Xplore
Xcelerate your
polymer innovation

Modular Composite Forming Platform

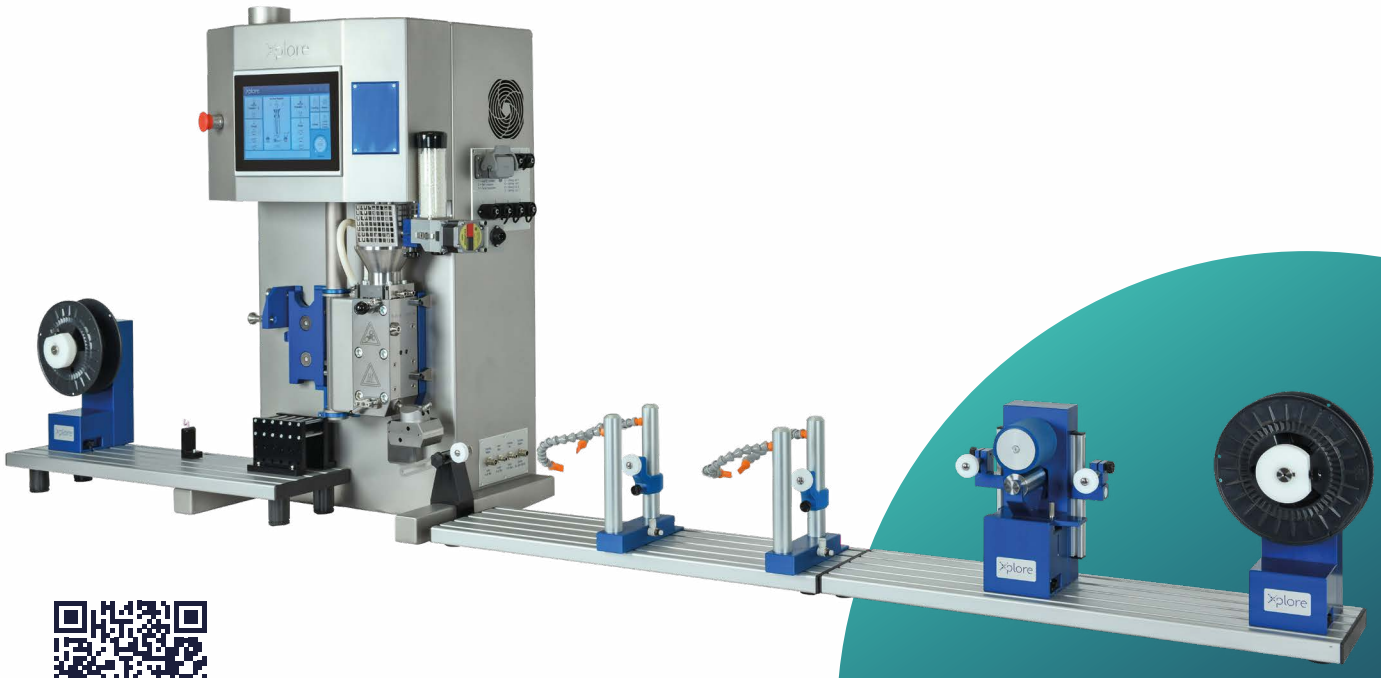
Reconfigurable Modules | Pre-Die to Post-Die Processing

Processing Solutions

The Xplore Modular Composite and Forming platform is a **laboratory-scale R&D solution compatible with Xplore Micro-Compounders for the development and evaluation of continuous composite products, such as filaments, microtubes, coated or impregnated fibre-tows, and unidirectional (UD) tapes**. Using only small material quantities, it reduces waste, cost, and development time while supporting material development, feasibility studies, and process optimization; enabling researchers to validate new material combinations or processing concepts before pilot/industrial scale-up.

Platform Advantages

- **Modular Platform:** Dedicated processing modules share a common platform architecture, enabling quick reconfiguration between composite processing applications.
- **Future-Proof Investment:** Supports up to five processing applications on a single platform, using application-specific dies to adapt the system as R&D needs evolve.
- **Seamless Integration:** Compatible with Xplore's Micro-Compounders to create complete laboratory-scale processing solutions.
- **Space-Saving Setup:** Replaces the footprint of up to five standalone units, freeing valuable bench and lab space.
- **Process Monitoring:** User-friendly software enables real-time monitoring of key processing parameters for greater insight and control during material development.
- **Scale-Up Confidence:** Builds on real-time process monitoring to generate consistent, comparable data across trials, supporting confident scale-up from lab to industrial production.



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System Configurations



UD Tape

Void-Free Impregnation | Customized Unidirectional Tape

Combines fibre spreading, impregnation and shaping for the development of unidirectional (UD) tapes.

- Adjustable fibre spreading with interchangeable pins for flexible fibre-path geometry.
- In-melt resin impregnation of spread fibres for void-free tape consolidation.
- Adjustable unwinding torque for controlled fibre feeding and consistent tension.



Microtube

Dimensional Precision | Concentric Geometry

Configures the platform for the development of small-diameter tubing with controlled dimensions and geometry.

- Microtube extrusion with multiple diameter dies and internal air pressure control for precise tube formation.
- Inline laser diameter measurement for continuous process monitoring.
- Adjustable processing parameters for dimensional control.



Coating

Uniform Coating | Fibre Tow & Wire

Equips the platform with heated coating dies to apply coatings to wire and fibre substrates.

- Controlled coating with a heated die, featuring adjustable inner and outer diameters for controlled coating thickness.
- Inline laser diameter measurement for continuous process monitoring.
- Adjustable unwinding torque for controlled substrate feeding and consistent tension.



Tow Impregnation

Precise Impregnation | Continuous Fibre Reinforced Filament Manufacturing

Supports the development of continuously impregnated fibre tows for composite applications.

- Fibre impregnation with interchangeable dies, controlled die temperature, and in-melt fibre spreading for uniform wet-out.
- Inline laser diameter measurement for continuous process monitoring.
- Adjustable unwinding torque for controlled fibre feeding and consistent tension.



3D Filament

Consistent Strands | Advanced FFF Materials

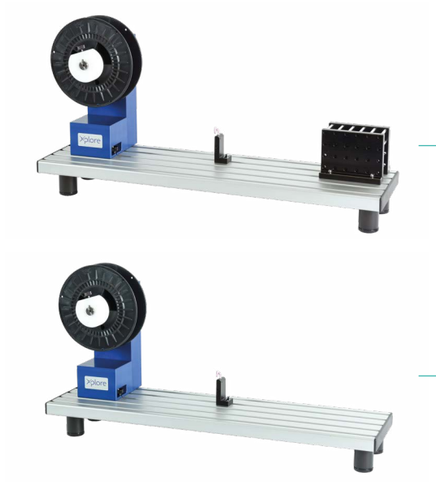
Enables the development of small-scale filament feedstock for additive manufacturing applications.

- Filament extrusion with interchangeable heated and/or non-heated dies.
- Inline laser diameter measurement for continuous process monitoring.
- Adjustable processing parameters for consistent filament quality and diameter control.

Shared System Features

Standard features included across all five system configurations

- Adjustable air pillars for flexible air cooling of the processed material.
- Godet pulling-speed control for stable product take-off.
- Adjustable winding torque for stable, tension-controlled spooling.
- Control box for line parameter adjustment and process data logging, including line speed, winding/unwinding torque, and diameter measurement.



Pre-die Extension

UD Tape Die

Microtube Die

Coating Die

Tow Impregnation Die

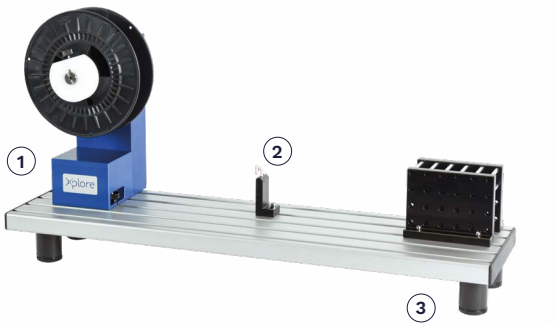
3D Filament Die

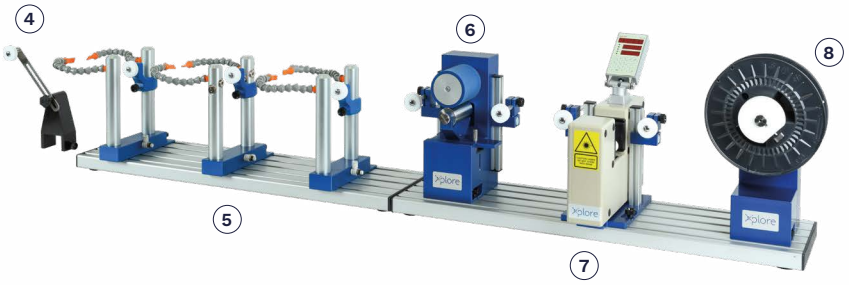


Post-die Extension



Control box





Platform features

1. (Un)winding unit
2. Pigtail
3. Spreader box
4. Guide wheel
5. Air cooling pillars
6. Transport godet
7. Laser micrometer
8. (Un)winding unit

Shared Platform Specifications

Line speed

0.2-18.0 m/min · 0.1 m/min increments

Die temperature

Room temperature to 425°C

Heated dies standard (optional for 3D Filament)

Die pressure

Pressure transducer optional

Not applicable to Tow Impregnation

Diameter measurement

0-25 mm · 1-axis or 2-axis laser

Power supply

110-120 Vac / 50-60 Hz, 3 phase, 16 A

220-240 Vac / 50-60 Hz, 1 phase, 16 A

Die Options by System

3D Filament

Heated: 1.75 mm or 2.85 mm

Non-heated: 0.15 mm, 0.25 mm, 0.55 mm, 0.75 mm, 1.00 mm, 1.25 mm, 1.50 mm and 3.00 mm

UD Tape

Width: 6.35 mm, 12.7 mm or 25.4 mm

(0.25” · 0.50” · 1.00”)

Tow Impregnation

Diameter: 0.25-5.00 mm (customisable)

Microtube

Inner diameter: 2.00 mm, 3.00 mm, and 4.00 mm (co-centric pins)

Outer diameter: 0.25–8.00 mm

(standard options: 4.00 mm, 5.00 mm, and 6.00 mm)

Coating

Diameter: 0.25-8.00 mm (customisable)

Footprint & Weight

150 x 20 x 30 cm

3D Filament: 33.8 kg

Microtube: 33.1 kg

250 x 20 x 30 cm

UD Tape: 41 kg

Tow Impregnation: 46 kg

Coating: 46 kg

Contact us at
xplore-together.com