

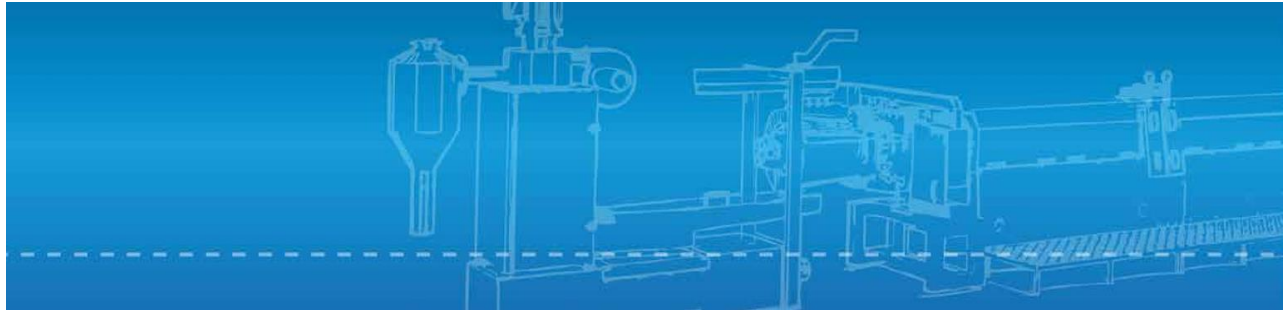


GAMMA MECCANICA

RECYCLING LINES FOR PLASTIC MATERIALS



**Recycling of heavily printed and contaminated post-consumer waste
with Gamma Meccanica's Tandem PLUS technology**

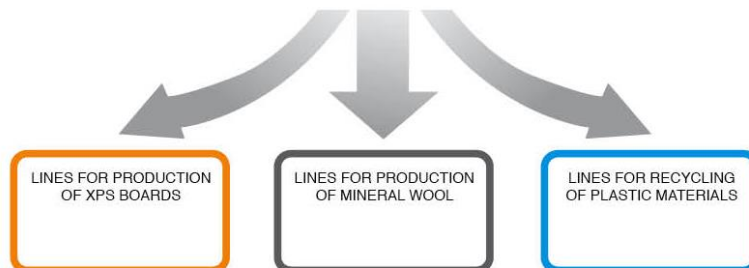


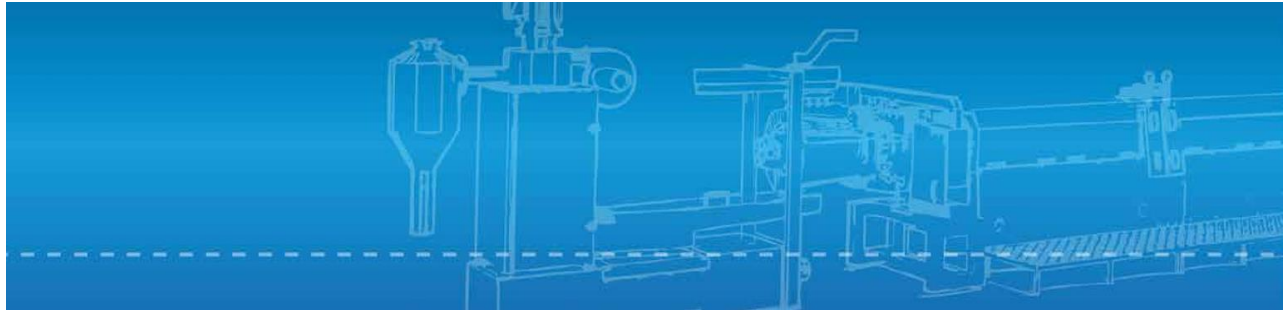
Company Profile

Gamma Meccanica S.p.A., Italian Company established in 1977, consists of three divisions, each one focused on a specific sector:

- ◆ the insulation division designs and produces lines for the production of mineral wools;
- ◆ the extruded polystyrene division is dedicated to the creation of system for the production of XPS boards.
- ◆ the plastic division is specialized in lines for recycling of plastic materials;

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The main types of Gamma Meccanica S.p.A. lines are:



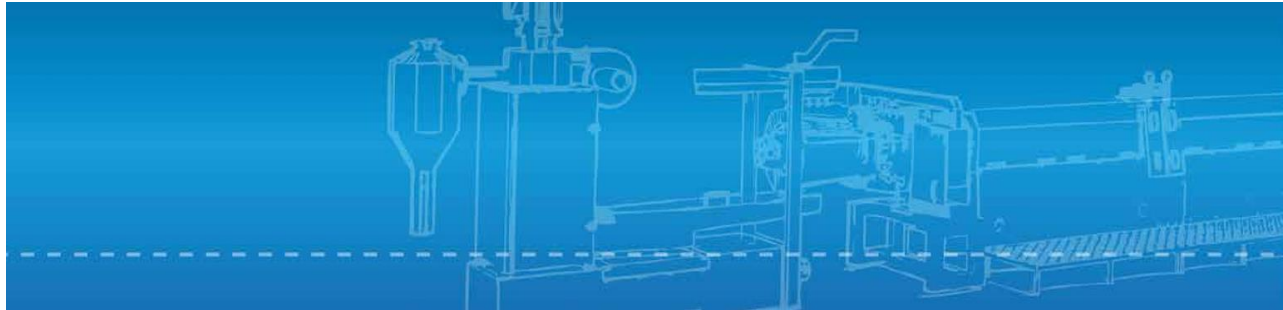
TANDEM lines:
for the recycling of heavily
printed and contaminated
thermoplastics materials, with
high humidity.



COMPAC line:
for the recycling and
compounding of low bulk density
materials with high residual
moisture.



CONVENTIONAL lines AF:
for the recycling of plastics that have
been pre-sized or ground before
processing.



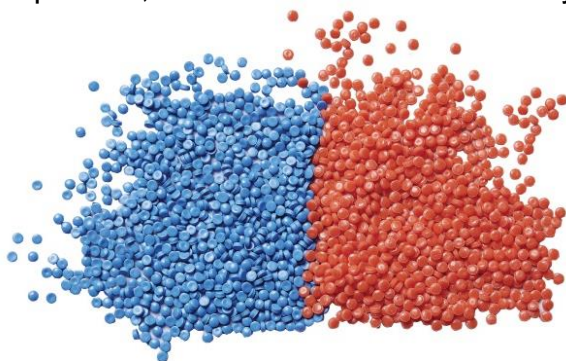
Applications

Some plastics are more problematic to recycle because of high level of contamination, printing on the surface, presence of some pollutants and residual moisture.

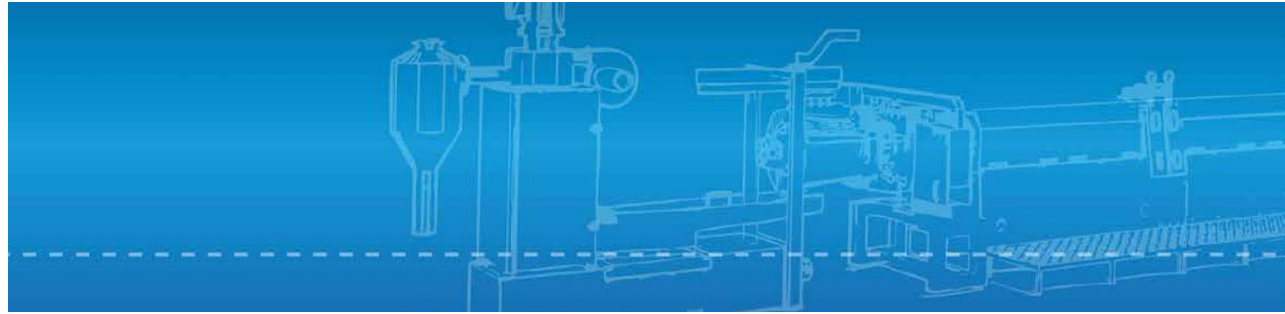
However, the market requests an high quality of the processed materials, independently from the starting material.

The cost-effective and efficient recycling is the big challenge facing the recycling industry.

As a result, there is a growing demand in high quality machinery able to recycle this kind of plastics, like Tandem series offered by Gamma Meccanica.



**HIGH
GRANULES
QUALITY** = \$

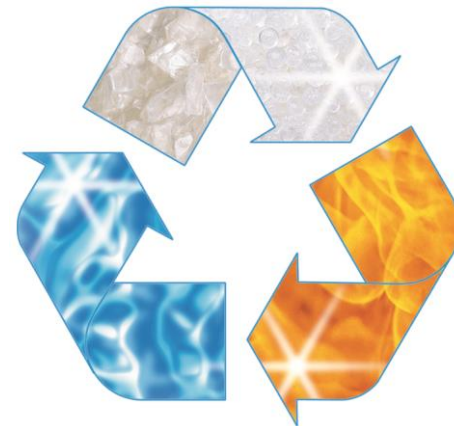


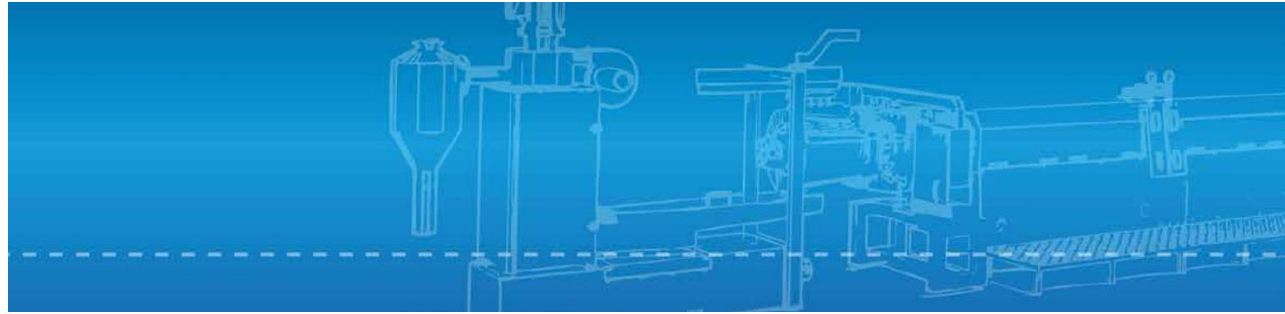
Applications

Gamma Meccanica has developed the Tandem technology to meet the specific needs of regenerators: when they found swollen granules (inclusion of gas) or if the degree of contamination was very high, the only intervention was to "re-extrude" the material with a considerable expenditure of energy that was going to affect the final price of the recycled material.

The re-extrusion of the material involves:

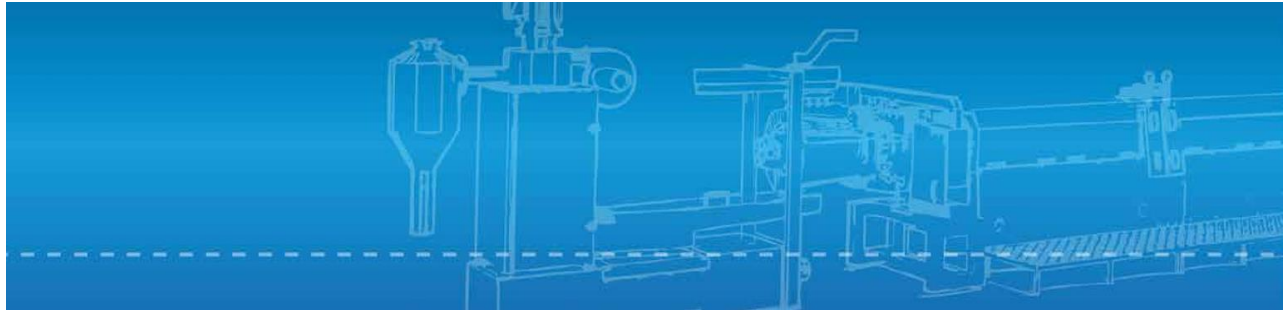
- 1. Increased energy consumption**
- 2. Longer production times, or reduced production**
- 3. Increased cost of the recycled products**



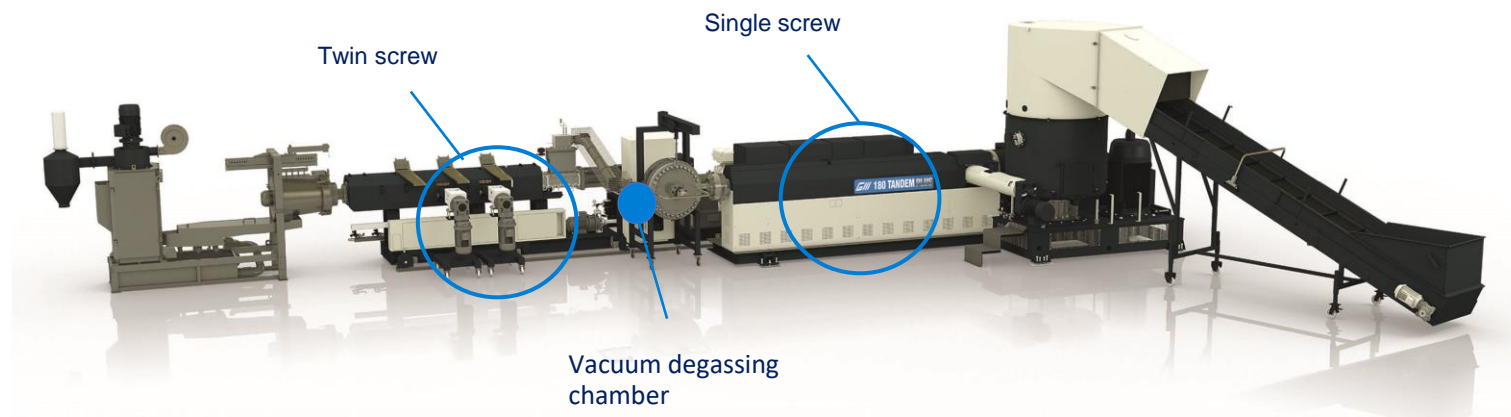


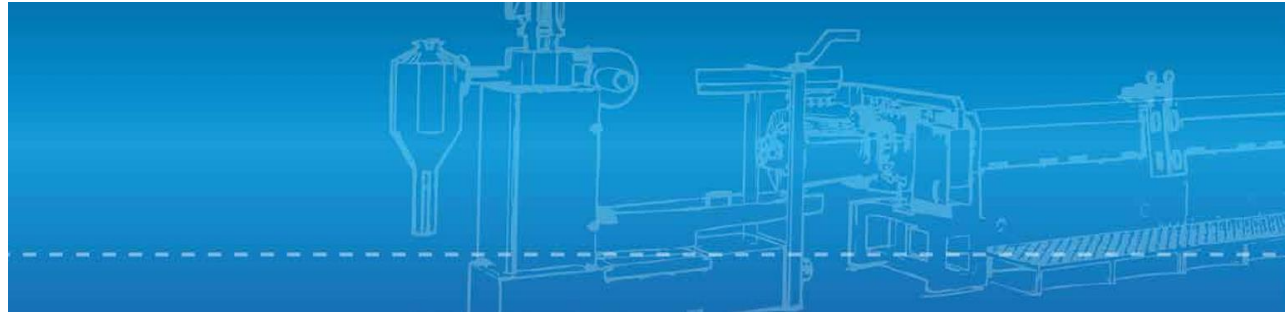
Advantages of Tandem technology

- ◆ Possibility to recycle heavily printed, high humidity and contaminated materials
- ◆ High performance degassing chamber
- ◆ Double filtration for heavily contaminated materials
- ◆ Notable energy savings
- ◆ High quality granules



The ultimate **Tandem PLUS** line allows to have all the advantages of the classic Tandem and the possibility to improve the characteristics of material during the **upcycling** process.



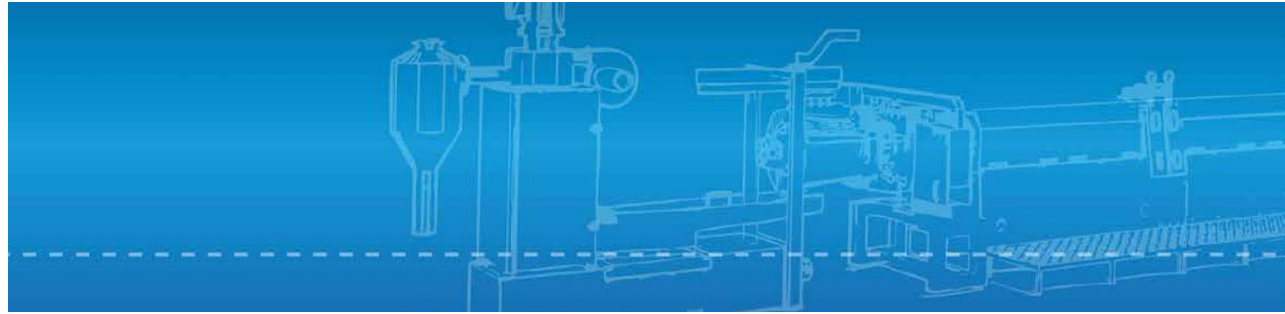


This solution is ideal for the production of compounds for special applications. The Tandem PLUS line provides the combination of the first extruder as a single screw and the second a twin screw.

Distinctive characteristics:

- Line suitable for the recycling for heavily printed high humidity and contaminated materials;
- High performance degassing chamber for removal of up to **10 times** more gas and humidity in the melted material compared to other systems;
- Possibility to have double filtration;
- The first extruder as a **single screw** and the second a **twin screw**.





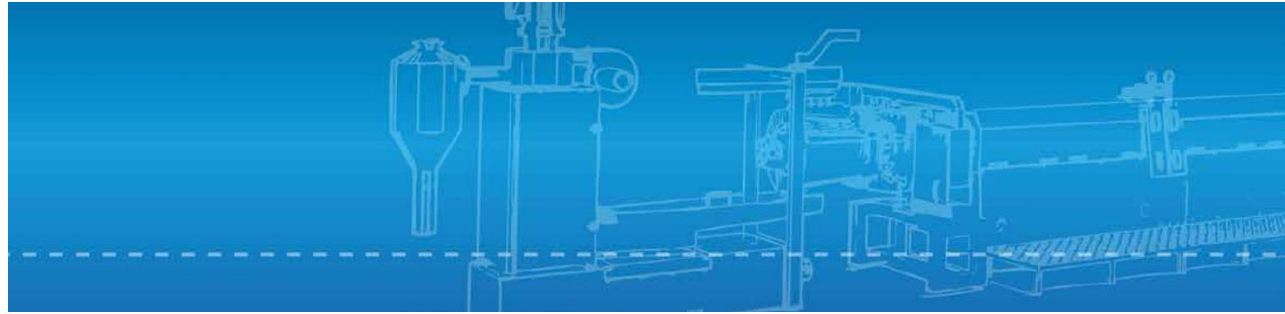
Case History GM180 Tandem PLUS

(to recycle heavily printed and contaminated post-consumer PE waste)

This GM180 Tandem PLUS is the result of increasingly advanced research by the technical staff of Gamma Meccanica and the collaboration of selected partners in the industry. The regeneration and "upcycling" process begins with gravimetric dosing systems to feed the materials to the COMPAC® unit which has the function of shredding and densifying the waste material to be recycled. From the COMPAC® unit, the material is pushed with constant flow from the feeding screw into the first extruder.

Connected to the first extruder there is a self-cleaning screen changer, installed to remove the contaminants. At the exit of the screen changer, the melt is "degassed" by the high performance vacuum chamber that allows for removal of up to 10 times more gas and humidity in the melted material compared to other systems. The polymer is "enriched" with masterbatch, calcium carbonate and various other additives inside the twin-screw extruder. The upcycling process ends with the cutting of the melted material inside the TDA, our water ring pelletizer.





Materials recycled with GM180 Tandem PLUS



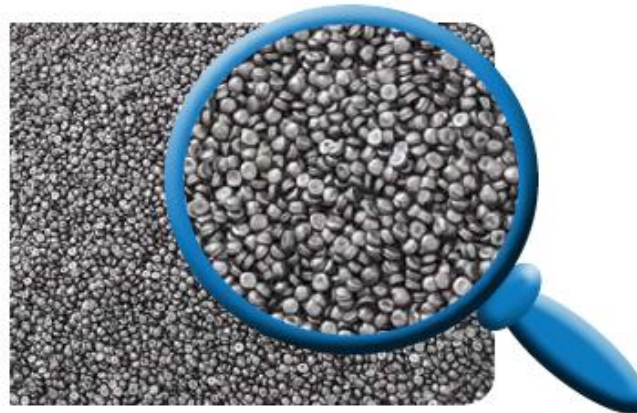
Additives :

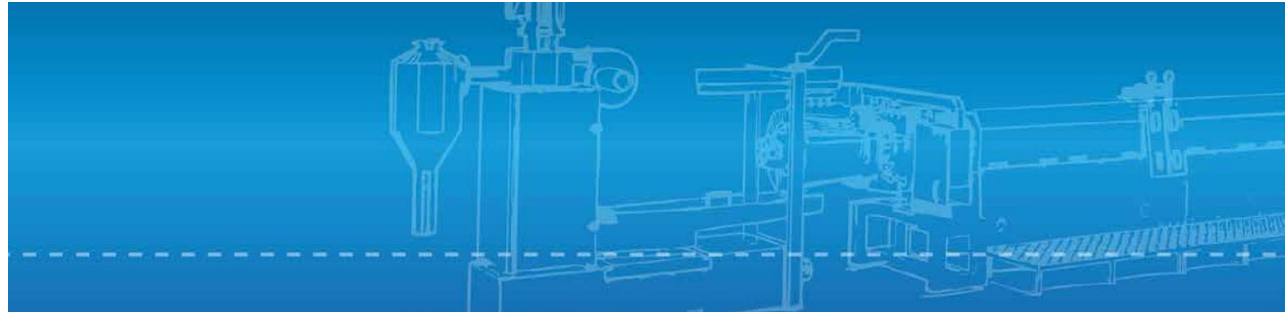
CaCO₃
Colour

HDPE

HMWPE

LDPE



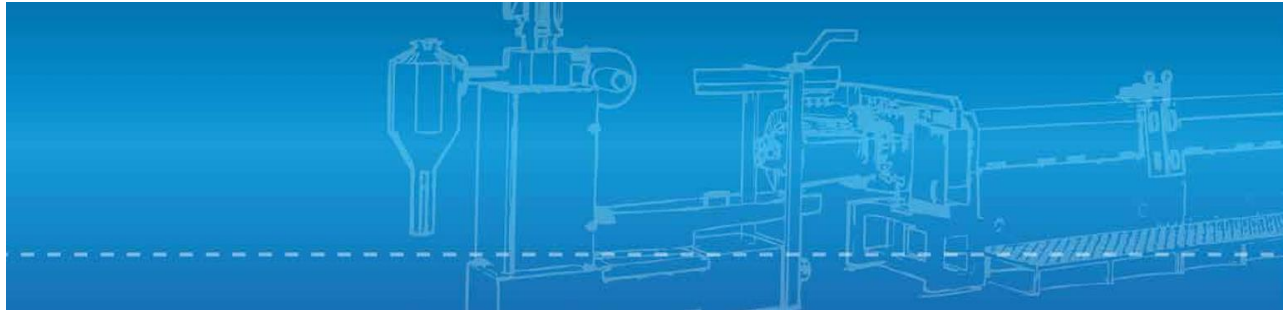


Gravimetric dosing systems,

With dosers for ground and soft material

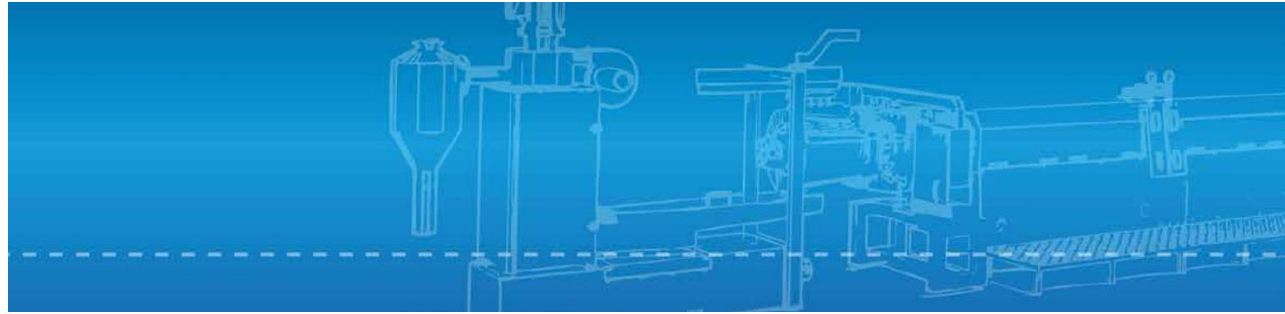
Belt conveyor to feed directly the compac unit with bulk material



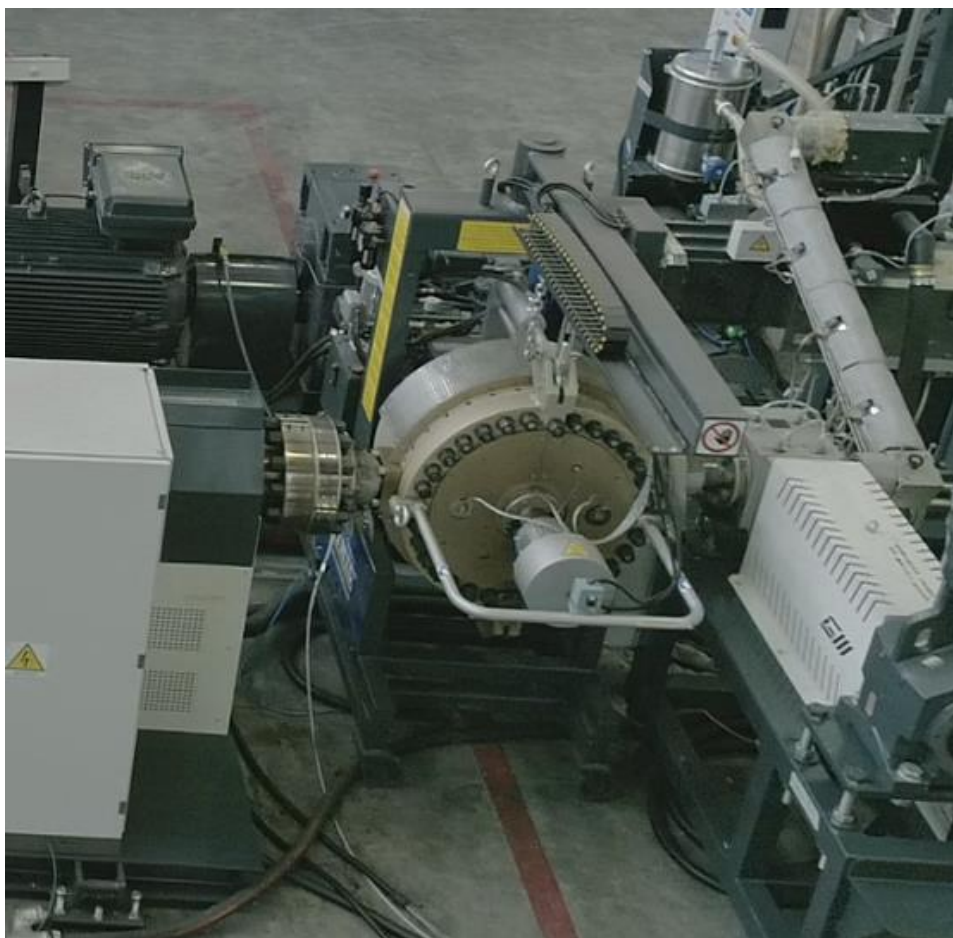
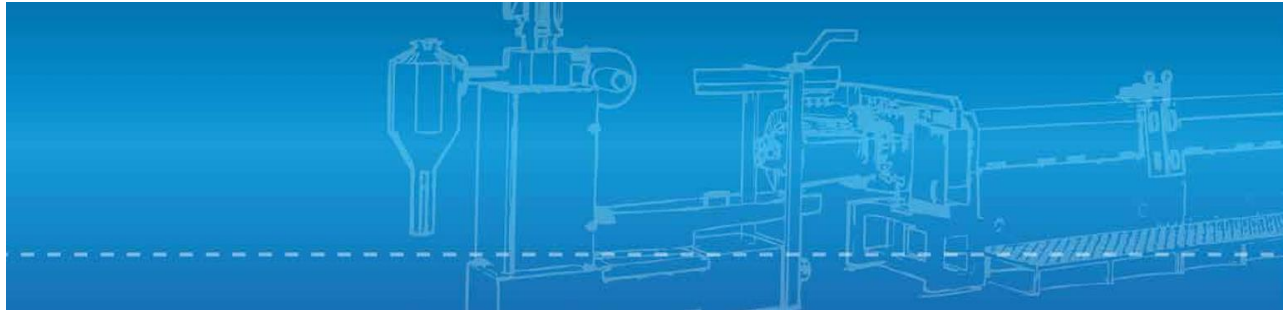


Compac system

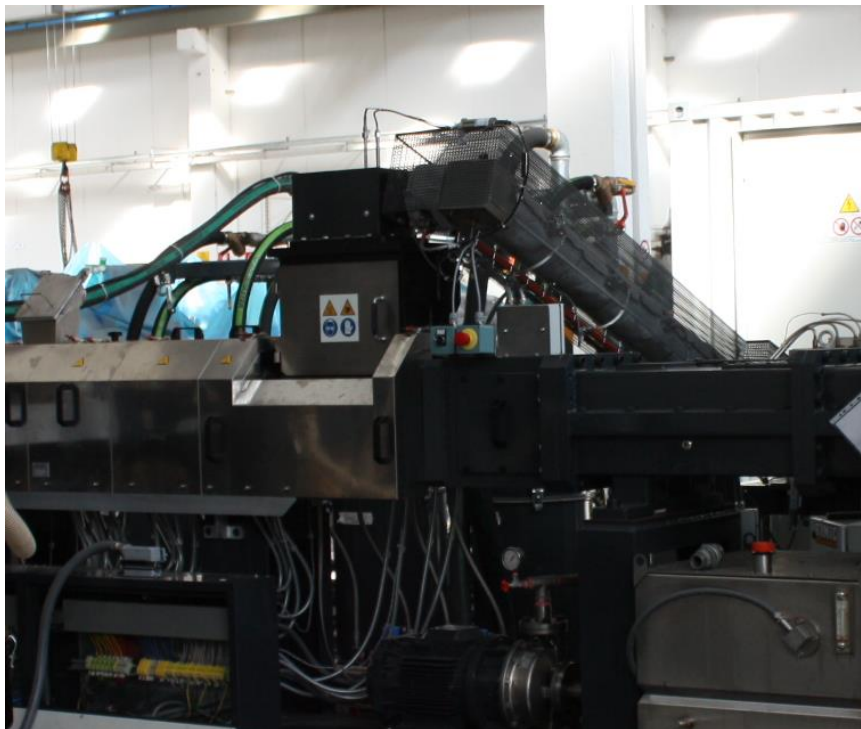
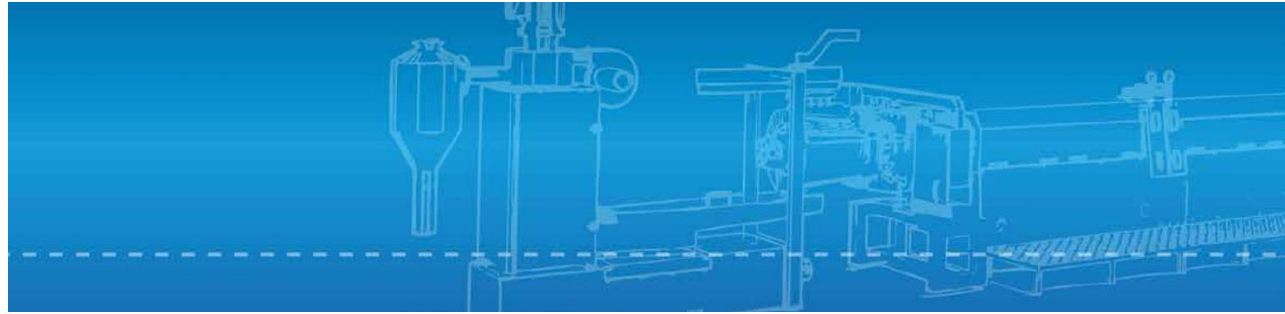




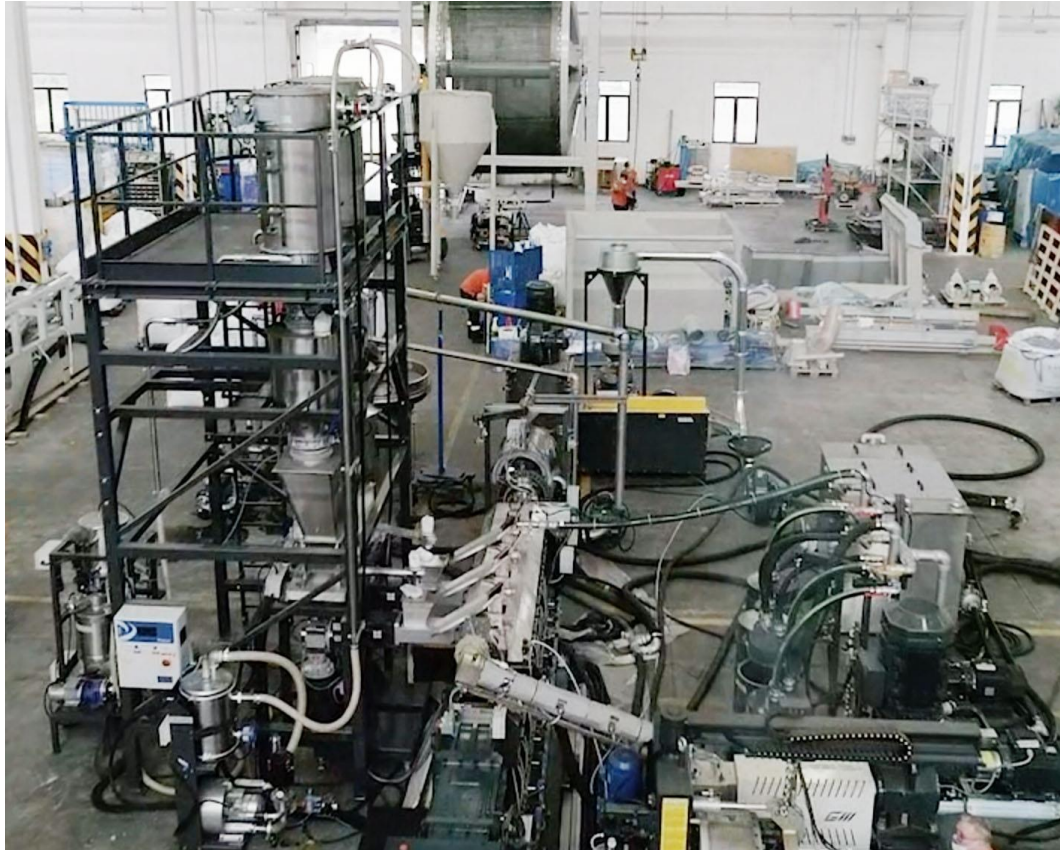
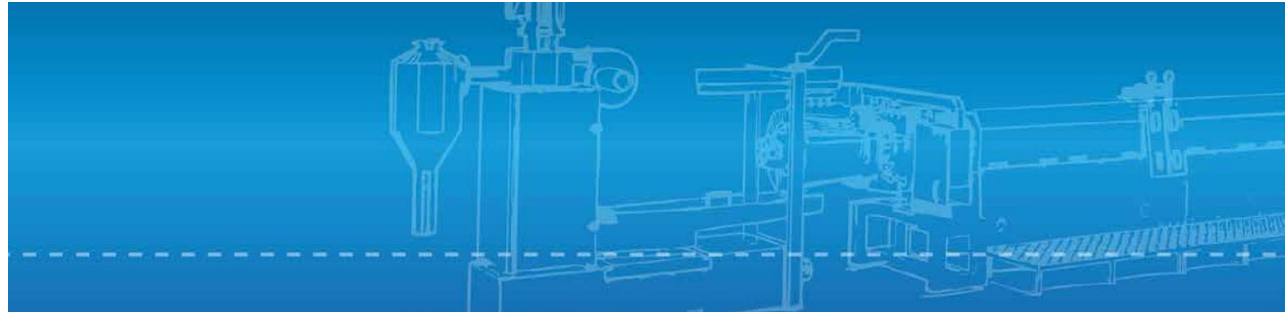
**First single
screw extruder**



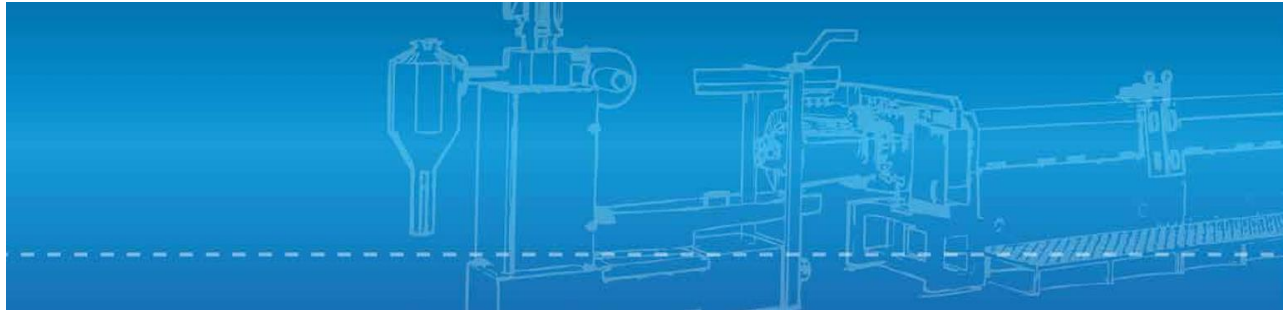
Screen changer



**Vacuum
degassing
chamber 10x**

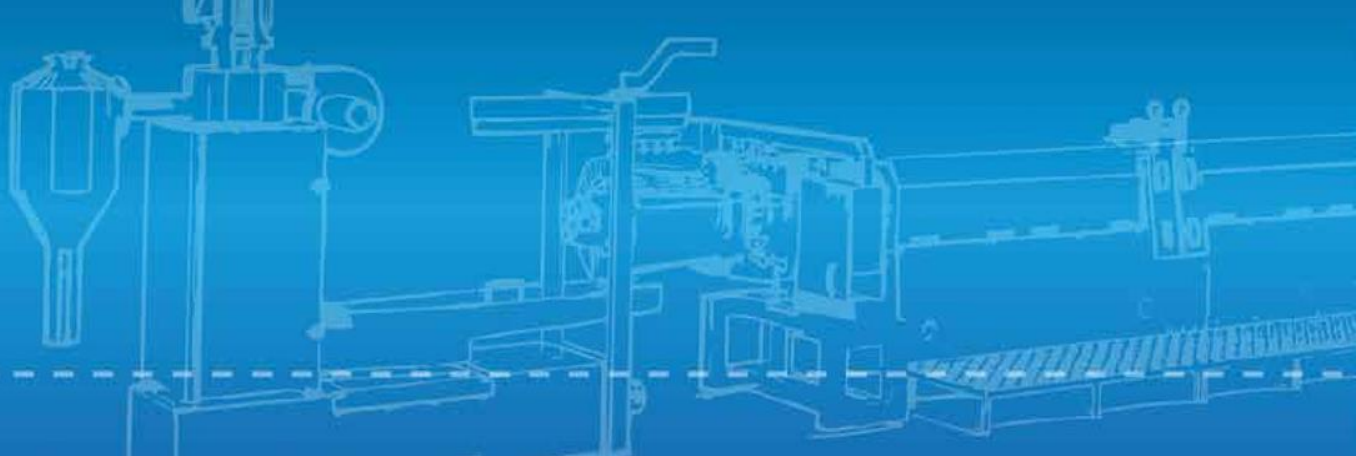


**Second twin
screw extruder
with dosing
system for
master,
carbonate and
various
additives**



**Water
ring
pelletizer
TDA**





TANDEM PLUS

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