Innovative Flat Die PET Film Extrusion Lines
Costruzioni Meccaniche Luigi Bandera S.p.A. is a worldwide leader in the design and manufacture of complete extrusion lines for packaging and converting.

Bandera history

1943 the first extruder was manufactured in Luigi Bandera’s first workshop

1947 Costruzioni Meccaniche Luigi Bandera officially started operating

1950 Bandera was converted into a joint stock company

1960/70 between 1960 and 1970 company business expanded to an industrial scale

1980/90 through the 1980s and 1990s the company became an acknowledged leader among the extrusion equipment manufacturers

now Bandera, currently managed by Franco and Piero, the founder’s sons, has recently focused its product range on two main technologies:

• Flat Die extrusion technology for the production of rigid thin films and thick sheets

• Blown Film extrusion technology for packaging/converting/agrifilm
The way we are

Honesty, directness and respect are the main ingredients of our everyday life. Our founder, Luigi Bandera, used to say that the essential asset held by his company is the people and their value.

This powerful thought drives us in our daily approach to business and innovation.

Our mission, Extruding Future Plastics Now®

Bandera’s mission is to establish itself as the most important extrusion centre in Europe and to strengthen its role as a main global player.

Bandera’s pioneering approach in manufacturing production lines for plastic materials in the Blown Film and Rigid Film and Sheet sectors, featuring state-of-the-art technology, will make it the forerunner of future extrusion.

Top numbers

Our numbers sum up concisely the real meaning of our long term expertise, our know-how and innovative approach.

We are an international company but remain firmly rooted in the Made in Italy tradition. We develop and manufacture unique, customised solutions, to meet specific customer requirements, supporting them from engineering up to installation and after-sales services.

25 500
days of experience in extrusion

15 500
active clients worldwide

35 000
extruders installed running worldwide

100%
In-house design and manufacturing

We listen, don’t just hear
We watch, don’t just see
We create, don’t just make
The concept of **Extrusion Intelligence** is the essence of Bandera’s continuous innovative ideas in extrusion technology.

As a globally recognised brand, Bandera is a synonym for technological innovation in extrusion, supplies reliable and cost-efficient solutions and equipment, as well as engineering services, know-how and turnkey installations.

Bandera is capable of gathering its expertise, ideas and innovation from many sources, in order to compete in an environment of increasingly complex technology, to find the best solution for each application.

**The House of Extrusion**

Bandera created the most innovative European extrusion centre for packaging and converting. **The House of Extrusion** is a sign of Bandera’s vision. Jointly with customers, industry, academia and research centres, Bandera opens the doors the creation of new solutions to anticipate market demand.
Since the 2000s, Bandera has developed and improved a cutting edge extrusion system for the production of PET Rigid Film and Sheet from both virgin material and recycled PET. Up to the present, this unique Bandera co-rotating twin-screw technology has been applied to more than 150 extrusion lines for the production of high quality PET Rigid Film and Sheet. The Bandera extrusion line achievable throughput exceeds 2.5 t per hour. Raw material standard composition - for the twin-screw “core” layer - is 100% recycled PET flakes from post-consumer PET bottles and/or PET skeleton waste from thermoforming and/or PET regrind from bottle pre-forms. Bandera customers usually include some virgin PET material as external capping layers (functional barrier: up to 7.5% each layer) to obtain the classic A-B-A structure.

Bandera innovation: a synonym for excellence

Bandera is a worldwide leader the design and manufacture of top performance Flat Die PET extrusion lines

Deep extrusion knowledge™

In-house design and production

Guaranteed line performances

Full satisfaction of customer requirements

Competitive and cost-effective

Reliable and robust equipment

Experienced & Innovative

Flexibility in project engineering

Future-oriented

Serious and well-organised

Top-level performances
Bandera designs and manufactures complete extrusion lines for the production of **mono and multilayer foil mainly for the food packaging industry** and for the production of rigid films for **industrial thermoforming application**.

**Bandera is a worldwide leader** for the supply of twin screw extrusion systems for the production of PET rigid films, obtained by direct process, avoiding the raw material pre-treatments typically required by conventional technologies.

These patented extrusion systems, combined with the high-tech downstream supply, ensure the following features:

- High output range (up to 2.5 t/h)
- Wide film production (up to 2 m net)
- Increased thickness range (0.12 to 2 mm)
- In-line mass addition of masterbatches and mineral fillers for composite sheets by using **co-rotating twin-screw extruders** combined with innovative and high-precision "loss-in weight" raw material dosing units
- High speed, multi-reel, completely **automatic winding units** for Rigid Film and Sheet lines
- Customised lamination system for PET-PE products destined to the FFS (Form/Fill & Seal) market
Twin screw technology, the ground-breaking concept for PET processing

During the late 90's, owing to the very limited results obtainable with single screw extruders, the Bandera R&D Dept. focused its attention on the **co-rotating highly vented twin-screw extrusion HVTSE® technology**, specially designed for the direct production of PET Rigid Film and Sheet. Renowned among the world leading twin-screw extruder producers, Bandera manufactured a dedicated PET processing machine, which was ready for testing within a few weeks...

Results proved to be encouraging for both Bandera and its customers, from the very beginning. By the end of 1999, the first PET sheet extrusion line was successfully installed in Southern Italy (it featured a double, co-rotating twin screw extruder configuration).

**Bandera technology was promptly patented**, at this stage.

Since then Bandera has kept on developing this technology. Outstanding results in terms of process flexibility, melt purification and cost-effectiveness have been obtained. Bandera constantly supplies lines and equipment for the packaging market to the major players operating in the food packaging industry.
Twin-screw technology main advantages: recycled raw materials and highly polluted industrial scraps

- Possibility to process 100% PET flakes and/or regrind (thermoforming skeleton waste) material with initial humidity up to 1.5% (residual moisture) with no need for dehumidifying process. Raw material pre-treatments are space engaging, possibly expensive and time-wasting.

- User-friendly feeding and dosing equipment
  Dosing systems designed by Bandera are outstanding for reliability, user friendliness, and maintenance-free construction, resulting in easier management and configuration of raw material feeding and dosing ancillary equipment.

- Co-rotating screws featuring a special profile to process PET polymers gently and thus achieve an excellent melt Control, avoiding thermic and hydrolytic degradation.
Twin-screw technology main advantages: the energy saving concept

Power savings: power consumption up to ~35% lower than conventional technologies.

According to the data provided by several converters, the Bandera HVTSE® technology is definitely more efficient, robust and cheaper to run compared to alternative, conventional, technologies available in the market.

These performances are achieved through the use of the co-rotating twin screw extruder, which allows for the processing of PET polymers with no thermic stress and no pre-treatments.

The length of the extruder (42:1 L/D or 52:1 L/D) permits to run a lower velocity process causing no material stress.

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**Twin-screw technology main advantages:**

- **Recycled raw materials and highly polluted industrial scraps**
- **Energy saving concept**
- **Single-screw extrusion + crystallization & dehumidification (no degassing)**
- **Single-screw extrusion + degassing & fast drying**
- **Single-screw extrusion + degassing unit**
- **Co-rotating twin-screw extrusion (no dehumidification)**
Mission: safety, energy savings, recycling

Bandera focuses on two core aspects:

- Extrusion line operation under safety conditions
- Maximized energy efficiency and sensibility to the usage of recycled plastics

In order to provide its customers with:

- **Safe** and reliable **production lines** delivering top manufacturing and quality performances
- Production lines designed for **minimum power consumption**
- Dedicated extrusion lines for the production of finished products made from innovative thermoplastics, favoring **the transformation of recycled and biodegradable materials**

HVTSE® extruder

Bandera customised multilayer PET Rigid Film and Sheet extrusion line
Twin-screw technology main advantages: **maximum flexibility**

- **Maximum flexibility in extruding alternative thermoplastic materials (PLA - PS - PP) for the packaging sector.** No screw replacement required, with excellent output levels if compared to those obtained from single screw extrusion technology and twin screw extruders by other manufacturers.

- **Recipe & colour changeover with no line stop.** Material recipes, formulations and colour changeover are largely eased by the Bandera extrusion process (no line shutdown is required), featuring minimised material residence time and self-cleaning properties of the co-rotating twin screw extruder, which typically allow operation cycle completion in 5÷10 min, **producing significant savings in line running time**, in material consumption and in waste production.

- The extrusion screws consist of mixing and conveying modules assembled on broached shafts. Barrel construction is modular type, consisting of nitrided steel sections.

- **Compact equipment** leading to logistic and infra-structure cost reduction, **thanks to its reduced volume.**

- A team of highly experienced engineers and skilled technicians in the Bandera Technical and Engineering Department allow Bandera to offer customised extrusion lines

- **Higher line output (400 ÷ 2500 kg/h).**
High vacuum venting systems with boosted vacuum pumps - 10÷15 mbar residual vacuum - are reliable, have very low maintenance requirements and allow a very high melt purification with easy extraction of unwanted volatile materials, interstitial gas, residual moisture, oligomers, aldehydes and any carbonious materials.

Bandera has been a trendsetter, among extrusion machinery manufacturers, in starting such experimentation trials several years ago, as a result of which Bandera achieved its FDA NOL in 2009.

The unique combination of screw profile, extruder length and vacuum system is the core of Bandera R&D efforts. The minimised IV drop in no way interferes with sheet mechanical properties. Melt control in the extrusion die is much easier due to its consistency characteristics. The result is a superior finished product quality.
TECHNICAL DATA

**Line Type**  
3-layer CoEx-Sheet-Line plus lamination - high production

**Dosing Unit**  
Loss in weight dosing unit

**Extruders**  
Co-rotating twin screw with very long, high vacuum venting unit; TR90 35D single screw with high wear resistant steel, 90 mm barrel, air cooled and grooved feeding zones, barrier screws

**Extrusion die**  
3-layer flat-die with deckles and feed block

**Calender**  
3 rolls horizontal cooling & polishing roll stack calender; integrated lamination or extrusion coating unit available on request

**Thickness control**  
Control by air cushion sensor

**Haul Off**  
With silicone coating device and dryer are combined in one single frame

**Accumulator**  
Double rack with 40m stock capacity, to slow down line speed during reel changing operations

**Winding**  
Automatic Revolver Type, Multi-reel winder;

**Line Control**  
Touchscreen, with IoE Internet of Extrusion® - Bandera Smart Factory solution proprietary software

**Teleservice**  
Digital modem

**Note**  
More options and customised solutions are available on demand

Typical applications
General packaging, food packaging, thermoforming or similar applications.

**RAW MATERIALS**
Regrind or virgin PET (APET-CPET-GPET-EPET), PP, PS, PLA or further resins

<table>
<thead>
<tr>
<th>Film width</th>
<th>Up to 2000 mm net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film thickness</td>
<td>120 ÷ 2000 µm</td>
</tr>
<tr>
<td>Output capacity</td>
<td>Max 2500 kg/h</td>
</tr>
</tbody>
</table>
Multilayer PET/PP/PS rigid film extrusion line

TECHNICAL DATA

Line Type 3-layer CoEx-Sheet-Line plus lamination
Dosing Unit Loss in weight dosing unit
Extruders Co-rotating twin screw with high vacuum venting unit;
Single screw, air cooled and highly vented
Extrusion Die 3-layer flat die with internal decklers
Calender 3 rolls, horizontal cooling & polishing roll stack calender; Integrated lamination or extrusion coating unit available on request
Thickness control Control by air cushion sensor
Haul Off With silicone coating device and dryer combined in one single frame
Accumulator Double rack to slow down line speed during reel changing operations
Winding Semi automatic 2-station cantilever winder with drive management by PLC;
Max reel diameter 1200 mm
Line Control Touchscreen, with IoE Internet of Extrusion® - Bandera Smart Factory solution proprietary software
Teleservice Digital modem
Note More options and customised solutions are available on demand

Dimensions

<table>
<thead>
<tr>
<th>Length</th>
<th>35000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>9000 mm</td>
</tr>
<tr>
<td>Height</td>
<td>6000 mm</td>
</tr>
</tbody>
</table>

Typical applications

General packaging, food packaging, thermoforming or similar applications.

RAW MATERIALS

Regrind or virgin PET (APET-CPET-GPET-EPET), PP, PS, PLA or further resins

<table>
<thead>
<tr>
<th>Film width</th>
<th>Up to 1450 mm net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film thickness</td>
<td>120 ÷ 1500 µm</td>
</tr>
<tr>
<td>Output capacity</td>
<td>Max 1300 kg/h</td>
</tr>
</tbody>
</table>

Innovative complete multi-layer PET film extrusion line for rigid and thermoformed food packaging, for very high output

- Fully equipped with top quality accessories
- Excellent thickness tolerances
- Specialised for standard top quality PET films
- Available also for TDO label films and special furniture films
- Dedicated also to new applications for PET thin films in the credit card film sector
SMARTDUTY®

Innovative and cost effective PET, PP and PS rigid film extrusion line
new series “SmartDuty® 2020”

TECHNICAL DATA

Line Type 3-layer CoEx-Sheet-Line
Dosing Unit “Loss-in-weight” dosing unit
Extruders Co-rotating twin screw extruder with high vacuum venting unit or as an alternative single screw extruder (PP/PS)
Co-Ex Single screw
Filter Hydraulic continuous
Thickness Control by air cushion sensor
Extrusion Die 3-layer feed-block box plus flat die with deckers
Calender 3 rolls horizontal cooling & polishing roll stack calender with large middle rolls
Haul Off With silicone coating device and dryer combined in one single frame
Foil accumulator Double rack with stock capacity, to slow down line speed during reel changing operations
Winding 2-station cantilever winder, manual foil cutting and threading, or IN-LINE configuration to direct feed the thermoforming machine
Line Control Touchscreen, with IoE Internet of Extrusion® - Bandera Smart Factory solution proprietary software
Teleservice Digital modem

Note More options and customised solutions are available on demand

Typical applications General packaging foil, food packaging foil, thermoforming foil or similar applications.

RAW MATERIALS
Regrind or virgin PET (APET-CPET-GPET-EPET), PP, PS, PLA or further resins

<table>
<thead>
<tr>
<th>Film width</th>
<th>Up to 1300 mm net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film thickness</td>
<td>180 - 1200 μm</td>
</tr>
<tr>
<td>Output capacity</td>
<td>Max 1000 kg/h</td>
</tr>
</tbody>
</table>
Cost effective innovative multi-layer PET/PP or PS/PP complete sheet extrusion line for the production of rigid thermoformed packaging (IN-LINE version available)

- Dedicated to thermoforming application (IN-LINE configuration)
- Available for a wide thickness range
- Limited floor space requirement
- Very competitive price
- Maximum flexibility on raw materials
- Available also for medium/small outputs
- Extrusion section with main co-rotating twin screw extruder or single screw extruder
Rigid film lines for converting application

Agility Line Series

TECHNICAL DATA

**Line Type** 3-layer CoEx-Sheet-Line plus lamination

**Dosing Unit** Loss in weight dosing unit

**Extruders** Co-rotating twin screw with high vacuum venting unit

Single screw air cooled

**Extrusion Die** 3-layer flat die with internal deckles

**Calender** 3 rolls horizontal cooling & polishing roll stack calender

**Thickness** Control by air cushion sensor

**Winding** 2-station automatic revolver winder with drive management by PLC, automatic foil cutting and threading, reel diameter max 800 mm

**Line Control** Touchscreen, with IoE Internet of Extrusio™ - Bandera Smart Factory solution proprietary software

**Teleservice** Digital modem

Typical applications

Form, fill & seal, converting plus food and thermoforming applications.

### RAW MATERIALS

Recycled or virgin PET (APET-CPET-GPET), PP, PS, PLA or further resins

<table>
<thead>
<tr>
<th>RAW MATERIALS</th>
<th>Dimensions</th>
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</thead>
<tbody>
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<td>Film width</td>
<td>Length 12000 mm</td>
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<tr>
<td>Film thickness</td>
<td>Width 9000 mm</td>
</tr>
<tr>
<td>Output capacity</td>
<td>Height 5000 mm</td>
</tr>
</tbody>
</table>

Innovative complete multi-layer PET film extrusion line for rigid and thermoformed food packaging for high output

- Fully automatic operation including PE film lamination process
- Complete with raw material feeding equipment and automatic winding unit even in limited floor space conditions
- Complete production platform with “plug & play” modular installation
- Dedicated to short production campaigns with limited scraps
New packaging solutions: lamination process

**IN-LINE PET LAMINATION SYSTEM WITH PRESSURE ROLL**

**IN-LINE LAMINATION WITH POLYETHYLENE FILM**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>PET FOIL</td>
</tr>
<tr>
<td>B</td>
<td>100% RECYCLED PET</td>
</tr>
<tr>
<td></td>
<td>(LAYER B)</td>
</tr>
<tr>
<td></td>
<td>VIRGIN MATERIAL</td>
</tr>
<tr>
<td></td>
<td>(LAYER A)</td>
</tr>
<tr>
<td>A</td>
<td>TIE RESINS</td>
</tr>
<tr>
<td>B</td>
<td>PE</td>
</tr>
<tr>
<td>A</td>
<td>LAMINATION FILM</td>
</tr>
</tbody>
</table>

**OFF CALANDER LAMINATION**

**OFF CALANDER LAMINATION WITH EVOH BARRIER FILM**

<table>
<thead>
<tr>
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<tr>
<td>A</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>(LAYER A)</td>
</tr>
<tr>
<td>A</td>
<td>TIE RESINS</td>
</tr>
<tr>
<td>B</td>
<td>EVOH</td>
</tr>
<tr>
<td>A</td>
<td>TIE RESINS</td>
</tr>
<tr>
<td>A</td>
<td>LAMINATION FILM</td>
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</tbody>
</table>

Final products / main applications for PET + PE (Barrier) foil - some examples
New packaging solutions: In-line extrusion coating

**IN-LINE COATING TECHNOLOGY**

The **IN-LINE coating** system allows the user to have full flexibility in terms of raw material choice and management, which produces a large potential reduction of production costs, compared to standard multi-layer film technology.

Standard PET foil - usually featuring A-B-A structure - is afterwards (slightly) pre-heated and coated with barrier layers (EVOH and tie resin) and/or PE layers.

All resins are processed through small single screw extruders mounted on a dedicated support frame. Coating is performed by an automatic multi-manifold flat extrusion die and a special design chill roll equipment.

**The adhesion between PET and PE barrier layers is extremely high** - in all probability the best on the market. The IN-LINE coating system has further widened Bandera expertise in this field, becoming one of Bandera’s flagships.

Bandera technology can be applied to PP and PS sheet and retrofitted to existing extrusion lines.

Customised and innovative structures are available on request.
The ultimate innovative solutions: lowering package weight

STRUCTURAL FOAM PET SHEET TECHNOLOGY PATENTED

Bandera has recently focused on the foam PET sheet field through the use of its ultimate co-rotating twin screw extruder (52:1 L/D). Current foam PET sheet is produced by processing virgin PET with foaming agents. Since the latter agents are very expensive, production costs are high. Furthermore, final products have proved to be almost un-recyclable and inefficient cost wise.

Bandera has based its latest research on physical foaming (i.e. by gas injection) using recycled PET flakes (from post-consumer and industrial waste). The advantages of this process are significant cost savings on raw materials and the total recyclability of the product.

AMAZING FLEXIBILITY

A standard Bandera PET Rigid Film extrusion line can be versatiliy converted to foam PET sheet production by adding an appropriate gas injection system and process adjuvants. (The special universal design of the twin extrusion screws is suitable for both rigid and foam PET production). To obtain a superior quality foam PET sheet, Bandera is capable of supplying dedicated extrusion equipment to optimize the whole extrusion process. The same principle can be developed by using alternative resins such as PLA, PS,...

NEW CONCEPT: FROM 1 TO 5 LAYERS STRUCTURAL FOAMED SHEET (VELPET)
E-PET film

The results obtained by Bandera R&D are both interesting and encouraging. Typical PET density is $1.33 \div 1.35$ kg/dm$^3$. In case of ABA or BBB structure (B layer being 100% Post Consumer Waste - mixed with industrial skeleton waste) weight reduction values are the following:

- **Total sheet thickness**: 0.30 $\div$ 1.40 mm
- **Density achieved**: 0.50 $\div$ 1.15 kg/dm$^3$

Weight reduction rate strongly depends on the final application. Significant production cost savings have been achieved by replacing rigid box liners with foam liners. Bandera has once again confirmed its trendsetting attitude - the development of new products is combined with cost savings and environment friendly, commitment focused on turning plastic materials into eco-friendly lower weight packaging, in high demand by both food and non-food markets.
Lighter Packaging

The crucial innovation challenge for Bandera is to replacing standard raw materials to produce more packaging products in recyclable PET, using new ABA structure to ensure best surface quality.

For this reason Bandera has launched the Lighter Packaging® campaign.

Do you want to lower package weight?
Ask Bandera

• Usage of post-consumer recycled PET flakes both for rigid and foam layers
• Lower total sheet weight and equally real lower weight of thermoformed items, with mechanical properties similar to those of compact sheet
• Production scraps available to be re-processed with the possibility of using skeleton waste
• Possibility to switch from rigid PS to foam PET or from rigid PET to foam PET very easily
• Very good surface roughness (thick layers of rigid material on outer sides)
• 5 layer CBABC rigid film configuration available for usage as functional barrier
• Minimum thickness increase
Advantages of Bandera as technological partner in flat die technology

Over recent months, Bandera has managed to strengthen its leading market position in the packaging sector worldwide - the supply of several A-PET, C-PET, PET-G, PP, PS and PLA sheet extrusion lines has ranked the renowned Italian company among the major extrusion machinery manufacturers. Several Bandera customers are the major suppliers of packaging products to the most important food industries worldwide. Bandera stands out for the following advantages:

- **Great expertise in running complete extrusion lines** featuring 120 ÷150 µm minimum thickness
- **Possibility to combine single screw** extruders to simple degassing systems, to produce A-B-A configuration external layers (no need for dehumidification)
- **Great number of references worldwide** (major converting companies)
- **Special experience in PE and PE/tie/EVOH** (In-line processes for film lamination and extrusion coating)
- **Use of automatic extrusion dies** with exceptional performances in terms of sheet planarity
- **Great experience** in providing automated multi-reel winders (2, 3 or 4 reels on the same shaft)
- **Wide experience in integrating ancillary equipment** (including global line supervision by PC up to raw material handling and conveying)
- **Accredited sub-suppliers/vendors** for special electronic components supported by dedicated service
- **Experienced and prompt customer care**, supported by training and after sales service (prompt reaction to customers’ needs - live emergency service and teleservice)

Thanks to its expertise and engineering skills, Bandera provides full and prompt technical support for revamping, upgrading and refurbishment projects. Bandera’s offer range includes special equipment such as “drilled” designed calender rolls, extrusion screws, barrels and single components, flat extrusion dies and relevant accessories, several downstream ancillary equipment obtained - from specific proprietary design and manufacturing process (either standard or customised as per individual requirements).
The OEEE-Overall Extrusion Equipment Effectiveness - index has originally been applied to Lean Production System. The Bandera OEEE has now been adapted to extrusion for film production working on 3 key concepts:

- The availability index is the parameter for line exploitation with respect to the overall available time, which gives the line **EFFECTIVE OPERATING TIME**, i.e. machine running time.
- The efficiency index which is the parameter for line output performance. During its operating time, the line should produce a given quantity of product (effective product + scraps, in kg) according to machine rated output.
- The quality index, which is the parameter for line production quality is given by the quotient of the scrap quantity (in kg) multiplied by the total production quantity (in kg).

Such indexes are aimed at enhancing maintenance efficiency to minimize downtimes due to line operating failures through operating or maintenance instructions accompanied by diagrams and illustrations called One Point Lessons.

**A responsive and efficient Customer Service**

- **6 after-sales service centres** for a worldwide assistance
- **Over 24 months warranty** upon request
- **Top class on-site technicians** specialised in installation and start-up
- **Customised specific training** for new applications
- **Scheduled technical servicing** for extraordinary maintenance
- **Cost effective spare parts packages**
- **Reclaiming** of existing machines and **revamping** of complete extrusion lines
- **Cognitive Extrusion®** with IoE Internet of Extrusion® for continuous intelligent maintenance.
Close to our customers

Headquarters

PET lines sold in the world 2000-2017

Service centres
- Belgium
- Brazil
- China
- Indonesia
- USA

Top loyalty

More than 200 complete PET lines installed worldwide, since 2000, with full customer satisfaction
Bandera developments in North America PET and PLA

From the end of 2010 to the present Bandera assembled several HVTSE® corotating twin-screw extruder at the largest North American processors in the thermoformable PET and PLA rigid film extrusion sector. Downstream line section has been designed and manufactured by PTI Processing Technologies International LLC.

After-sale service is available from PTI headquarters near Chicago.
You and Bandera, within the new markets of PS/PP/PET and PLA rigid and semi-foamed packaging films, will drastically reduce energy consumption, extensively widen the usage of recycled and biodegradable materials, process challenging new applications for lower weight packaging and now, exclusively with Bandera, speed up the Overall Extrusion Equipment Effectiveness® (OEEE), by the specific instruction protocol Bandera Deep Training® to the operating personnel.

Cognitive Extrusion® handles the data, information and knowledge that are produced around the clock by our line sensors, allowing via IoE Internet of Extrusion® the management of planned, preventive and predictive maintenance.