



# ENERGY EFFICIENCY IN EXTRUDING PROCESSES



## Production

“The retrofitted measurements provide us with the data we need for our energy management. It is a particular advantage for us that the measurement technology does not require any intervention in the existing piping system. This saved us a longer plant shut-down and the complex emptying of the heating circuits.”

Kyriakos Mystikos,  
R&D Manager for Technical  
Textiles, Thrace Nonwovens &  
Geosynthetics S.A.



## Measuring Task

### Non-intrusive measurement of thermal energy flows in the manufacture of polypropylene fabrics

At its headquarters in Xanthi, Thrace Nonwovens & Geosynthetics S.A.

produces, among other things, synthetic woven and needle-punched nonwoven textiles. With a high level of vertical integration, Thrace Group combines cutting-edge technologies from processing to finishing to provide innovative materials that respond to any type of customization needs in specifications, product variety and design.

The main raw material for the synthetic textiles is polypropylene (PP). The thermoplastic material melts at about 320 °F and can be drawn into yarns in extruders. The extruder lines use thermal oil at over 390 °F for drawing and annealing of the yarns. The extrusion process is crucial for the quality of the end products. At the same time, energy is a decisive cost factor in production. Therefore, the process engineers at Thrace were looking for a way to measure the total heating power provided as well as the consumption of the individual extruders. The measuring experts from TCB Avgidis Automation knew what to recommend: For this type of



measurement task, Flexim's clamp-on ultra-sonic technology is the ideal solution.

## Solution



When it comes to retrofitting a device for flow measurement in existing pipeline systems, non-intrusive ultrasonic measurement with FLUXUS® has always been the obvious solution. Setting up a flow measuring point with FLUXUS® does not require any opening of the pipe and therefore does not affect production in any way.

However, the FLUXUS® ultrasonic systems from Flexim are not just flow meters, but can also be used as heat meters.

Heat flow measurement with FLUXUS® is carried out using the differential method, i.e. by determining the amount of heat flowing into and out of the system. For this purpose, in addition to the flow rate, which is measured at the colder return of a thermal consumer, the temperature must also be recorded in the supply and return.

FLUXUS® calculates the current output of the system, i.e. the energy flow, from measured values based on enthalpy curves which are stored in the device for various heat transfer media. FLUXUS® can also be used as an energy meter due to the totalizer function integrated in the measuring transmitter.

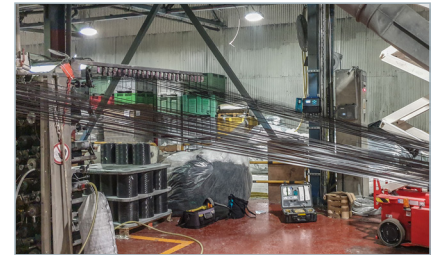
In Xanthi, the decision was made to equip a total of six heating circuits with FLUXUS® clamp-on ultrasonic systems from Flexim. Three transmitters are sufficient for this. The FLUXUS® F722 transmitters are available in dual-channel versions that can be used to measure at two measuring points simultaneously. The measuring points were set up as usual during ongoing operation of the plant. The integration of the measurements into the plant's control system is carried out via Modbus.

With the retrofitted measurements, plant operators can now, for the first time, track energy consumption in the area of PP yarn production and precisely allocate it to the individual extruders. The consumption transparency achieved opens up the possibility of needs-based predictive maintenance and further optimization of operations.



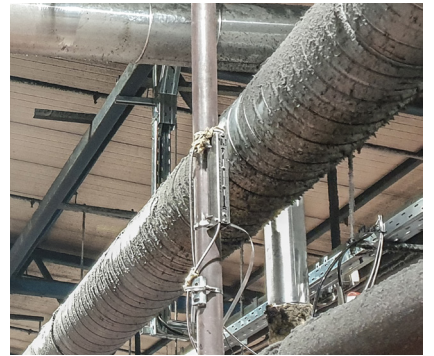
*The production plant of Thrace Nonwovens & Geosynthetics S.A.*

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*Polypropylene yarns drawn from the extrusion line to the winding positions*

© Thrace Group



*Measuring point at the return line of an extruder with clamp-on transducers installed in the Variofix L transducer mounting. The insulation only has to be temporarily removed for installation.*



*The stationary FLUXUS® F722 is used as the transmitter.*

## Measuring Points and Instrumentation

<b>Pipelines</b>	1 x DN125, 1 x DN100, 1 x DN65, 3 x DN50, carbon steel
<b>Medium</b>	Heat transfer oil TOTAL Seriola 32
<b>Temperature</b>	~ 190 °C – 200 °C (in the return lines)
<b>Measuring Devices</b>	3 stationary clamp-on FLUXUS® F722 ultrasonic measurement systems (dual-channel versions)
	4 pairs of CDP2E52 clamp-on ultrasonic transducers
	2 pairs of CDM2E52 clamp-on ultrasonic transducers
	6 pairs of Variofix L transducer mounting devices
	6 pairs of Pt100 clamp-on temperature probes

## Advantages

- Simple retrofitting without interfering with the existing piping system. Minimal installation work and no cost for additional fittings and piping work
- Installation during ongoing production – full plant availability
- Cost-effective solution with dual-channel transmitters
- Precise recording of the individual energy consumption of the extruders
- Consumption transparency lays the foundation for further energy efficiency measures
- Excellent cooperation with Flexim's local representative, TCB Avgidis Automation S.A.

## Customer

### Thrace Nonwovens & Geosynthetics S.A, Xanthi, Greece

Founded in 1977 as Thrace Plastics Co S.A. in Xanthi, Greece, Thrace is today an internationally operating group with production, trade and distribution companies in 9 countries and 2,200 employees worldwide. Thrace operates in three business units: Technical Fabrics, Packaging Solutions, and Hydroponic Agriculture. In 2021, Thrace processed 110,000 tons of PP/PE and achieved a turnover of EUR 428 million.

Thrace Nonwovens & Geosynthetics S.A. was established in 2010, assuming all the Technical Fabrics' activities of Thrace Plastics. Today Thrace NG is producing PP technical fabrics and yarns/fibres.



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