English

INTAREMA®
TVEplus®

Recycling system with high-performance degassing

CHOOSE THE NUMBER ONE.

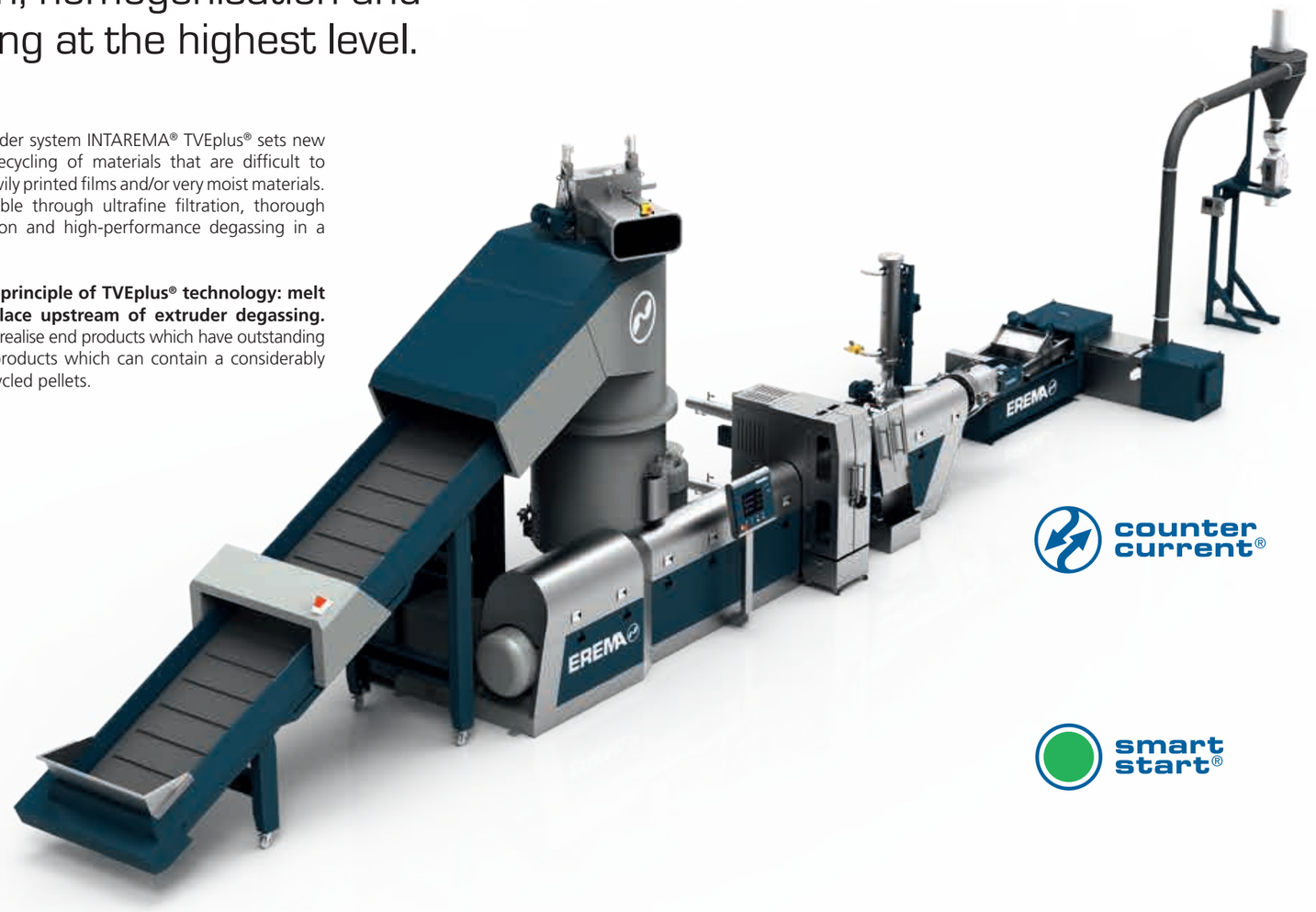
EREMA®
PLASTIC RECYCLING SYSTEMS

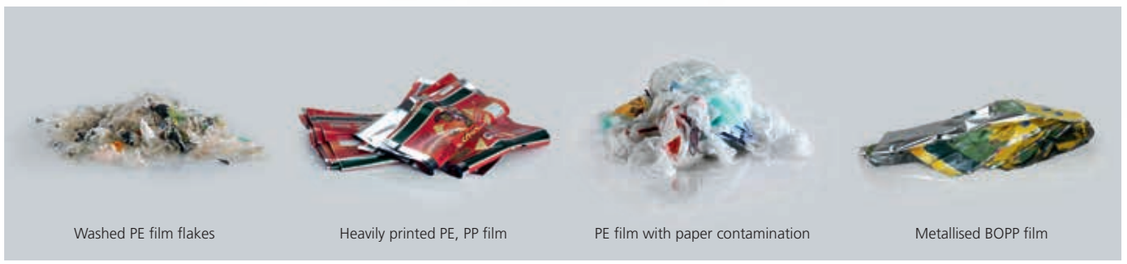
INTAREMA® TVEplus®

Filtration, homogenisation and degassing at the highest level.

The patented extruder system INTAREMA® TVEplus® sets new standards in the recycling of materials that are difficult to process such as heavily printed films and/or very moist materials. This is made possible through ultrafine filtration, thorough melt homogenisation and high-performance degassing in a single step.

The proven basic principle of TVEplus® technology: melt filtration takes place upstream of extruder degassing. This means you can realise end products which have outstanding high quality. End products which can contain a considerably higher share of recycled pellets.





Washed PE film flakes | Heavily printed PE, PP film | PE film with paper contamination | Metallised BOPP film

INTAREMA® at a glance:

1. Counter Current technology

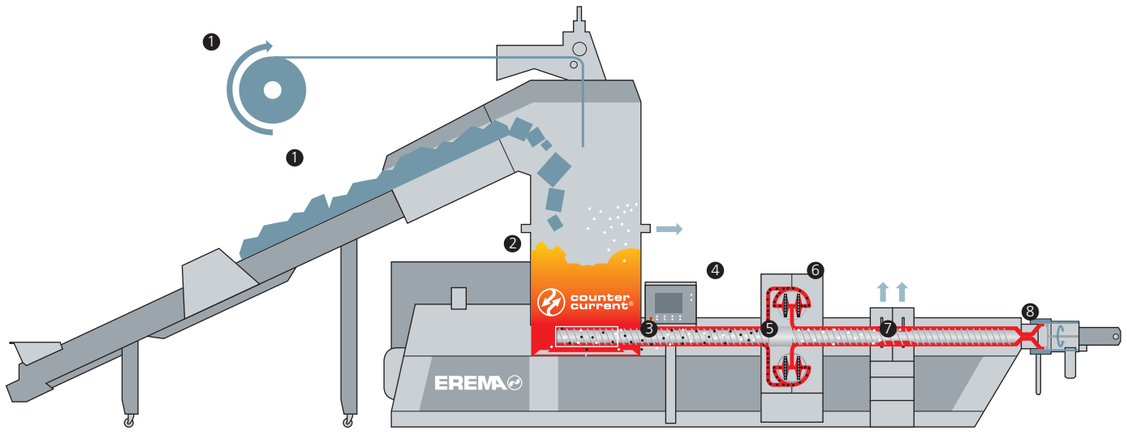
- **Highest process stability through improved material intake** ensures constantly high output over a considerably broader temperature range
- **Higher flexibility** and operational reliability with a variety of materials
- **Increased throughputs** with the same plant size for more productivity

2. Smart Start

- **Remarkably easy to operate** thanks to logical, clearly structured and simplified handling and ultramodern, ergonomic touchscreen display
- **Fewer buttons, more user-friendliness** – thanks to high degree of automation including extensive control packages
- **The right recipe for every application** – saved processing parameters can be loaded easily and conveniently from the recipe management system at the push of a button

3. ecoSAVE®

- **Lower specific energy requirements** thanks to a complete package featuring design and process engineering measures including the new direct drive for the extruder screw
- **Lower production costs** through optimised control technology and high-quality, energy-efficient components such as high-performance motors
- Additionally, the practical **energy display** on your operating panel gives you a constant overview of energy consumption at all times, thus enabling you to take specific measures to optimise consumption
- **Reduced CO_2 emissions** – an important contribution to environmental protection



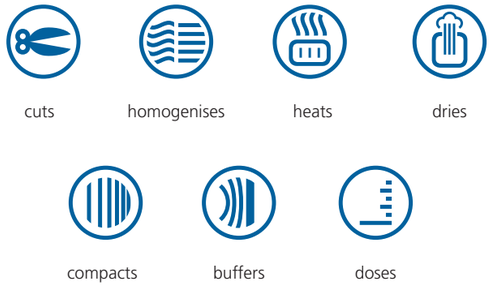
How it works

Feeding ❶ is automatic according to customer requirements. The material is cut, mixed, heated, dried, pre-compacted and buffered in the patented **Preconditioning Unit** ❷. Next, the tangentially connected extruder is filled continuously with hot, pre-compacted material. The **innovative Counter Current technology** enables optimised intake action across an extended temperature range.

The material is plasticised and degassed in reverse in the **extruder screw** ❸. At the end of the plasticising zone the melt is directed out of the extruder, cleaned in the **fully automatic, self-cleaning filter** ❹ and returned to the extruder again. The **final homogenisation of the melt** ❺ takes place after the melt filter. The filtered and homogenised material is degassed in the subsequent **degassing zone** ❻. Following this, and with the help of the **discharge zone** ❼, the melt is conveyed to the **respective tool** ❽ (e.g. pelletiser) at extremely low pressure.

❷ Centrepiece Preconditioning Unit.

The dynamically controlled Preconditioning Unit. For an end product in consistently high quality.

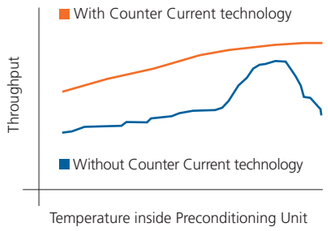


Counter Current – a groundbreaking innovation.

PATENTED

In the past the material inside the Preconditioning Unit turned in the same direction as the extruder: forwards. The patented Counter Current technology now changes the direction of rotation inside the Preconditioning Unit: the plastic material thus moves in the opposite direction to that of the extruder screw. A simple effect with a major impact. Because the relative speed of the material in the intake zone, i.e. when passing from the Preconditioning Unit to the extruder, increases to such an extent that the extruder acts in the same way as a sharp edge which literally "cuts up" the plastic.

The result: the extruder handles more material in a shorter time. Thanks to the enhanced material intake plastic can additionally be processed even at lower temperatures at a high throughput. **Fully in keeping with higher productivity, flexibility and reliability.**



Technical benefits

- **Enhanced material intake, greater flexibility and higher throughput rates** thanks to Counter Current technology
- **Optimised triple degassing** with the patented EREMA Preconditioning Unit, optimum screw design and extruder degassing ensure highly effective degassing of the filtered melt
- **Reduced shearing** before the filter improves filter performance
- **Greater homogenisation efficiency** downstream of filtration and upstream of degassing enhances the subsequent degassing performance and improves the characteristics of the melt
- **Innovative, patented additional technologies for the EREMA Preconditioning Unit** – DD system and Air Flush module (optional) widen the scope of application

Economic benefits

- **High-quality end product** even with materials that are difficult to process such as heavily printed films and/or very moist materials; end products can contain a considerably higher share of recycled pellets
- **Extremely easy operation and maximum user-friendliness** with the Smart Start principle
- **ecoSAVE® reduces energy consumption by up to 12 %** as well as production costs and CO_2 emissions as a result
- **Considerably higher outputs with the same screw diameter** compared to conventional degassing extruders
- **Compact, space-saving design**

Optimised triple degassing

- Initial **degassing in the EREMA Preconditioning Unit** takes place through preheating and predrying the material
- The optimum screw design – tuned to the material to be processed – enables **reverse degassing in the Preconditioning Unit**, thus relieving the degassing zone of the extruder
- Gas inclusions in the melt are removed in the **extruder degassing zone**
- Only **thoroughly melted, filtered and homogenised material** can pass the degassing zone of the extruder

Blown film test with recyclates, made from fully printed PE-LD film:

Single-screw extruder with standard degassing

INTAREMA® TVEplus® – no quality impairments through fish eyes!

High filtration performance thanks to reduced shearing upstream of the melt filter

The melting procedure takes place with minimum shearing effect. This prevents any further size reduction of disturbing contaminants prior to filtration and enhances filtration efficiency. A comparison test with washed post consumer films (film sample with 100 % recycled pellets), filtered with the EREMA Laserfilter (110 µm), confirms this increased filtration performance thanks to minimal shearing.

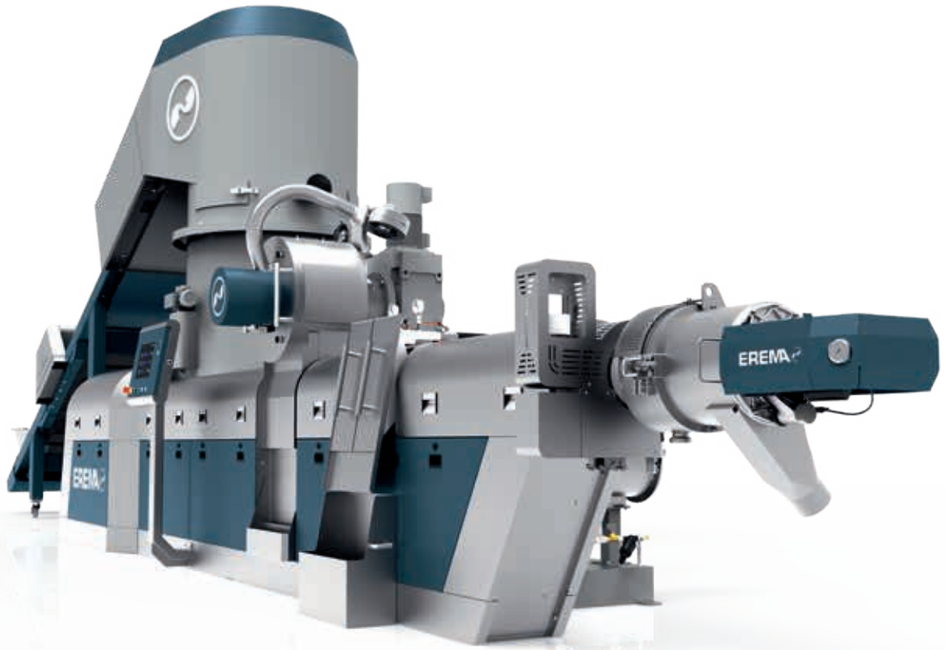
Single-screw extruder with standard filtration

INTAREMA® TVEplus® – no disturbing contaminants

Technical data INTAREMA® TVEplus®

Post Consumer & Industrial Recycling	Film: INTAREMA® TVEplus®					
	Average output capacity in kg/h*					
Systems available	LDPE, LLDPE film		HDPE film		PP film	
	min	max	min	max	min	max
1007 TVEplus	350	430	300	350	390	470
1108 TVEplus	440	550	400	450	500	600
1310 TVEplus	700	850	650	750	750	900
1512 TVEplus	950	1200	850	920	1050	1250
1714 TVEplus	1250	1550	1100	1220	1400	1650
1716 TVEplus	1500	1900	1400	1550	1800	2100
2018 TVEplus	1900	2400	1700	1900	2200	2600
2021 T-VEplus	2400	3000	2200	2500	3000	3500
2325 T-VEplus**	3200	3700	2600	3100	3600	4000

*) all output capacities are examples, output capacity depending on material properties such as residual moisture, print, degree of contamination, etc.
**) only film monopolymer application possible



Innovative, patented additional technology for the EREMA Preconditioning Unit (optional)

- **The patented Air Flush Module increases drying performance** and output while ensuring lower energy consumption and extending plant service life
- With **patented Double Disc (DD) technology** materials with up to 12 % residual moisture can be processed with consistently high output
- **Optimised large EREMA Preconditioning Unit**

Technical data INTAREMA® TVEplus® RegrindPro®

Post Consumer & Industrial Recycling	INTAREMA® TVEplus® RegrindPro®							
	Average output capacity in kg/h*							
Systems available	HDPE bottles MFI > 1.6 g/10min (5kg/190°C)		PP		HIPS		ABS / PC	
	min	max	min	max	min	max	min	max
1007 TVEplus	230	325	350	430	390	470	350	430
1108 TVEplus	440	550	500	650	500	650	500	550
1310 TVEplus	725	850	750	1000	750	1000	750	850
1512 TVEplus	950	1200	1050	1400	1050	1400	1050	1250
1714 TVEplus	1250	1550	1400	1800	1400	1800	1400	1750
1716 TVEplus	1500	1900	1800	2200	1800	2200	1800	2000
2018 TVEplus	1900	2400	2200	2800	2200	2800	2200	2500
2021 T-VEplus	2400	3000	2800	3500	2800	3500	2800	3300
2325 T-VEplus**	3200	3700	3600	4000	3600	4700	3600	4000

*) all output capacities are examples, output capacity depending on material properties such as residual moisture, print, degree of contamination, etc.
**) only regrind monopolymer application possible

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