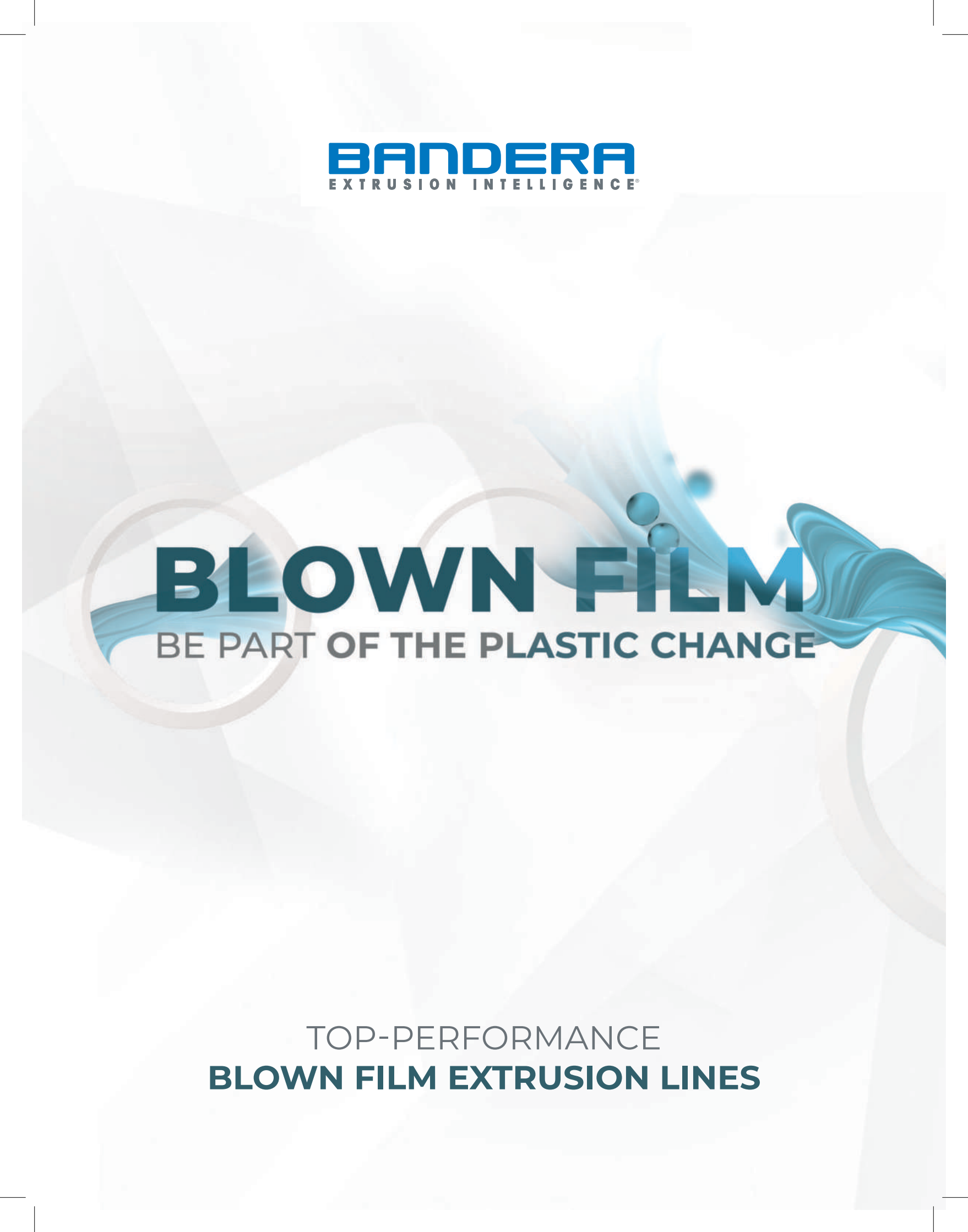




BANDERA
EXTRUSION INTELLIGENCE®

BLOWN FILM

BE PART OF THE PLASTIC CHANGE

TOP-PERFORMANCE
BLOWN 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.

Our history

1947

Luigi Bandera officially established the company and started the history of extrusion in Italy

1950

Costruzioni Meccaniche Luigi Bandera became a joint stock company, scaling up its activities to become an industrial concern

1960/70

Costruzioni Meccaniche Luigi Bandera experienced a remarkable industrial growth developing a wide and diversified range of extrusion products

1980/90

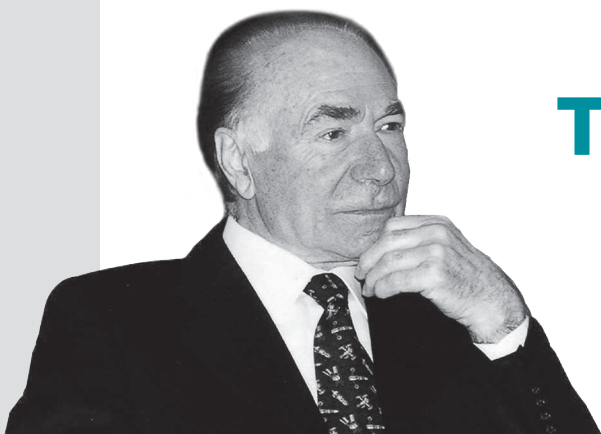
Costruzioni Meccaniche Luigi Bandera was acknowledged as one of the leading companies in the extrusion sector of both Blown Film and Sheet, in Italy and worldwide

2015/2016

Opening of the House of Extrusion®, 6000 m² (64600 ft²) housing R&D and test-running activities on complete production lines

Today

Bandera focuses on **Blown Film** and **Flat Die** extrusion technologies, offering customized engineering services and an after-sales global network





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®**

Establishing Bandera as the most important design and manufacturing centre for extrusion in Europe and a worldwide leader in packaging and converting solutions. Providing production lines featuring state-of-the-art technology for innovative thermoplastic materials.

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.

We listen,
don't just hear
We watch,
don't just see
**We create,
don't just
make**

since 1947

experts in extrusion

16K

active clients all
over the world

35K

extruders installed
running worldwide

**55000 m²
180000 ft²**

production sites

54000 t

of extruded
polymers per day

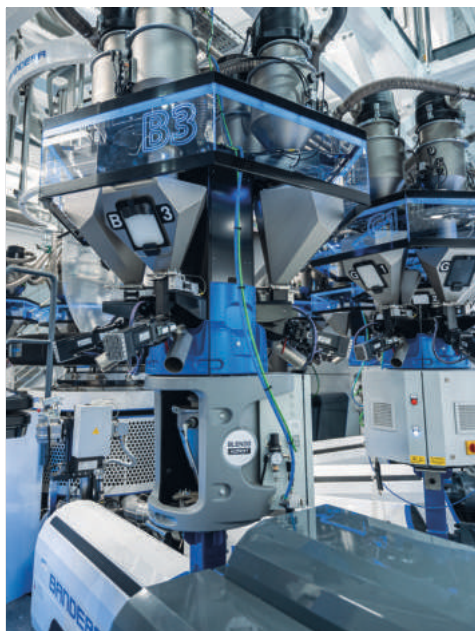
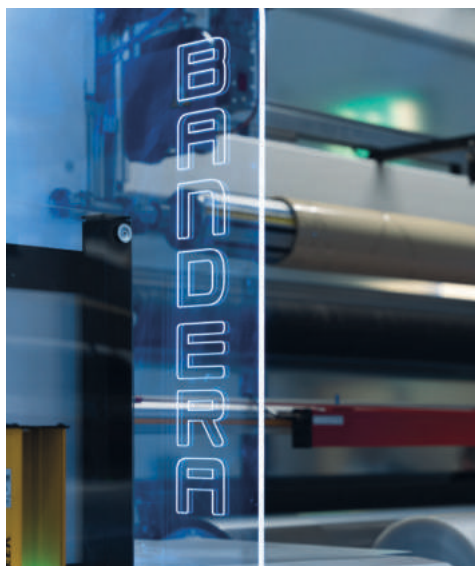
100%

In-house design
and manufacturing





Innovation is a state of mind



El Extrusion Intelligence®

The concept of **El 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.



Bandera **Blown Film** lines production range

Bandera Blown Film extrusion range includes:

- **SmartFlex**® Blown Film lines (1, 3 and 5 layers), characterized by a competitive investment level, maximized flexibility for different applications recipes, power consumption reduction, functional and compact layout featuring frames modularity
- **Techno Flex**® Blown Film lines for the production of multi-layer film (3 and 5 layers) with top performances
- **Barrier Flex**® Blown Film lines for the production of barrier and high-barrier film with symmetrical and asymmetrical film structures (7, 9 and 11 layers)
- **HDBFlex**® Blown Film lines for the production of FFS industrial bags
- **Agri FutureFilm**® Blown Film lines for the production of agricultural film
- **Geo FutureFilm**® Blown Film lines for the production of geomembrane

Bandera innovative know-how and technologies are also applied to cutting edge thermoplastic process for the production of shoppers and bags of different shapes and sizes, as well as shrink film, pallet wrapping and stretch-hood.

Bandera is a
**worldwide
leader the
design and
manufacture of**
top performance
Blown Film lines



SmartFlex® series pursues:

- quality
- flexibility
- reliability
- low power consumption
- low environmental impact



SMARTFLEX[®]*

Blown Film lines, characterized by a competitive investment level, maximized flexibility for different applications/recipes, power consumption reduction, functional and compact layout featuring frames modularity

The achieved cost savings comes from series production, all general costs are split into a large number of lines thus generating an economy of scale at procurement stage.

The SmartFlex[®] series can be configured either in 1, 3 or 5 layers and comprises different versions:

- **SmartFlex[®] Plus:** higher winding quality, given by axial driven mandrel allowing combined winding mode
- **SmartFlex[®] HP:** higher output, given by increased extruders sizing
- **SmartFlex[®] HP Plus:** combining the two above mentioned features
- **SmartFlex[®] HDB:** to combine **SmartFlex[®]** standard products with the production of HDB/FFS films

SmartFlex[®] width range goes from 1200 up to 2600 mm (47 - 102") net.

MAIN ADVANTAGES

- Excellent mid- and long-term yield
- Excellent cost effectiveness
- User-friendly line management
- Made in Italy - Made in Bandera
- Best performances in processing biodegradable and compostable materials

SMARTFLEX[®] SERIES POSSIBLE APPLICATIONS

- Packaging film (food and non-food film)
- Thermo-shrink film
- Lamination film
- Stretch-hood film
- Converting film





TECHNO FLEX^{®*}

Blown Film lines for the production of top performance high-tech multi-layer film (3 and 5 layers)

Undoubtedly, film co-extrusion represents the most consolidated technology for the production of advanced multipurpose packaging solutions.

The standard configuration comprises a central high-capacity extruder, arranged with two smaller ones intended for the outer layers.

Techno Flex^{®*} lines are fully accessorized getting top quality high-tech film through upgraded components. Among them it is worth mentioning the top range winder ESR-9000 series, which allows 3 winding methods: contact, axial and gap. Pushing on strong customization, Bandera extrusion lines are characterized by production need orientation, **top versatility and safety**, combined with minimized power consumption.

Particularly, the 5-layer configuration is perfect for customers looking for high production flexibility to process PE film with very high production (**Techno Flex^{®*} PO⁵**), allowing them to produce technical film with outstanding top quality mechanical properties.



PO⁵ version

5 LAYERS

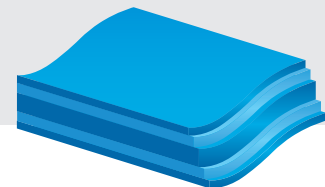
PE

FUNCTIONAL LAYER

PE

FUNCTIONAL LAYER

PE



Examples
of possible
applications



**The Techno Flex® series
production range
is wide and comprises,
among others:**

- film used in top performing converting and printing lines
- film with specific characteristic intended for industrial applications







BARRIER FLEX®*

Blown Film lines for the production of barrier and high-barrier film with symmetrical and asymmetrical structures (5, 7, 9 and 11 layers)

Co-extrusion lines of this series are intended for customers manufacturing top class high-barrier technical film for food, medical, pharmaceutical and several mechanical (e.g. automotive) applications.

The films produced with **Barrier Flex®** have a **double and triple barrier**, respectively, with an EVOH central layer combined with PA layers, thus offering a high performing barrier against gases and water vapour. Besides, Bandera offers extrusion lines capable of ensuring minimized curling effect in case of asymmetric film structures.



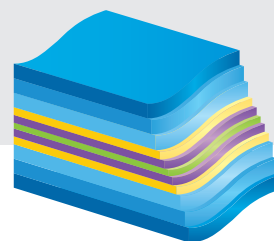
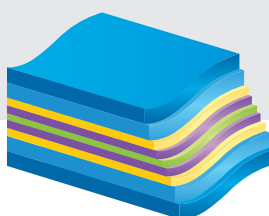
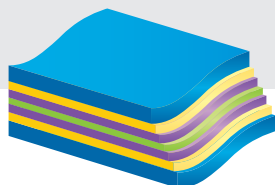
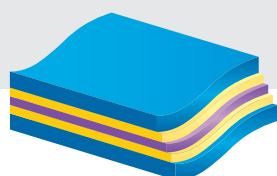
Examples of typical formulations

5 LAYERS
PE
TIE
PA/EVOH
TIE
PE

7 LAYERS
PE
TIE
PA
EVOH
PA
TIE
PE

9 LAYERS
PE
PE
TIE
PA
EVOH
PA
TIE
PE
PE

11 LAYERS
PE
PE
PE
TIE
PA
EVOH
PA
TIE
PE
PE
PE



Examples of possible applications





HDBFLEX®*

Initial focusing on offering extrusion lines pursuing excellent mechanical characteristics, weldability, processability and printability, today the market trends require minimized film thickness aimed at maximizing product capacity up to 450 kg/h - 993 lb/h (based on HDB size)

Bandera has taken on this new challenge finding out specific solutions to meet its customers' individual needs, thus confirming - once again - its outstandingly strong customer satisfaction orientation. Specifically, innovative solutions have been applied in every and each extrusion line section.

HDBFLEX® MAIN FEATURES

- Triple-flow cooling ring, which offers a strongly enhanced production capacity when combined with Bandera design extrusion heads
- Specific haul-off units and cooling cages with cutting-edge film cooling system for a better creaseless film surface - a solution setting the pace in innovation in HDB film field
- Integrated thickness control
- Fully-automated winding station, either by contact or by axial winding



Examples
of possible
applications



applied to the processing of cutting edge thermoplastic materials for the production of industrial bags (HDB/FFS)

applied to the processing of cutting edge thermoplastic materials for the production of industrial bags (HDB/FFS)







Bandera is a worldwide leader in the production of complete multilayer Blown Film lines dedicated to agricultural film



Nowadays, 5 and 7 layers co-extrusion lines are preferred as they satisfy the current requirements for agrifilm.

The multi-layer film ensures an enhanced management of raw process materials and optimized additive distribution in every layer, thus increasing film physical and mechanical properties as well as light and heat transmission: as a consequence, the film life cycle is increased.

Bandera agrifilm co-extrusion line flexibility and versatility is increasingly appreciated by customers, considering that, as a matter of fact, agrifilm is a seasonal product. With the same co-extrusion head and minimized set-up times, Bandera co-extrusion lines can produce agrifilm as well as thicker film (e.g. waterproofing geomembrane): a valuable chance to have an all-year-round profitable co-extrusion line, regardless of agrifilm seasonality.

AGRIFILM APPLICATIONS

- Greenhouse cover film
- Silo-bags film
- Silo-stretch film
- Solar sterilisation film
- Mulch film
- Low walk-in tunnel film

Line configuration	Die diameter	Open width
3-layer	up to 2500 mm (98.9")	up to 24 m (78 ft)
5-layer	up to 2200 mm (86.6")	up to 20 m (65 ft)
7-layer	up to 2200 mm (86.6")	up to 20 m (65 ft)

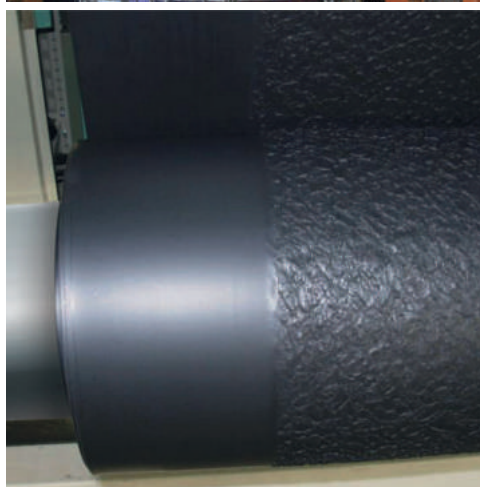


Examples
of possible
applications





Bandera offer comprises complete extrusion lines, with film thickness up to 3 mm (118 mil)



GEOMEMBRANE EXTRUSION LINES STANDARD CONFIGURATION

- Dosing system
- High-capacity extruder for the inner layer and two smaller extruders intended for the outer layers, arranged with bimetallic barrel and no-wear coated screw
- Co-extrusion head (die up to 2300 mm - 90.5") equipped with internal bubble cooling system (IBC)
- Fixed haul-off unit, suitably designed for production needs
- Fully-automated winders, 8.5 m (334") width, with automatic shaft extraction and reel downloading

Geomembrane can be textured on one or both sides; a plain strip can be obtained to ease welding.

This product can also be processed with extrusion head for the production of agrifilm.

Bandera geomembrane extrusion lines can be personalised according to Bandera's customers' needs.

WATERPROOFING GEOMEMBRANE APPLICATIONS

- Landfills
- Tunnels
- Collection tanks
- Water basins
- Irrigation channels
- Extraction mines
- Motorways
- Strengthening works at river and marine water flows
- Dam protections

THICKNESS RANGE

- Min thickness: 0.5 mm (19 mil)
- Max thickness: 3 mm (118 mil)

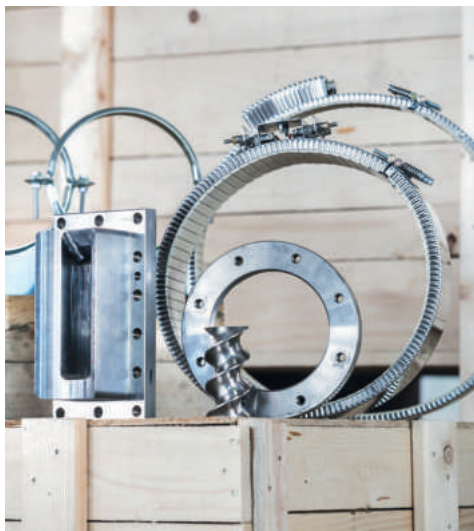
USEFUL WIDTH

From 6 ÷ 8 m (20 ÷ 26 ft)

Geomembrane

is the most unique
product in tubular
Blown Film sector,
**with unique
characteristics**





Why choose Bandera as a technological partner?

Over the past years Bandera has strengthened its leading position in its reference markets worldwide of packaging film, agrifilm and waterproofing geomembrane sectors.

Why choose Bandera?

- Unrivalled expertise in manufacturing complete Blown Film extrusion lines
- Worldwide appreciation
- Pace-setting **know-how** from the collaboration of **leading packaging companies and expertise in small-, medium- and large-sized Blown Film extrusion heads manufacturing**
- Wide extrusion head range
- Extended expertise in winding units
- Rooted collaboration with tested reliable **sub-suppliers**
- Timely and efficient after sales service
- **ISO 9001:2000 certification**

A responsive and efficient Customer Service

- **6 After-sale service centres** for a worldwide assistance
- **Top class on-site technicians** specialised in installation and start-up
- **Customised procedures training** for new applications
- **Scheduled interventions** 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.



ANY MA® is an agile and modular system to optimize plant automation and introduce innovative features.

It guarantees a reduction in commissioning and problem-solving times by the assistance.

The **ANY MA®** system is particularly suitable for lines with a high degree of automation, able to receive dedicated assistance and minimize machine downtime.

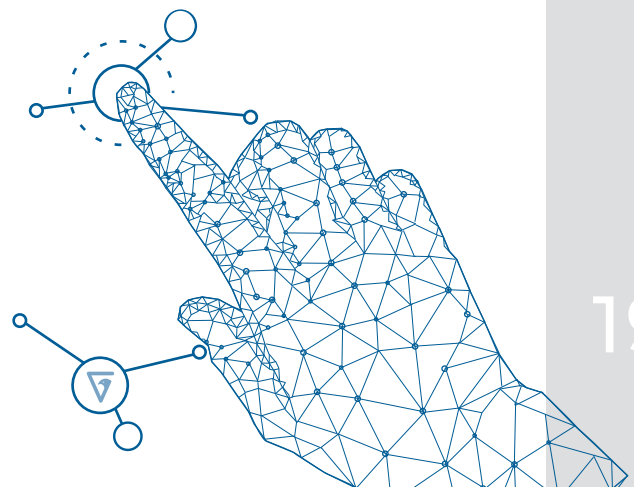
ANY MA® helps the customer to create an innovative production environment.

BENEFITS

- Design operator interface, studied by **User Experience experts**, to have extremely **fast learning times**
- **SW modularity** of the core with managed and constantly maintained libraries
- **Rapidity in commissioning** and remote assistance service
- **Release of updates** on lines with standard functionality (even after commissioning)
- The use of the **Siemens TIA Portal and Unified platform** guarantees a lasting investment both in terms of software (PLC, Motion, HMI, SCADA) and hardware
- **Product** recipes, **material** recipes and **reporting**, trend analysis
- **Revamping of extrusion lines of any manufacturer** (after evaluating the existing hardware and possibly proposing an update), to standardize the user experience and integrate the functionality and characteristics of the new generation lines

EXTRA FEATURES

- **Autopilot** - starts the machine independently according to the production
- **Wizard** - makes work easier with guided procedures
- **Automatic Purge** - automatic cleaning of the extruders at the end of production, saving time and materials;
- **Cam Inspection** - a system of cameras positioned at strategic points to remotely monitor the line and help remote assistance
- **Dashboarding** - for an overview on the operating status of the machine both in terms of production and energy (even from mobile);
- **Datalogging** - production and non-production data collection, in cloud or in local storage memory
- **Format change** - support for automatic format change to speed up production changes; less waste of material





RECYCLING



BLOWN FILM



FLAT DIE



PELLETIZING



EXTRUSION

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BANDERA
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