATERIALS



INTAREMA® TVEplus®

DuaFil® Compact

The best double filtration quality in a compact design.
Saves melt temperature, saves energy.

CHOOSE THE NUMBER ONE.

EREMA®
PLASTIC RECYCLING SYSTEMS

INTAREMA® TVEplus®

DuaFil® Compact

Lower temperature, less energy.

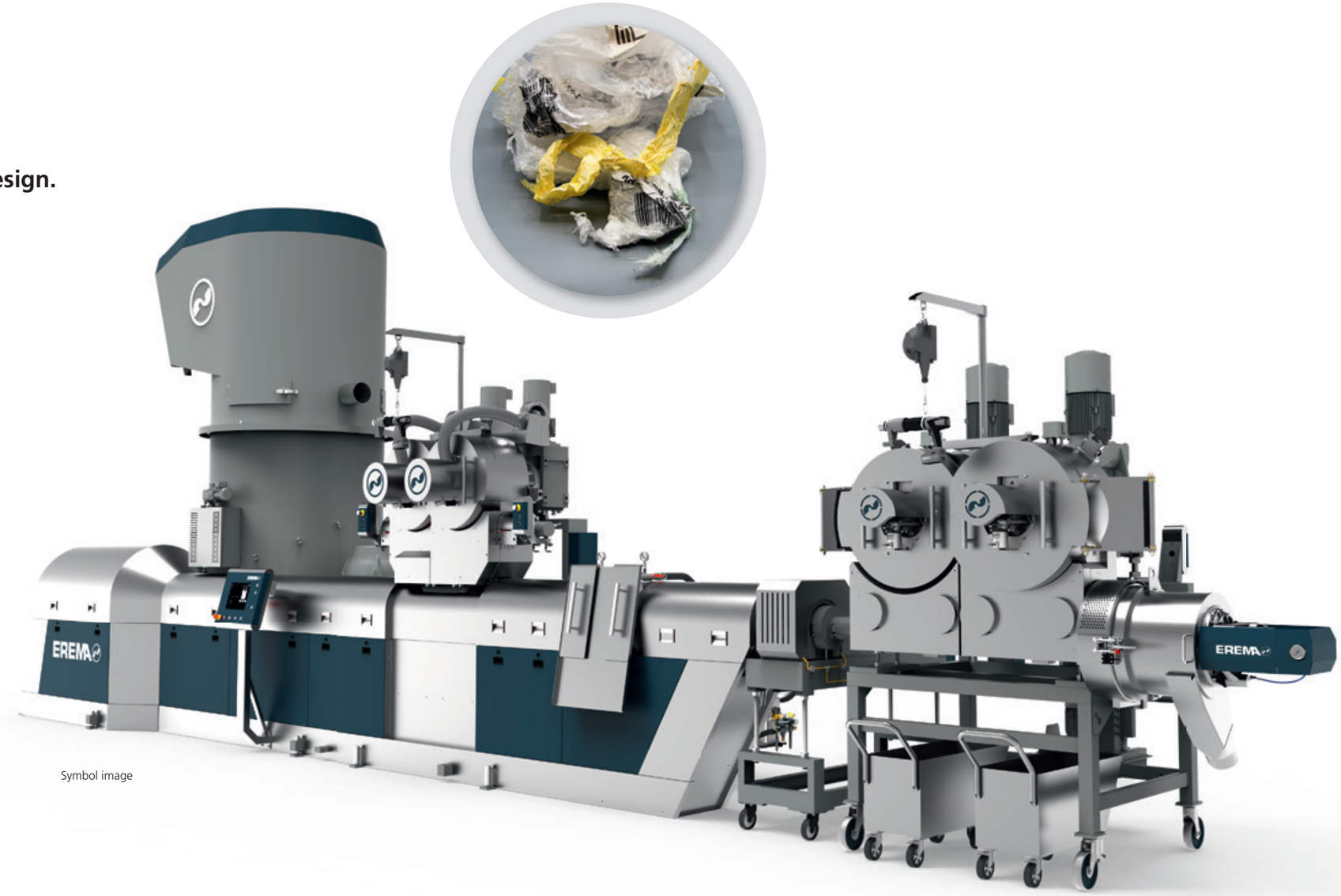
For the finest double filtration quality in a compact design.

The innovative INTAREMA® TVEplus® DuaFil® Compact achieves the finest, double filtration recycled pellet quality in an extremely energy-saving way, and as a result sets the benchmark for production efficiency in post-consumer recycling.

Proven system, enhanced with even more efficiency

Highly flexible and at the same time extremely process-stable, the double filtration machine handles the melt particularly gently, and does so throughout the entire machine. This is the result of combining TVEplus® technology, patented and proven thousands of times over, with the new, patent-pending DuaFil® Compact design. Here, the melt pump takes over the necessary pressure build-up for the second filtration unit, so the extruder no longer needs to do this task and can be made significantly shorter. In turn, this significantly reduces the residence time, the melt temperature and the energy consumption. And brings real advantages to the quality of melt and the recycled pellets.

This makes the machine the first choice for many challenging materials. Especially when the application requires polymer-conserving processing as well as strong filtration performance in order to produce an end product with the best recycling quality.



Symbol image

counter current®

smart start®

ecoSAVE®

SO SHORT. SO GOOD.

INTAREMA® TVEplus®
DuaFil® Compact

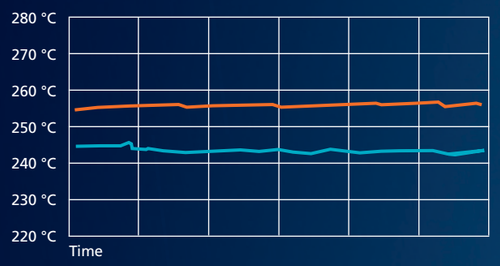
Symbol image

All the advantages at a glance:

Lower melt temperature, less energy: Minus 10 % total unit energy consumption

The INTAREMA® TVEplus® DuaFil® Compact achieves a melt temperature that is 18.5 °C lower upstream of the second filter unit as well as a 10 % lower total energy consumption (specific energy consumption kWh/kg) compared to the previous EREMA double filtration solution (application: LDPE supermarket film containing paper).

Temperature before the second filter unit



— Previous standard double filtration solution INTAREMA® TVEplus® (+ 5 L/D)
— INTAREMA® TVEplus® **DuaFil® Compact**

Top quality recycled pellets thanks to particularly gentle melt treatment

Ideal for post-consumer applications that require polymer-conserving processing as well as strong filtration performance - for end products with the best quality.

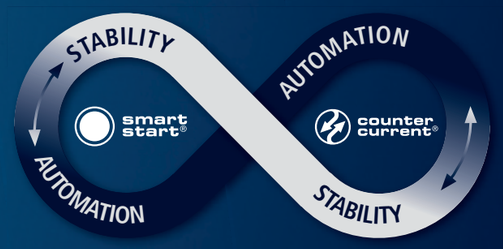
Less odour, less discolouration due to cellulose impurities such as paper or wood particles thanks to significantly reduced melt temperature.

Minus 10 L/D: Much shorter and more compact design

The INTAREMA® TVEplus® DuaFil® Compact is 10 L/D shorter than the previous standard double filtration solution INTAREMA® TVEplus®.

High level of automation: Counter Current and Smart Start ensure high production efficiency and stable processes.

Thanks to the continuous mode of operation and robust design, particularly high machine availability can be achieved when the EREMA Laserfilter is implemented end-to-end for the first and second filter units.



Including all the advantages of **highly efficient TVEplus® technology from EREMA** - Proven thousands of times

The patented extruder system enables trouble-free processing of materials that are otherwise difficult to process. Gentle melt handling, highly efficient filtration, melt homogenisation and high-performance degassing are performed in a single step. The innovative basic principle of TVEplus® technology: the first melt filtration takes place upstream of extruder degassing. As a result, end products can be produced with the best quality and the highest possible recyclate content.

HOW IT WORKS

INTAREMA® TVEplus®
DuaFil® Compact

Intelligently combined: The extruder configuration in the patented TVEplus® combined with the new, patent-pending DuaFil® Compact design makes the machine the double filtration benchmarkin terms of energy efficiency, melt quality and compactness.

1. Ideal material preparation in the **PreConditioning Unit**

Cutting, homogenising, heating, drying, compacting, buffering and dosing – in a single stage. The dynamically controlled PreConditioning Unit (PCU) is multitalented. It prepares the plastic ideally for the extruder and sets the course for consistently high end product quality already at the beginning of the recycling process.

Counter Current technology

The heart of the preconditioning unit is our patented Counter Current technology. Thanks to the changed direction of rotation, the extruder handles more material in a shorter time. Thanks to the optimised intake system a wide range of materials can be processed. At amazingly low temperatures, with great process stability, high throughput and absolute flexibility.

2. **Gentle melting** with low shear stress

Thanks to the preconditioning unit the extruder is fed warm instead of cold. The advantage over conventional systems: a relatively short extruder screw is enough to melt the already dry and thoroughly warmed material. The shear stress is extremely low as a result while the melt quality is high.

3. Melt properties are ideal for **highly efficient filtration**

High-performance filtration: Part 1

Efficient filtering is one of the central strengths of the new DuaFil® Compact. Thanks to the gentle preparation in advance the EREMA high-performance Laserfilter has an easy time. That is because dirt particles and impurities such as paper (e.g. from labels), fragments of wood (e.g. from pallets) and foreign polymers are hardly reduced in size beforehand and are therefore large enough for them to be easily removed from the melt. Thanks to the ingenious design of the Laserfilter scraper geometry, contaminants are lifted particularly quickly and continuously – and thus filtered even more effectively.

The early removal of unwanted materials means they can later no longer outgas and no unpleasant smells develop – a decisive quality bonus for the melt.

4. **Perfect homogenisation** of the melt

The final homogenisation of the melt in the Plus Zone of the extruder, i.e. downstream of the first filtration unit and upstream of degassing, enhances the subsequent degassing performance and improves the characteristics of the melt.

5. **Degassing:** Particularly effective thanks to **DuaFil® Compact**

Temperature advantage

The new DuaFil® Compact features impressive, high-performance degassing. This takes place very effectively in three stages: initial degassing already occurs in the preconditioning unit. Step two is reverse extruder degassing – made possible through optimised screw design. The final double venting degassing at the extruder is particularly effective and removes gas inclusions which are still present from the melt.

Thanks to the design of DuaFil® Compact, the degassing system is particularly effective. This is because implementing the downstream melt pump results in a decoupling of pressure and temperature build-up. This means that - in contrast to other double filtration solutions - the highest temperature in the system is not at the tip of the extruder screw (before the second filtration unit), but already in the "Plus Zone" of the extruder, i.e. upstream of degassing. This ingenious arrangement counteracts the subsequent outgassing of melt components - a clear advantage for the quality of the melt and recycled pellets.

6. **Melt pump** for temperature reduced pressure build up

Because there is no discharge metering zone and the melt pump is custom designed to the application, the pressure build-up required for the second filtration unit is highly efficient and needs only a much lower temperature*. The extruder therefore does not need to build up pressure and can be built much shorter (minus 10 L/D compared to the previous EREMA double filtration solution). Another advantage of the melt pump handling pressure build-up is that the extruder speed can be optimally matched to the polymer - without compromising on throughput.

The lower melt temperature of the DuaFil® Compact in this area significantly reduces energy consumption. That has a positive effect on the quality of the melt.

This is reflected in the lower tendency to develop unpleasant odours or discolouration, which is much higher in systems that operate at higher temperatures. This is a real quality bonus, especially in applications involving cellulose-based materials such as paper or wood - such as in supermarket film recycling, for example.

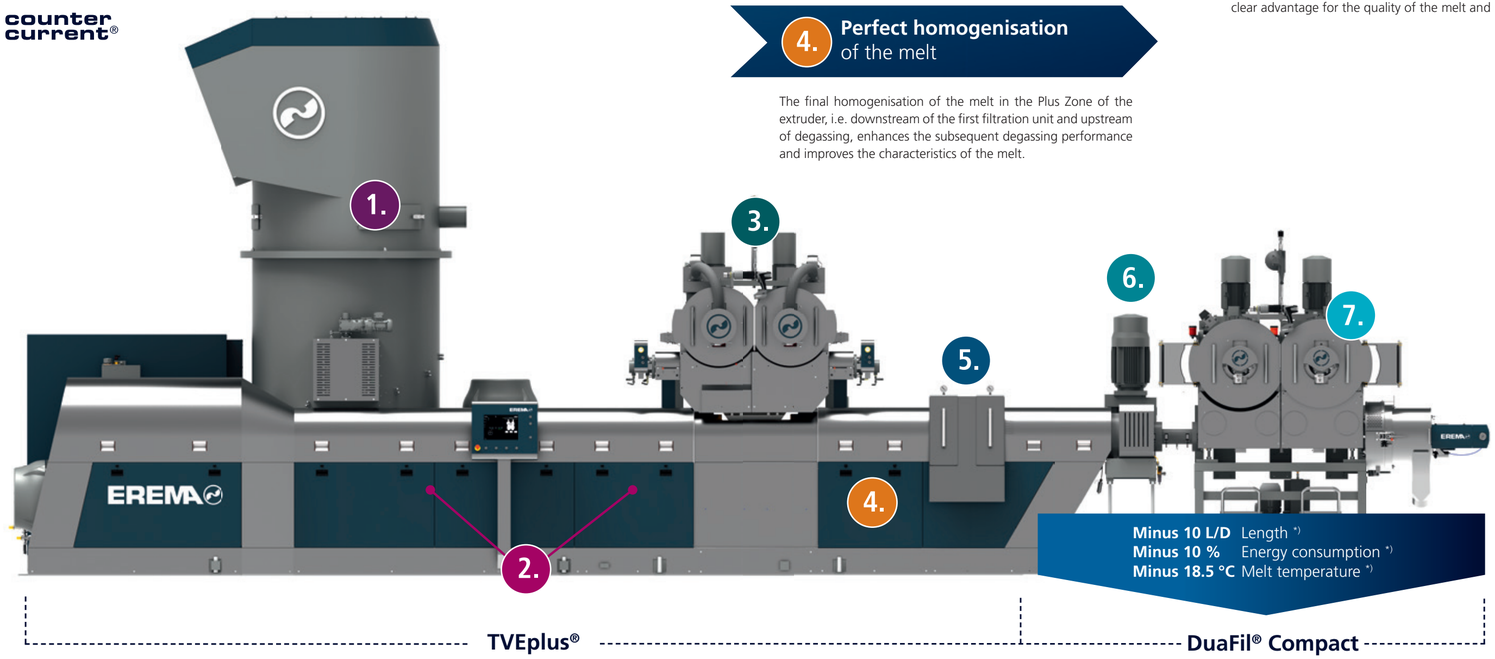
Another bonus of the plant design is the particularly advantageous location of the melt pump in the TVEplus® process sequence: filtration > degassing > melt pump. This is because only cleaned and degassed melt flows through the melt pump – an advantage for the service life of this component.

MINUS 18.5 °C MELT TEMPERATURE *)

MINUS 10 % ENERGY CONSUMPTION *)

AGAINST ODOUR AND DISCOLOURATION

counter current®



7. **Second filtration unit** for top quality recycled pellets.

High-performance filtration: Part 2

In the second filtration unit, the already degassed plastic melt is filtered again at the ideal pressure, which is built up by the energy-saving melt pump. This additional filtration step significantly raises the quality level of the recycled pellets. This supports further processing into end products of particularly high quality.

The high quality of the recycled pellets offers the opportunity to increasingly replace virgin material with especially high-quality recycled material in the new product - in line with the current market trend and sustainability principles.

*) Compared to the previous EREMA double filtration solution, the new INTAREMA® 1108 TVEplus® DuaFil® Compact achieves an 18.5 °C lower melt temperature upstream of the second filter unit for recycling LDPE supermarket film containing paper, as well as a 10 % lower total energy consumption (specific energy consumption kWh/kg).

IDEAL FOR RECYCLING SUPERMARKET FILM

Advantages due to gentle material handling

Supermarket film contaminated with labels

Properties:

- Stretch and shrink film from packaged pallets, mainly LDPE/LLDPE
- Large (pressed) film sections
- High and varying moisture (also because material is stored outdoors)

- Contamination: Paper labels (up to 5 %), Wood particles (from pallets)
- Foreign polymers (e.g. strapping strips), dust, etc.

Efficient processing with DuaFil® Compact

The particularly gentle handling of the plastic melt by the **INTAREMA® TVEplus® DuaFil® Compact** (see "How it works" for details) is a real quality advantage in processing the demanding application of supermarket film:

- **Removal of moisture before extrusion**
  In the Preconditioning Unit, the large film sections are cut, heated and dried. This removes moisture from the film and continuously fills the extruder with heated, pre-compacted material.

- **Processing temperature, pressure and shear forces stay low**
  Thanks to gentle melting process, the selected machine set-up and the short, compact design of the entire extruder, pressure, shear forces and melt temperature remain particularly low.

- **Against odour and discolouration: Every degree less counts**
  Most significant is the reduced tendency to develop unpleasant odours or discolouration. Because supermarket film typically contains cellulose solids, such as paper or wood, the temperature-reduced operation of the DuaFil® Compact is a real advantage compared to higher temperature systems - especially by effectively preventing combustion odours from burnt paper.

- **High efficiency filtration removes paper and wood**
  The gentle melting process makes filtration particularly effective. Thanks to low shear stress, contaminant materials such as paper, wood or foreign polymers (e.g. from strapping bands) are not completely cut upstream of the continuous EREMA laser filter and can therefore easily be filtered out of the melt.

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