



**RECYCLING LINE** recoSTAR PET art | FG

for post-consumer PET bottle flakes, preform and sheet flakes, FIFO pre-drying, single screw extrusion, FIFO Solid State Polycondensation, high-end bottle-to-bottle recycling, automatic food-grade monitoring



## RECYCLING LINE recoSTAR PET art



**High-end bottle-to-bottle recycling line** for the recycling of **post-consumer bottle flakes** after the washing process. The end product is melt-filtrated, uniform granulate of **highest purity and lowest VOCs**.



**FIFO pre-drying** of the PET bottle flakes ensures optimal preparation for subsequent extrusion. Single-stage drying with hot, desiccant air according to the First-In First-Out principle.



**Single-screw extrusion** with short melt phase. The melt pump increases the overall output, stabilizes the melt pressure and ensures a consistent process and melt quality.



**Backflushing melt filters** remove solid contaminants. They are designed for straight melt flow and work with an automatic self-cleaning procedure triggered by melt pressure. Cartridge filters are an option for increased filtration surface in a compact housing.



**The underwater pelletizer** produces spherical pellets. The downstream inline crystallizer takes advantage of the embedded melt energy and crystallizes the pellets without the need of external heat. Pellet size and bulk density are adjustable.



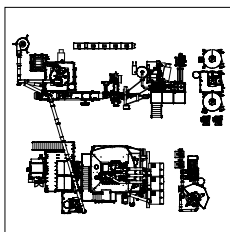
**Solid State Polycondensation** enables consistent and adjustable IV increase with the FIFO principle. Outstanding decontamination for bottle-to-bottle application. Acetaldehyde and other VOCs are reduced to the levels of virgin resin.



\* Machines pictured may include equipment sold as options.



**Energy efficiency** is ensured by various design features. Energy recovery is available for the pre-heater of the SSP and the final pellets. Energy sources such as natural gas or steam can be used as a cost-friendly alternative for electrical heating.



**Compact design:** The set-up of the recycling line is flexible, most popular options are L, U, or line shape. Each layout option utilizes minimal footprint while maintaining access to relevant operation and maintenance points.



**Easy maintenance:** High up-time and machine availability are key for low production costs. Smart solutions such as dry vacuum pumps or open loop desiccant air flow reduce maintenance requirements to a minimum.

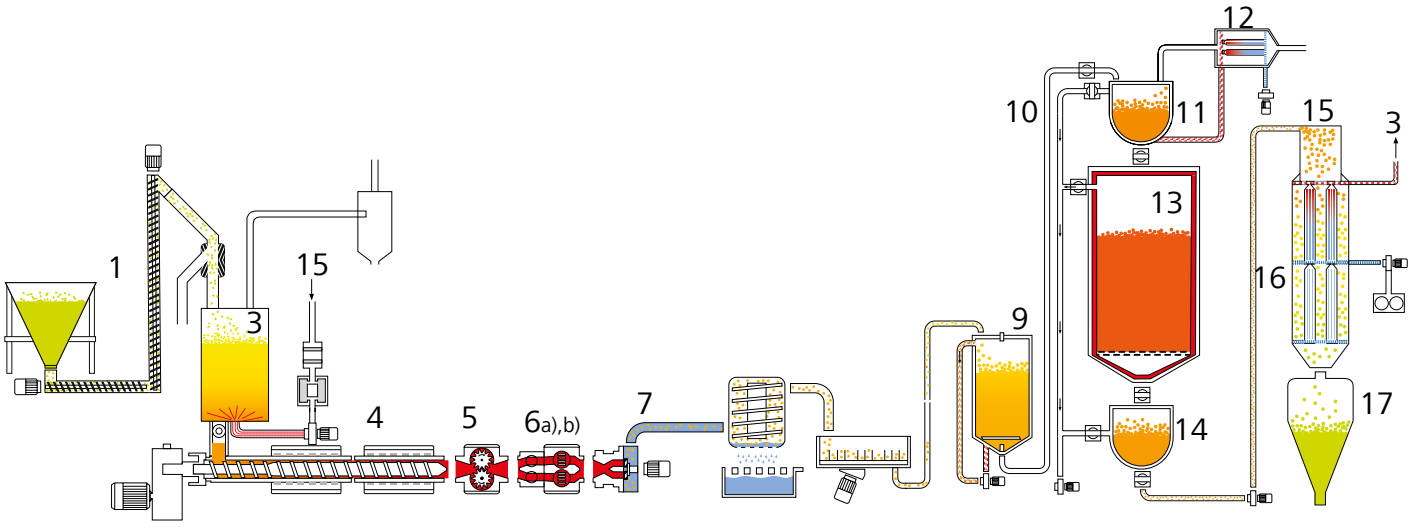


**RECYCLING LINE**  
**recoSTAR PET art**

Food contact	FDA/EFSA	Decontamination/ VOC	Brand owner approved	Low AA level	IV increase
✓	✓	✓✓✓	✓	✓✓	✓✓✓ with full output

**1-stage drying – hot and dry air**

PET flakes are heated and dried in a single-stage process with hot and desiccant air. The special design of the dryer outlets results in center flow prevention, consistent residence time and FIFO processing, ensuring ideal preparation for the extrusion process. A choice of filtration and pelleting systems are available. The downstream inline vacuum SSP reactor uses the energy of the previous step. Special FIFO design ensures consistent reaction parameters, adjustable IV increase as well as highly effective decontamination (ultra-low VOC, AA < 1 ppm) for bottle-to-bottle and other food contact applications.

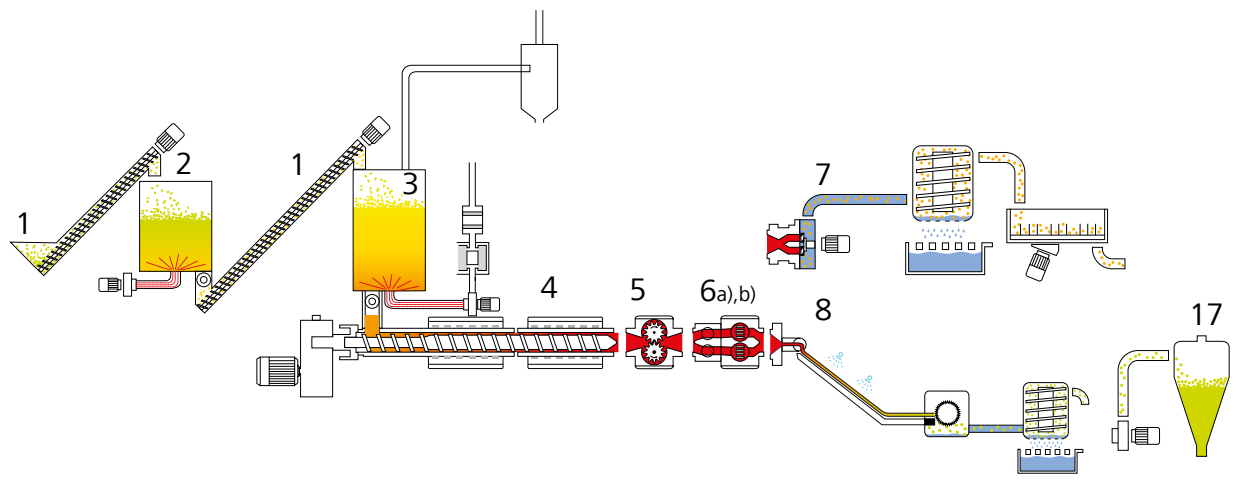


**RECYCLING LINE**  
**recoSTAR PET FG**

Food contact	FDA/EFSA	Decontamination/ VOC	Brand owner approved	Low AA level	IV increase
✓	✓	✓		optionally	✓ with reduced output

PET flakes are heated and dried in a two-stage process, first with hot air, then by means of hot and desiccant air. The special design of the dryer outlets results in center flow prevention, consistent residence time and FIFO processing. This ensures decontamination for food contact applications and ideal preparation for the extrusion process with IV increase. A choice of filtration and pelleting systems is available. Once installed, the machine can later be retrofitted with an SSP reactor to increase viscosity and decontamination levels.

**2-stage drying – hot air, hot and dry air**



Application examples  
for recoSTAR PET art



1. Feeding screw
2. Hot air drying unit
3. Combined drying unit
4. Extruder
5. Melt pump
- 6.a) Melt filter with backflush
- 6.b) Cartridge melt filter with backflush
7. Underwater pelletizer with inline crystallization
8. Automatic strand pelletizer
9. Post-crystallization unit
10. Separate vacuum feeding system
11. SSP preheater
12. Heat exchanger for preheater
13. SSP reactor
14. Discharge unit
15. Energy recovery kit
16. Pellet water cooler
17. Storage silo

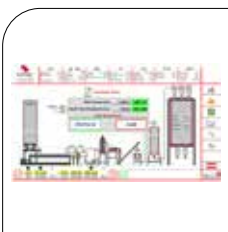


Application examples  
for recoSTAR PET FG

Online monitoring, data logging and reporting



**recoSTAR technology** is designed for **high automation** and **user-friendliness**. The touch screen enables a simple start-stop procedure, features RFID tags with individual user levels and allows taking screenshots (USB port). This ensures **highest efficiency** and consequently **fast ROI**. Features are either standard or can be added according to customer's requirements.



**Automatic monitoring of** food-grade relevant process parameters in case of deviations, the material is automatically rejected. Consequently, only food-safe material is produced.



**inline viscosimeter** continuously measures the IV of the PET melt during extrusion. This helps to control quality and indicates any required change of settings.



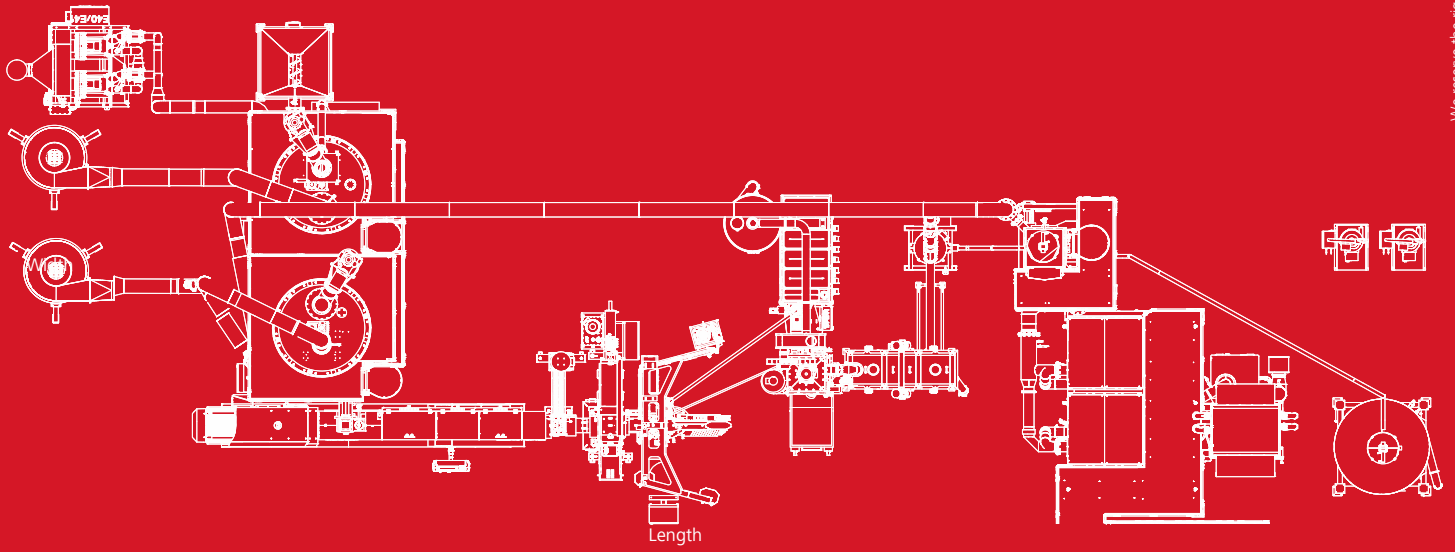
**Online color measurement** color deviations from a set standard are detected, serving as an inline quality control of the input material. Deviations can be offset by adding additive (either liquid or masterbatch).



**The starLOGGER online** writer is used to record and visualize real-time and historical telemetry data. 50 parameters can be stored in short intervals in an internal memory.



**Production monitoring and reporting** relevant production data such as speeds, pressures, temperatures, vacuum levels, output, alarms ect. They can be handed over to a centralized plant monitoring system with MOD-BUS or other protocols.



**Dimensions**

**recoSTAR PET FG**

Type	125	165	215	265
Height [mm]	10500	12000	10500	12000
Height [feet]	34'5"	39'4"	34'5"	39'4"
Length x Width [mm]	27000 x 10000	28000 x 10000	30000 x 12000	30000 x 15000
Length x Width [feet]	88'7" x 32'10"	91'10" x 32'10"	98'5" x 39'4"	98'5" x 49'3"

Type	125	165	215	265
Output [kg/h]	850 - 1000	1600 - 1800	2500 - 2800	3500 - 3800
Output [lbs/h]	1850 - 2200	3500 - 4000	5500 - 6200	7700 - 8400
AC drive [kW]	200	355	560	800

**Extruder**

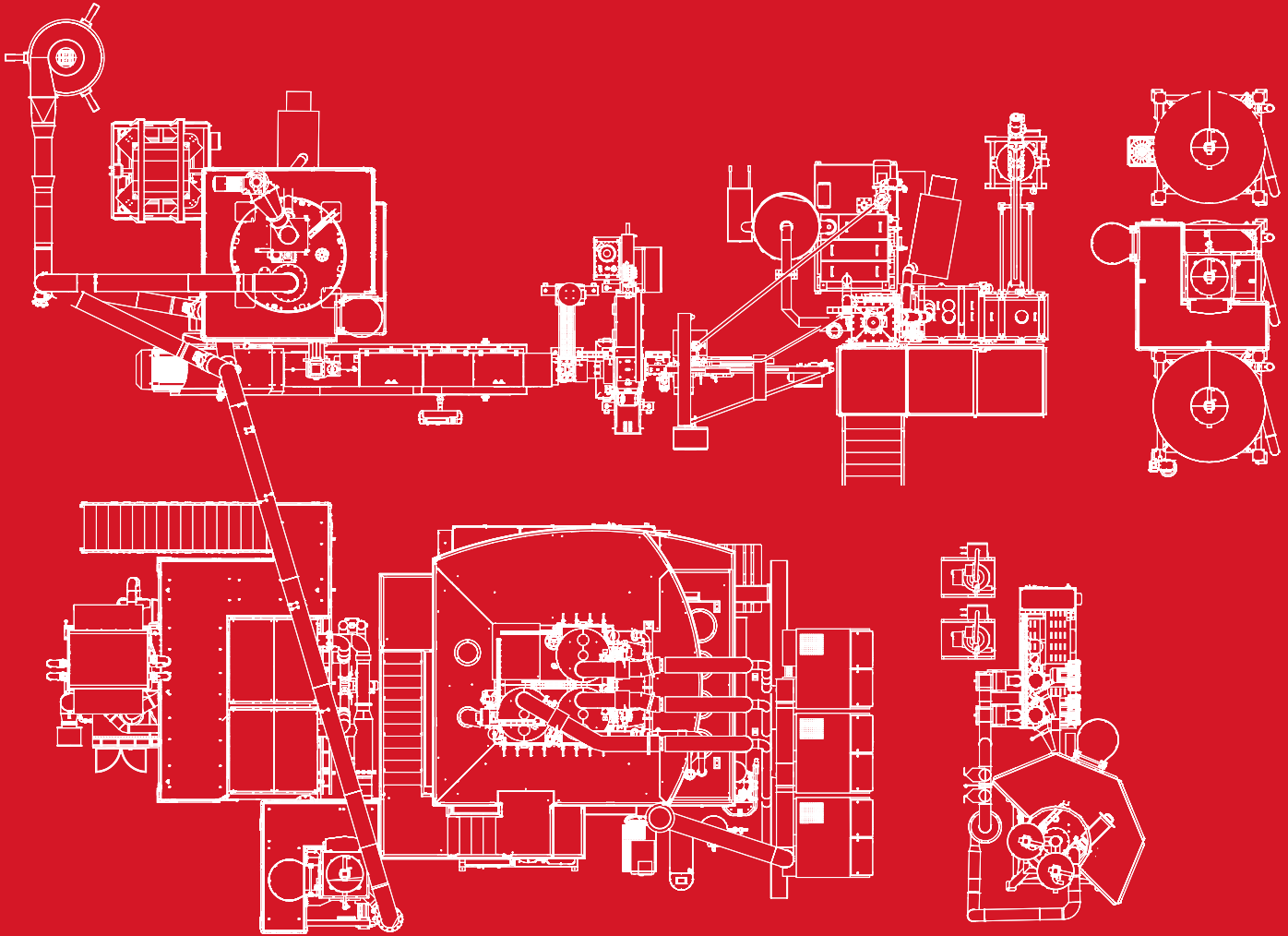
Screw diameter (L/D) [mm]	125 (28)	165 (28)	215 (28)	265 (28)
Screw diameter (L/D) [inch]	5 (28)	6.5 (28)	8.5 (28)	10.5 (28)

<b>Energy consumption [kWh/kg]</b>	<b>0.25 - 0.30</b>	<b>0.25 - 0.30</b>	<b>0.25 - 0.30</b>	<b>0.25 - 0.30</b>
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**Downstream equipment**

Underwater pelletizer	●	●	●	●
Automatic strand pelletizer	alternative	alternative	alternative	alternative

● standard



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<b>recoSTAR PET art</b>				
<b>Type</b>	<b>125</b>	<b>165</b>	<b>215</b>	<b>265</b>
<b>Dimensions</b>				
Height [mm]	13300	14000	16200	14000 / 16200
Height [feet]	43'6"	45'9"	53'2"	45'9" / 53'2"
Length x Width [mm]	22000 x 20500	23000 x 20500	30000 x 25000	30000 x 30000
Length x Width [feet]	72'2" x 67'3"	75'6" x 67'3"	98'5" x 82'	98'5" x 98'5"
Output [kg/h]	1000 - 1200	1900 - 2100	3000 - 3200	4300 - 4500
Output [lbs/h]	2200 - 2650	4200 - 4650	6600 - 7050	9500 - 9950
AC drive [kW]	200	355	560	800
<b>Plant energy consumption [kWh/kg]</b>		0.36-0.40		
<b>Extruder</b>				
Screw Diameter (L/D) [mm]	125 (28)	165 (28)	215 (28)	265 (28)
Screw Diameter (L/D) [inch]	5 (28)	6.5 (28)	8.5 (28)	10.5 (28)
<b>Downstream equipment</b>				
Underwater pelletizer	x	x	x	x
Automatic strand pelletizer	alternative	alternative	alternative	
Reactor size	120 / 150	200 / 250	350	2x250 / 2x350
Preheater quantity	2	3	4	2 x 3