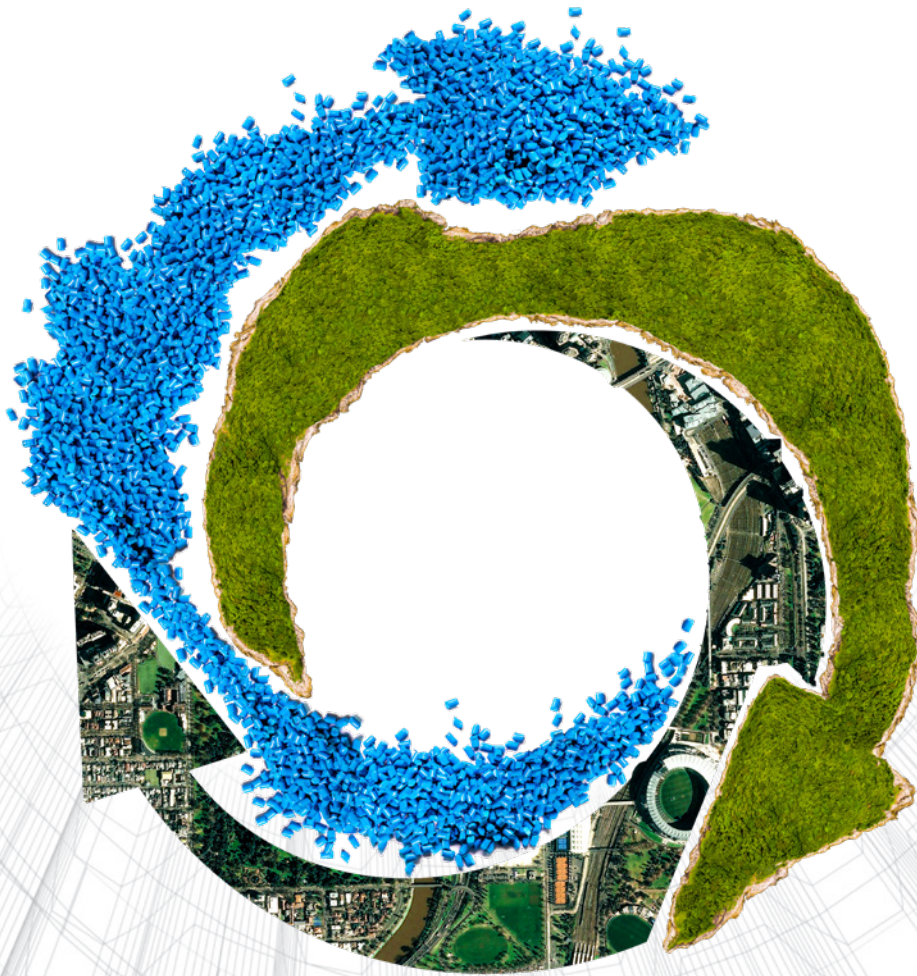


REVOTECH[®]

Revolutionary Recycling Technologies



BANDERA
EXTRUSION INTELLIGENCE

SUSTAINABILITY

is not only a word,
it is a call to action

How to make it profitable?

In the extrusion industry,
ECOlogical can be **ECO**nomically viable.



How?



Through

Technology



Collaboration



Ongoing research & innovation

Customer oriented approach

Let's build NOW our common future.



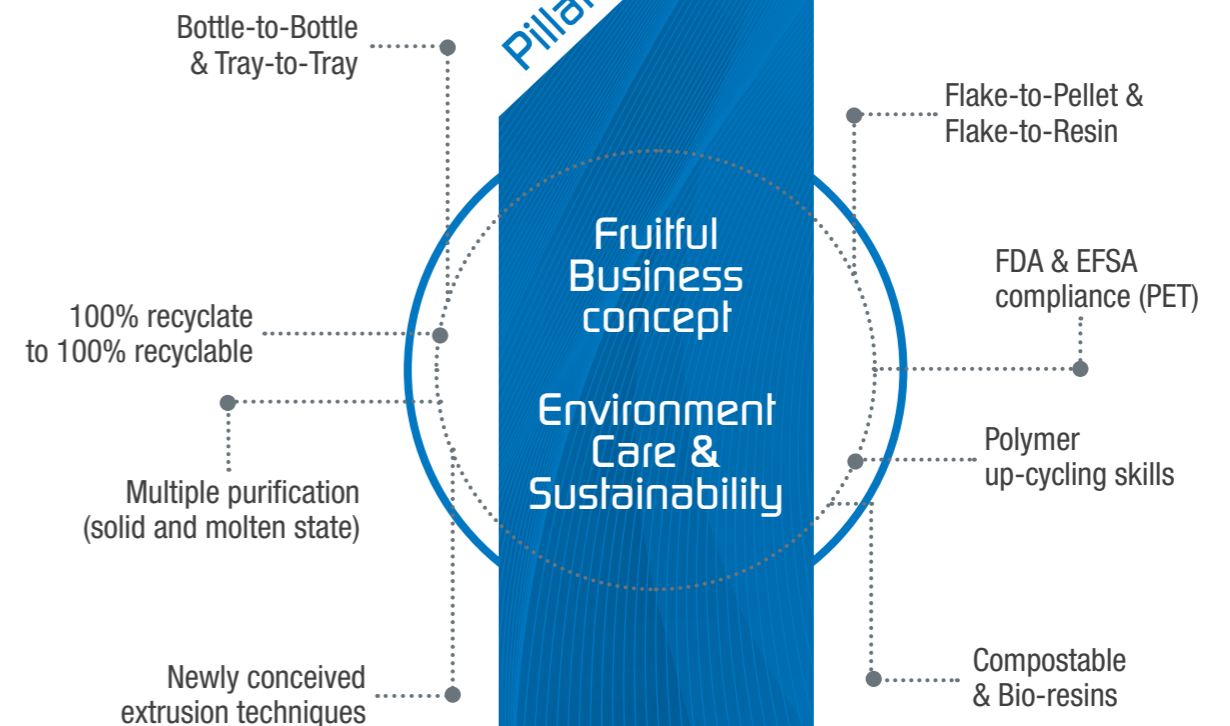
“Extruding Future
Plastics Now®”

Bandera established a highly effective centre of excellence for the creation of advanced technologies intended for the plastic industry for the fulfilment of the Circular Economy criteria. **FACTORY, EQUIPMENT and PEOPLE** with focus on innovation and for new profitable businesses.

“THOE -
The House of Extrusion®”

At Bandera HQ since 2015, it is the greatest innovation centre within the worldwide extrusion industry. The 6000 m² area is shaped to boost Bandera and Customers' R&D activities: **a REFINERY of WINNING IDEAS.**

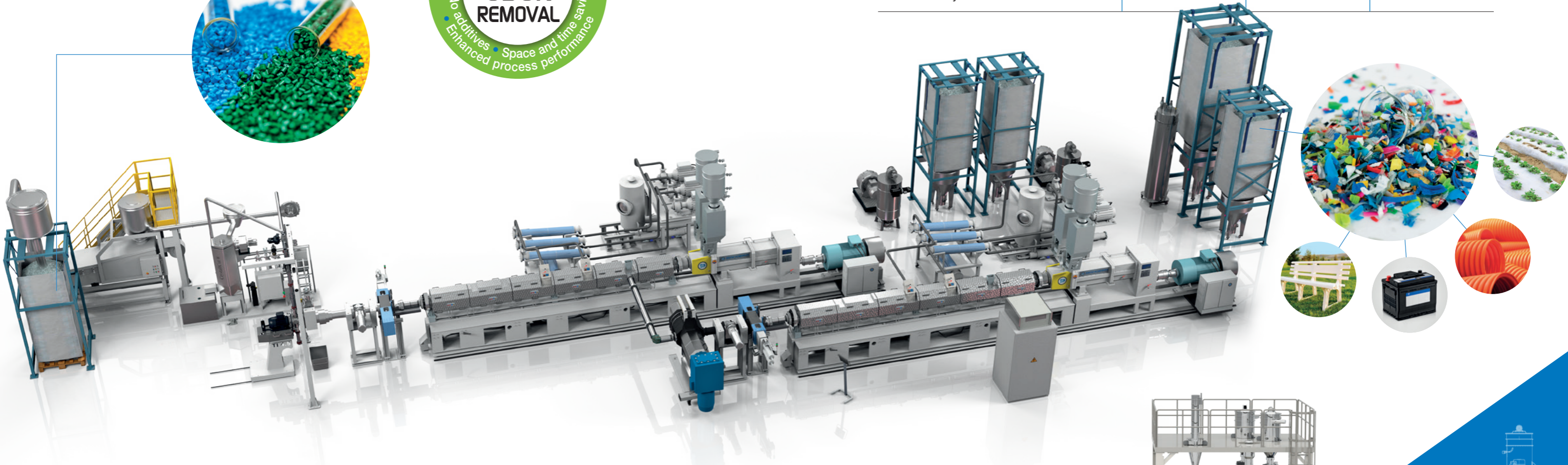
Pillars & Principles



Polyolefin up-cycling process

Post-industrial and/or post-consumer wastes find their virtuous stream.

Differently from the existing recycling/pelletizing equipment currently available in the market, the definitive goal of Bandera technology is the ability to provide a **recycled polymer having quality and pureness comparable to the virgin resin**, sometime even including special features as mineral fillers or fibres inclusion.



Comparison table

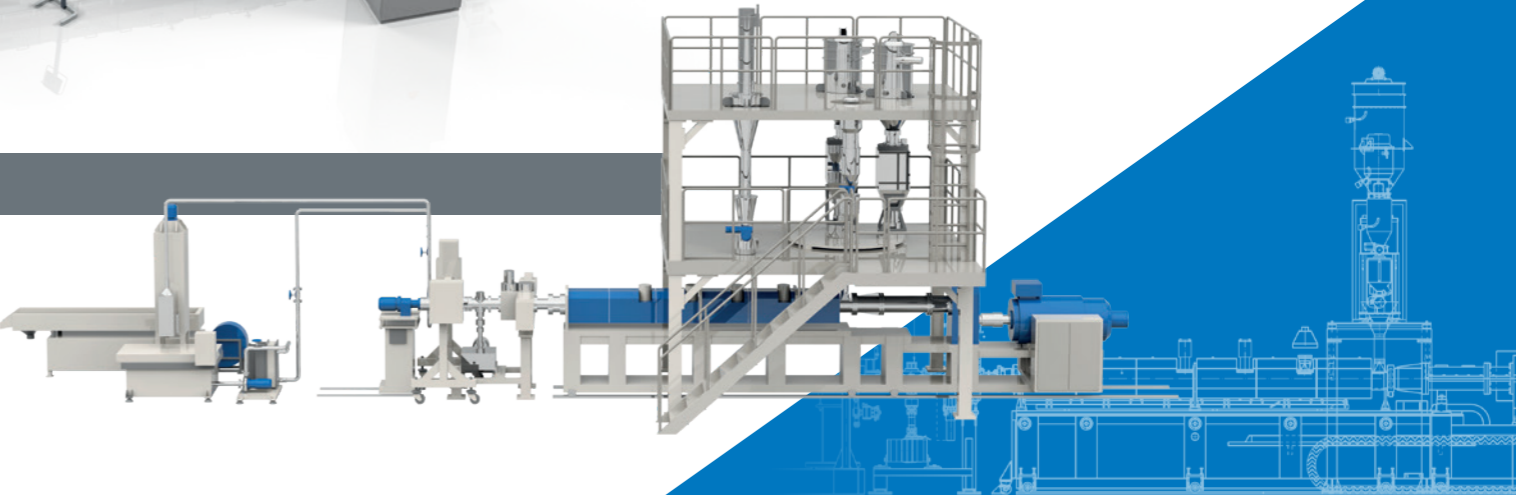
	Single screw extrusion	Twin screw extrusion	Twin screw cascade
Degassing efficacy (molten state purification)	■	■■■	■■■■■
Odour extraction		■■	■■■■
Filtration capacity (mechanical decontamination)	■	■■■	■■■■■
Homogenization skills		■■■	■■■■■
Polymer stress factor (shear, pressure, temperature)	■	■■■■	■■■■■
Compounding ability (dispersion of additives, mineral fillers, fibres, ...)		■■■	■■■■■
Throughput achievable	■	■■■	■■■■■
Self-cleaning features (switch-over time saving)		■■■■■	■■■■■
Energy efficiency	■	■■■■■	■■■■■
Overall flexibility		■■■■■	■■■■■

Single screw limits

The evident limits attributed to **single screw extrusion technologies cannot reach** the new targets specified by Circular Economy guidelines.

Twin screw benefits

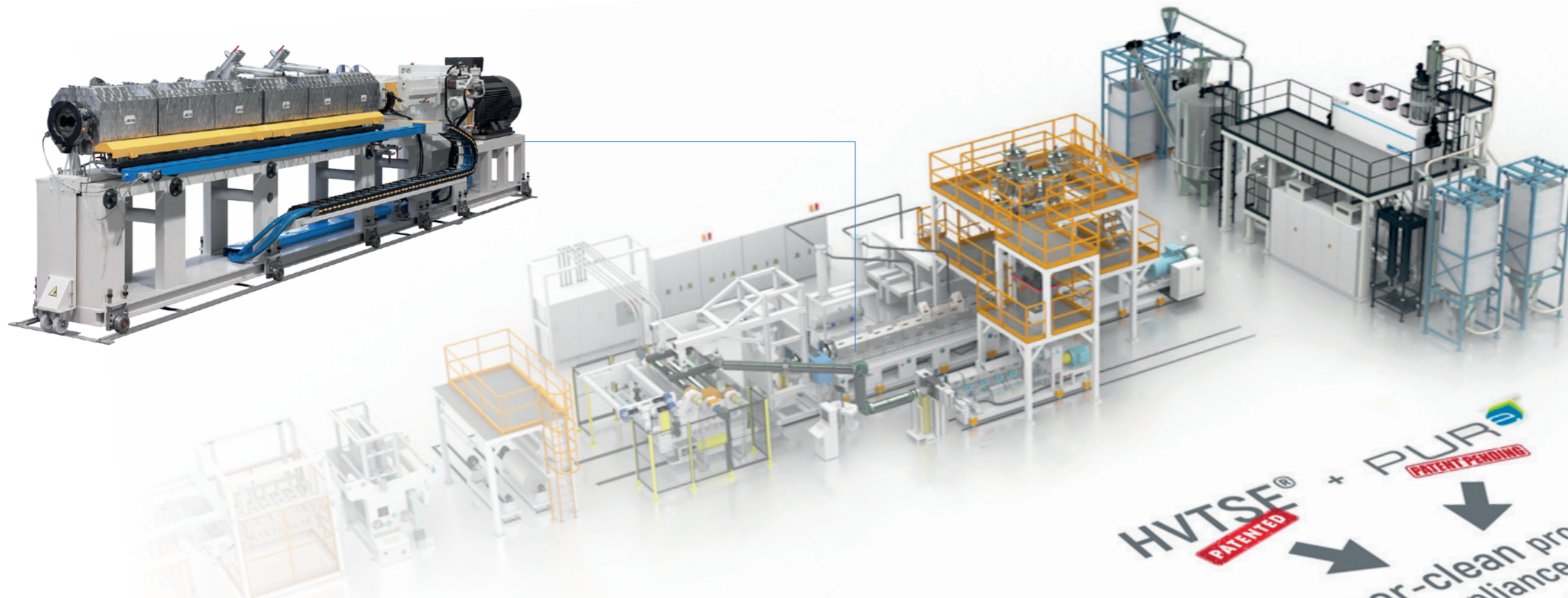
Depending on the raw material features (type and level of contamination, particle dimensions, polymer heterogeneity, etc.) and the final product performances, **Bandera proposes customized solutions** based on its hi-tech twin screw extrusion.



HVTSE®

FDA N.O.L. since 2009 → Powerful melt venting purification
 100% regrind material use → PET-PLA-PP-PS resins producible
 Mild & stress-free process → 0.19 kWh/kg energy rate

- the only real PET dry-less extrusion technology
- the most versatile solution for current and future customers' needs
- the utmost cost-effective solution delivering significant profit results



For the satisfaction of the PET rigid film demand linked to food packaging industries (thermoforming & F.F.S.), the combination of **PURE®** and **HVTSE®** represents the market-leading solution for **PERFORMANCE & PROFITABILITY**.

PURE®

PURE® is a highly effective solid state purification system for PET post-consumer material, fully complying with FDA and EFSA cleaning efficiency requirements.

Bandera R&D and Tech depts. created an outstanding machinery, securing

- use of 100% recycled material for food packaging application
- rational process for easy-to-run condition
- energy consumption: 0.08 kWh/kg (35% less than alternative equipment, great annual saving)
- long lasting components for cost effective maintenance
- modular setup for customized and user friendly installation



Performance

- Highest OEEE grade and flexibility
- Best IV drop ever witnessed
- Deepest purification achievable
- Energy efficient (25% saving)

Profitability

- Long-term investment security
- Market trend-setting position
- Final product with recognized features
- Thrifty industrial costs



Through the combination of its advanced technologies, Bandera created a prime solution to fulfil the highly demanding B-to-B market.

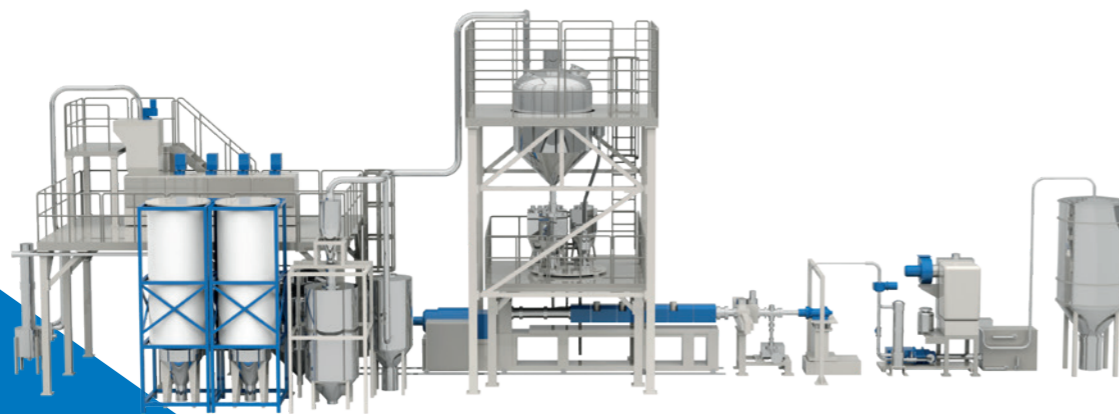
Bottle-to-Bottle

It is important to be different, it is mandatory to do better.

NO thermic & NO shear stress:

Bandera knows how to care about PET, minimizing its degradation and drops, maximizing its purification and structure.

For ensuring the highest qualities of the final product, Bandera solutions foresee both **solid and molten state decontamination** stages with **PUR^e** and **HVTSE^e** integrated technologies.



The standard **Bottle-to-Bottle** scenario adopted by the worldwide recyclers (**Flake-to-Pellet**) is sometime challenged by the **Flake-to-Resin** option, usually requested by the producers of virgin PET material: **Bandera can reliably satisfy this application as well.**

Tray-to-Tray

The cooperation with effective partners confirmed the *Recyclability* of the product.

The modern legislations drive the recycling organizations to create a constructive post-consumer stream (parallel to the PET bottles one) where all PET trays is to be circularly re-used for the production of PET trays.



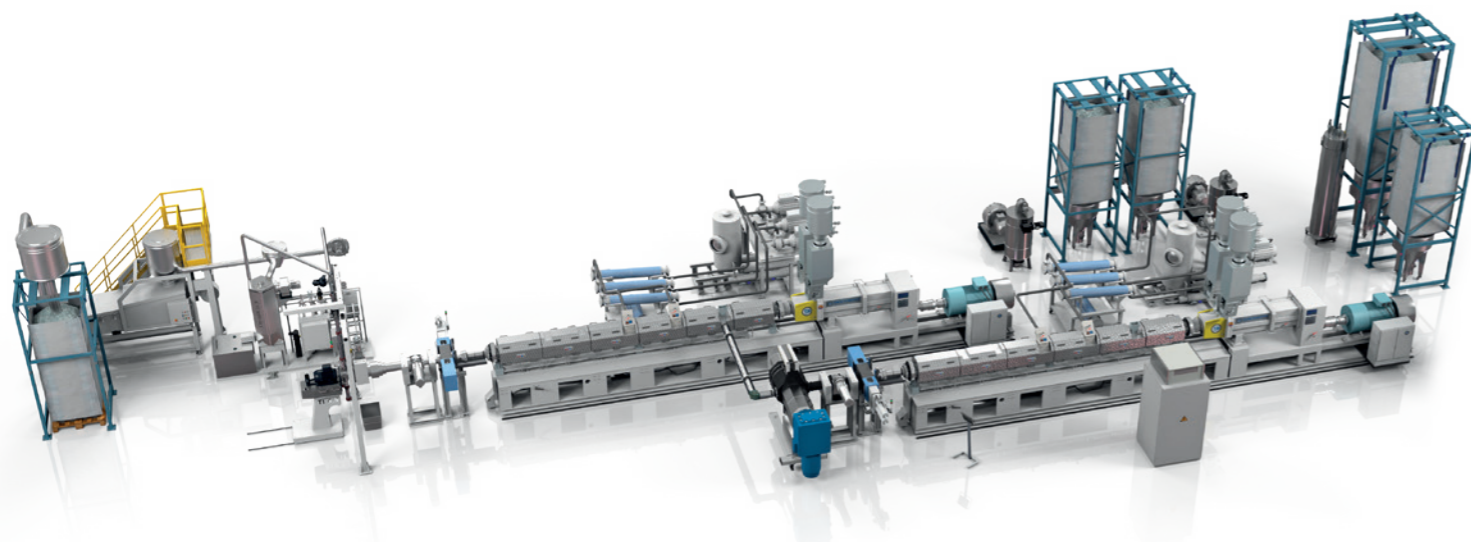
In order to get a real industrial setting (universally valuable and applicable), **all PET trays** - including the ones destined to the production of sealable food packaging - **must not include other polymers generating chemical contamination** (such as specific barrier resins and lamination films).

Bandera proposes an extrusion coating solution processing customizable recipes suitable for the production of **"PET mono-material"** trays with equivalent characteristics to the "multi-material ones" currently present in the market: seal-ability and gas barrier (where needed) are guaranteed, even with better transparency and mechanical features.

Secured performances

- 100% recylate to 100% recyclable
- barrier properties ensured
- fully sealable with top lid film
- transparency guaranteed
- industrial repeatability





EXPERIENCE OUR THOE (The House of Extrusion®)

Test your material
Prove the result
Lead the market



Top packaging and converting solutions



Recycling



Flat Die



Blown Film



Pelletizing



Extrusion
Equipment

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ExtrusionbyBandera



Costruzioni Meccaniche Luigi Bandera



Extrusion Intelligence

BANDERA
EXTRUSION INTELLIGENCE

Costruzioni Meccaniche Luigi Bandera S.p.A.
Corso Sempione, 120 - I-21052 Busto Arsizio (VA) Italy
+39 0331 398111
lbandera@lbandera.com
luigibandera.com

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =



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learn about our products:
<https://www.luigibandera.com/circular-economy/>