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### TECNOMATIC AT K-SHOW 2019

## Ready for Industry 4.0

**Industry 4.0 technologies, energy and performance efficiency to increase productivity and to reduce risks in the pipe manufacturing process**

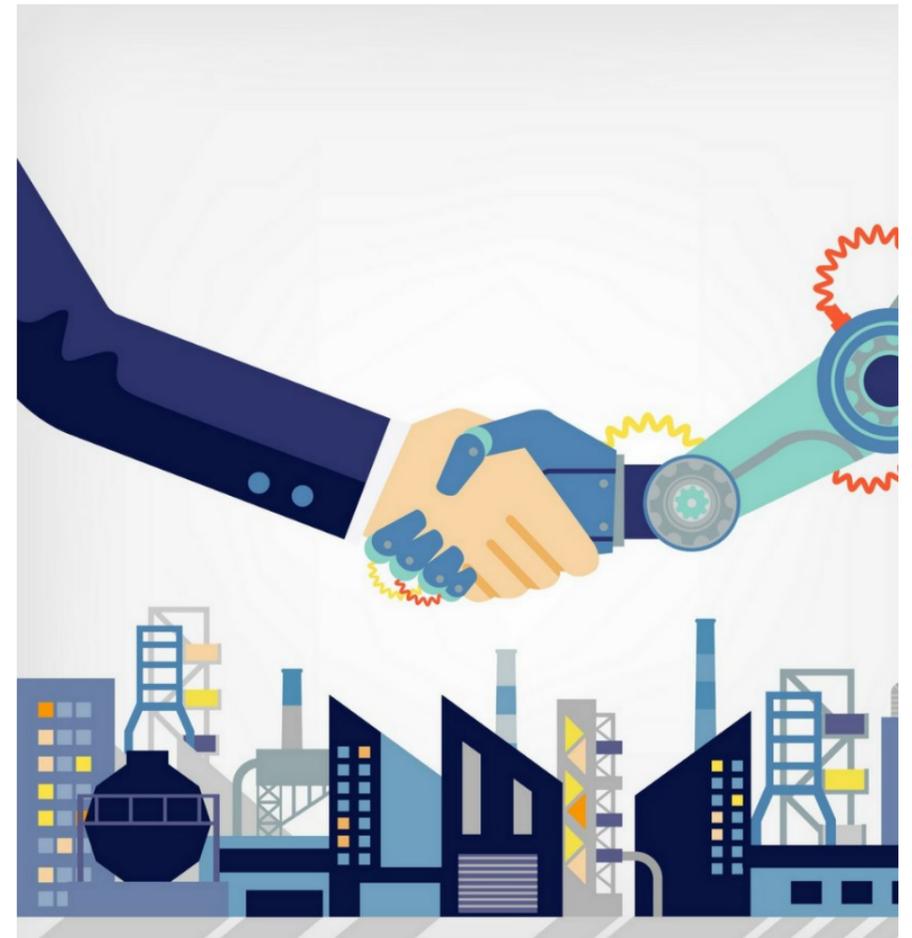
By Massimiliano Vailati

Pipe manufacturers are more and more oriented towards cost efficiency and energy saving, but always aiming at the best performance and output rate achievable for their pipe extrusion lines. Renowned as a top producer of machinery for the production of plastic pipes, with over than 40 years of experience in this sector, Tecnomatic will exhibit at the next K-show innovative solutions for pipe extrusion, to assist customers not only by supplying extruders and die-heads, but as well by providing complete production systems for a business which is getting increasingly demanding.

At K-SHOW 2019, in HALL 16 BOOTH D 05, Tecnomatic will exhibits one extruder and two die-head, part of its well known range of products and will introduce customers to the next industrial revolution, known as Industry 4.0

### FOCUS ON INDUSTRY 4.0

An innovation which will change the future and it's already changing the present is definitely



“INDUSTRY 4.0”, which is becoming increasingly important and is involving more and more factories. Industry 4.0 plays a strategic

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### INDUSTRY NEWS

## Tecnomatic beats market trends: sales and market share grow again in 2019

**Tecnomatic achieved its best year of sales growth in more than ten years in 2019, confirming the ability of its business model to deliver robust performance and create significant value.**

By Roberto Seghezzi

The growth trend, starting from 2017, consolidated in 2018 (+14%) and has become a fact for 2019 (+38%). The result is particularly good in terms of orders collection, quality of the projects developed and market sharing.

The decrease in operating margins requires a constant commitment to allow a further increase in the quality level and the optimization of internal costs.

These goals are carried on maintaining a short supply chain and without delocalization to far-east markets, according to the company vision to be a technology leader instead of producing in volume.

*“For Tecnomatic this trend represents the recognition of many years of professional working”*

The international market generates about 90% of the company's revenue and it's therefore a strategic market.

Recent years have been very positive particularly for Northern and Eastern Europe, which confirmed the trends of past years, while outside the EU area, an expansion, came from the Russian market. The NAFTA area, enjoyed strong demand from the oil and shale gas sector, which empowered the tube

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An advertisement for Tecnomatic. It features a close-up of a person's face on the left, with a QR code on the right. Below the QR code is the slogan "THINK OUTSIDE THE BOX". At the bottom, there is a small image of a pipe extruder machine and the Tecnomatic logo. The logo consists of a stylized 'T' inside a circle, with the word "TECNOMATIC" underneath. Below the logo, there is a small line of text: "TECNOMATICS PER PLASTIC PIPES PROCESSING". At the very bottom, there is a line of text: "Tecnomatic Srl | Bergamo | Italy | tel. +39 035 310375 | tecnomatic.it".

# Die-heads technologies for pipes with protective layers

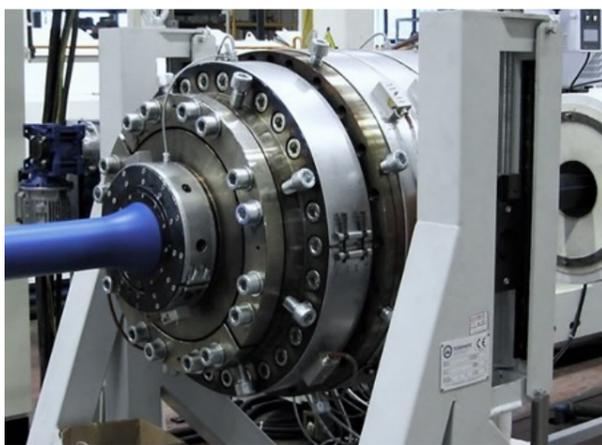
The solution to the increased requirements concerning the protection of the pipe, especially in trenchless installation, is provided by an additional protective layer.

By Simone Lavagna, Alessandro Taramelli

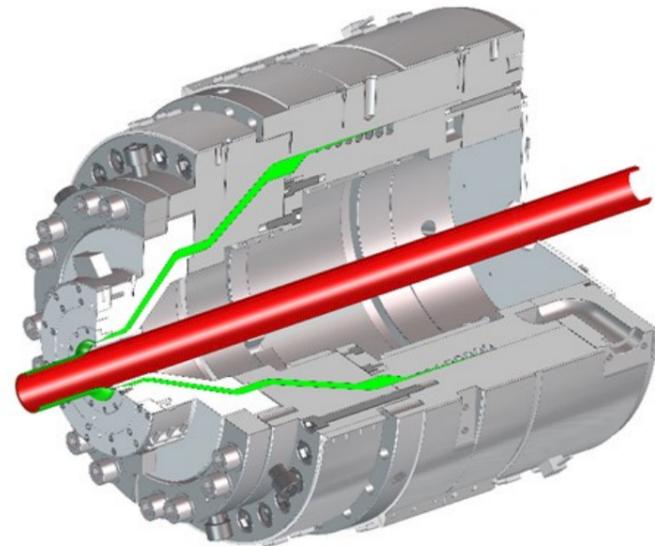
The inherent flexibility of polyethylene has enabled a wide range of techniques, including thrust boring, directional drilling and pipe bursting, to be used to install polyethylene pipe systems. Multilayer pipe systems have been developed with the specific objectives of improving the protection of the pressure pipe during such installations to maximize the quality of the pipe system. This pipe, with a peelable outer skin, has provided significant economic and environmental benefits in water distribution pipelines and is currently being proven and introduced in Gas distribution networks.

The jacket is made of a specially modified polypropylene which protects the surface of the inner pipe against potential notches and cracks generally associated with demanding installation methods such as pipe bursting or wash-boring. Even extremely deep scores in the protective jacket will not be transferred to the inner pipe when it is eventually exposed to service-related stresses. The core pipe is made from either PE resins, the protective coating is more than three times harder than the inner pipe from PE 100. The dimensions of the core pipe match those of standard solid wall PE pipes. "Adhered" to the outer wall of the PE core pipe is a tough skin, which is typically 0,6 to 0,7 mm thick for all current dimensions of this new multilayered pipe.

The skin is added by a cross-head positioned before of the last cooling bath. To fulfil the needs of production of coated pipes with protective layers, Tecnomatic has devel-

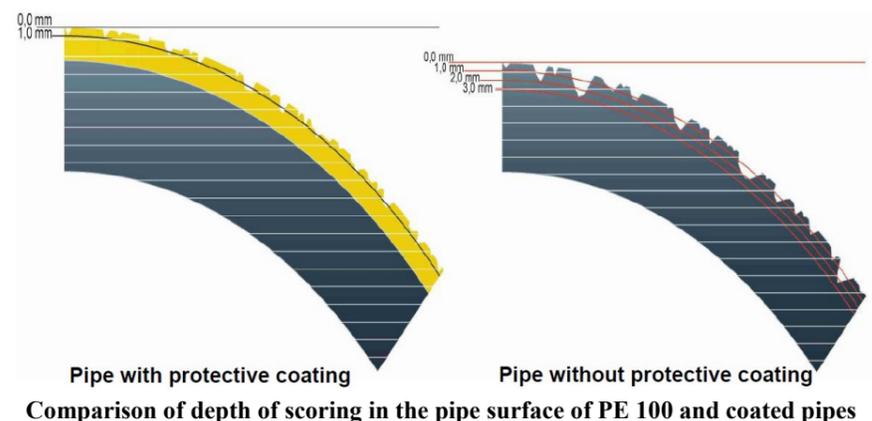


VENUS COAT 400



oped a full range of die-heads, based on spiral or radial technology suitable for both plastic or metal pipes coating with range from 5 to 800 mm, and solutions up to 4 layers. The die-heads are based on a typical spiral technology for large and single

layer co-extrusion, while mix solution with radial distributors or short path spiral are offered according to material characteristics or volume as for PA, EVOH, PVDF or adhesive bonds.



Continued from page 1

role in coordinating, synchronizing and analyzing the machinery's process, as well as supplying very important data to the human operators. Therefore the production process

pipes manufacturers a complete and integrated portfolio of products, solutions, industrial software and automation technologies.

The system provides a simple user-friendly program for the networking of extrusion pipes lines. Via the machine's EPC (Extrusion Process Control) system, several machines and peripherals are connected and linked together to be operated via a uniform user interface, which enables interaction between the individual appliances. In this way, the entire manufacturing process, including material feeding, temperature control, synchronisation is coordinated and tracked. Another important point is having all parameters central-

ly recorded and monitored. The system allows, not only to carry out energy monitoring, but to convert numbers and data into valuable information on the processes within the line. This enables optimal analysis of a line's performance. From the relevant key performance indicators

(KPI) for shift supervisors up to the clear presentation of the line performance for the management.

Perfectly in line with the concept of "smart factory" of the Industry 4.0, all data, including preventive maintenance and service parameters or alarms can be monitored via internet or intranet, to Pc, servers or to mobile devices. Currently, Tecnomatic's PIPE 4.0 system is the most cutting-edge software for plastic pipes extrusion. Certain that it will be essential to better face the ongoing Fourth Industrial Revolution, Tecnomatic has already made it available on the market. Positive customer feedback relating to improved plastic pipes extrusion, due to better monitoring and management, is what gives Tecnomatic the certainty that it is heading in the right direction.

**The investment on Industry 4.0 brings about many advantages as:**

**- Predictive lines management:** maximize lines utilization and minimize unplanned downtime. Optimization of planning and scheduling of maintenance activities. 1. Reduction

of failures and downtime. 2. The prediction model generates alerts and recommendations

**- Process management and control:** minimize production variability and improve quality, e.g. addressing production on the most efficient lines according to the kind of pipe.

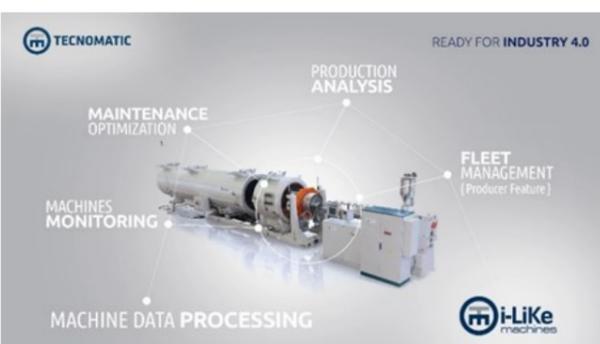
**- Energy management:** Reduce energy costs through energy monitoring for line and process.

**- Production analysis:** monitor lines, processes, people and products on a continuous real-time basis. Display KPI's (key Performance Indicators) and usage reports.

**- Production simulation:** manufacturing and down-time planning, costs forecasts.

**- Safety management:** connected technologies can help companies in continuously monitoring and recording products and quality for each produced lot, as well any generated waste (records of dimensional changes, temperature instability, breakdowns)

**- Production forecasting:** adjust production schedules in line with changing customer needs, raw material availability.



Machine data processing



Production analysis and data collection

will be more accurate and will make the human operator work easier.

At the exhibition customers will be introduced at the system, aimed at supporting the new digital industrial revolution, providing to the plastic

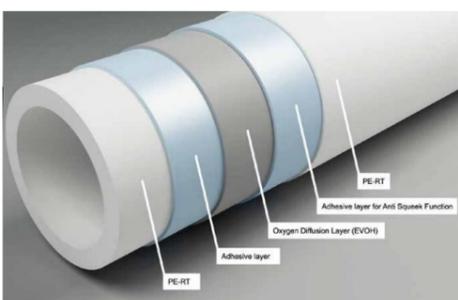
# Enhanced performance and innovation in the production of heating & plumbing multi-layer pipes

Renowned as a leading manufacturer of lines for polyolefin and PVC pipes, Tecnomatic continues to improve the technology and performance for the production of complex pipes with functional layers.

By Massimiliano Fenili, Simone Lavagna, Roberto Seghezzi

Domestic plastic pipes have experienced a significant increment in their use in this market. The advances in research and development of materials have made the plastic pipes to be nowadays one of the materials to choose for the water supply, due to the economic and balance that they represent. The advantages of the plastic pipes are among others, the no corrosion and resistance to many chemical products. They are flexible and easy to install, they can join by fusion, and they are light so they facilitate the transport and its handling.

Many years of experience, supplying lines for multilayer pipes, has made Tecnomatic's product one of the most reliable and performing for the production of structural pipes for those applications. Nonetheless the company hasn't stopped to innovate and has recently delivered, to a main European producer, a multi-purpose line for the production of both Polybutene and Pex pipes in five layers.



PE-RT five layers pipe section



High speed line for the production of five layers Pex and Polybutene pipes

The key-component of the line is a further developed model of the ATHENA die-head series. Based on a radial distributors design, the product has been optimized with slight modification to reach even more flexibility and accuracy in the distribution, especially important to shape the EVOH and adhesive into very thin and uniform layers.

The radial distributors do not have any dead zones or edges where material could stop and grant an easy

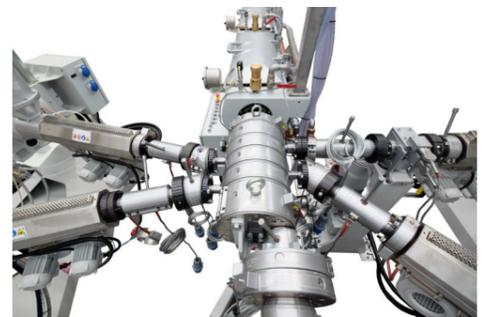
cleaning and rapid assembling/disassembling operation. Radial spirals allow low pressure losses and high flexibility in terms of layers structure (thick or thin layers) and number of layers, while their short flow path leads to reduced residence time and rapid material and colour changes.

The line which has a working range from 8 to 32 mm, is characterized by performance up to 50 m/min

The line which has a working range from 8 to 32mm is characterized by performance up to 50 m/min for the five layers Pex or Pe-rt in diam. 16 mm, and up to 40 m/min for most of

the Polybutene pipes diameters.

To reach this performance every part of the line has been studied in minute detail. The extrusion line configuration consists of a main extruder ATLAS 60.30 in a gearless version, to reduce maintenance and to optimize energy consumption, while co-extruders MIZAR and ATLAS 30 are used for adhesive, EVOH and external layers. All the extruders work in synchronization mode and are integrated and fed by multi-components gravimetric systems. A double ultrasonic wall thickness station and eccentricity scanners, with central symmetrically adjustment, continuously control all the pipe parameters during the production process to ensure a top quality pipe. To



ATHENA five layers die-head

manage the high speed coiling the line is completed with a fully automatic coiler of the company FB Balzanelli, especially designed to process both Polybutene and Pex coiling.

Continued from page 1

business and pushed investments in new machineries. The ME market also showed signs of improvement linked to the renewal in oil prices.

*"For Tecnomatic this trend represents the recognition of many years of professional working, expanding our portfolio with new active partners, consolidating the existing relationships and showing our focus to customers needs"* said Massimiliano Vailati, Sales Director.

*"We will continue to strengthen our R&D and expand our offer, increasing the operating efficiency and delivering a robust growth-up support to all the manufacturers. We will continue investing in new technologies and overcoming expectations. In the digital transformation, we walk together, on front line with our clients developing the Industry 4.0 concept with our PIPES 4.0 software."*

said Diego Lupi, CEO.

## Large diameter extrusion lines, up to 2 600 mm

By Massimiliano Fenili, Luca Visani

The die-head of the Venus series by Tecnomatic covers a range of production for Pe pipes from 5 up to 2,600 mm, listing the company between one of the few manufacturers in the world, able to produce machines and lines for large dimension pipes.

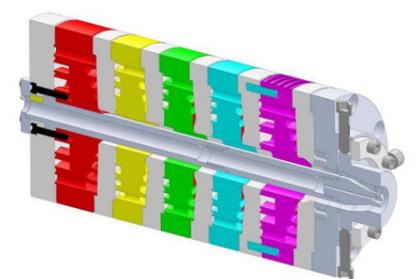
The innovative concept offered by Tecnomatic for the production of large diameter pipe extrusion, is that two extruders are used, in order to reach higher performances. The high production heads feature two spiral distributors, fed each one by one extruder.

The availability and reliability of high output extruders is limited, therefore the idea to design pipe heads which work with two single



screw extruders. Both extruders should have high capacity, same size and should be equipped and synchronized with an accurate dosing system to ensure a correct meter weight control.

This procedure increases line



### ATHENA advantages

- Short flow paths and low melt volume for a short residence time.
- Rapid material and colour changes.
- Optimal melt flow and layers uniformity.
- High flexibility in terms of layers structure and number of layers.
- Easy cleaning and a rapid assembling/disassembling operation.
- Lower costs compared to axial spiral structures.

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**TECHNOLOGY**

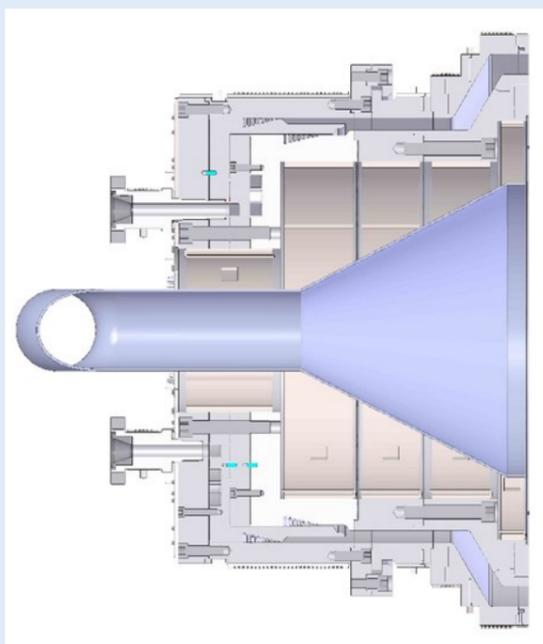
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turnaround times due to increased production capacity.

The concept of the big pipe heads VENUS 1600 & VENUS 2600 is based on two spiral distributors designed for the new PE 100 materials. Both pipe heads have two spirals inside with the same geometry. The system is comparable to a Co-extrusion one.

The sophisticated melt distribution system is short in length and low in volume to reach the shortest possible residence time. The big thoroughfare in the centre allows an air exchange inside the pipe at high volume.

The melt feeding points are horizontally positioned and allow a parallel arrangement of the extruders leaving enough space for the ducts of the pipe air cooling system. Thanks to the new spiral geometry design low pressure and best melt distribution is achieved, while the inside heating/cooling unit grants a uniform tem-



VENUS 2000 section

perature control and distribution.

The Tecnomatic die-heads, for large diameter pipes, are compact and short in length and the working system is based on a swelling production process. Properly sized die-sets allow also an easy and quick disassembling and cleaning.



Large diameter HDPE pipes for outfall and intake emissaries

Main advantages of two spirals head technology can be summarized in:

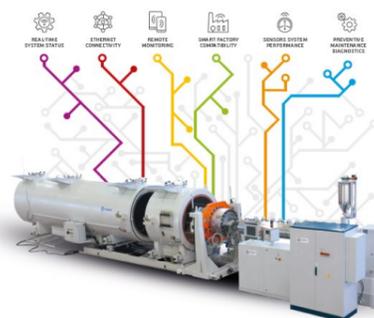
- High output
- Low shear of the material at high output
- Best temperature distribution inside the head thanks to an optimal tempering system
- Short head dimension
- Smaller basic head and bigger die make the volume low and residence time short
- Inner pipe air cooling
- Short die-sets design
- Wide range
- Pipes can be produced as two layers

To produce pipes of such dimension, and to feed the Venus die-heads with high capacity, the lines are equipped with single screw extruders of the Zephyr series. These extruders in L/D 40, offer a large number of innovative solutions that distinguish it and make it one of a kind in the market of pipe production. The key point and guideline of the new project was to increase the output rate at lower melt temperatures and power consumption. The result has been achieved thanks to the adoption of a spiral grooved feed bush and to further improvements in screw design. The new feed bush ensures minor friction, commonly generated by raw

material transport, with subsequent increasing of the specific and total throughput. The further development in screw design, with optimisation and enhancement of torque and shearing elements, have improved the output but have also led to process the material at lower melt temperatures. The use of two extruders of the Zephyr series, in size 75 or 90, allow the production of pipes with rates up to 3000kg/h.

The performance of these lines gains definite advantage from the suitable design and correct use of tanks and down-stream. A long time experience makes of the Tecnomatic's downstream a reliable solution for an accurate production and to keep the pipe's shape, while selected leading companies are the reliable suppliers of the haul-off and cutting systems.

**INDUSTRY 4.0**  
Enabled



Enhance the concept of pipe extrusion.

The investment in INDUSTRY 4.0 brings about an increased productivity and quality of the processes, and as a consequence a reduction of the overhead costs. Tecnomatic's PIPE 4.0 is the most up-to-date and state-of-the-art dedicated software in the market. INDUSTRY 4.0 allows preventive maintenance procedures and the recording of the efficiency of the machines themselves, but in particular it records all production activities, providing precise and timely data on order management, production phases and estimates and calculates production costs.



**MARKETS**

**Upcoming events**



07—08 November 2019  
Sydney, AUSTRALIA



28—31 January 2020  
Moscow, RUSSIA



09—11 March 2020  
Algeri, ALGERIA



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