

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.



Scan for
more info

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

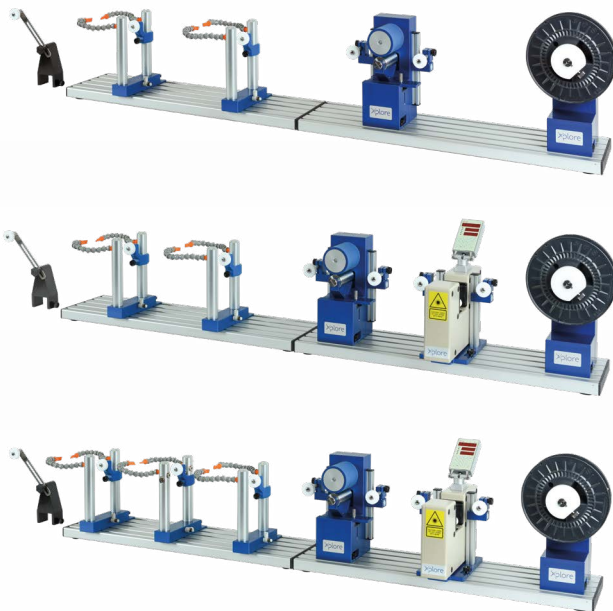
UD Tape Die

Microtube Die

Coating Die

Tow Impregnation Die

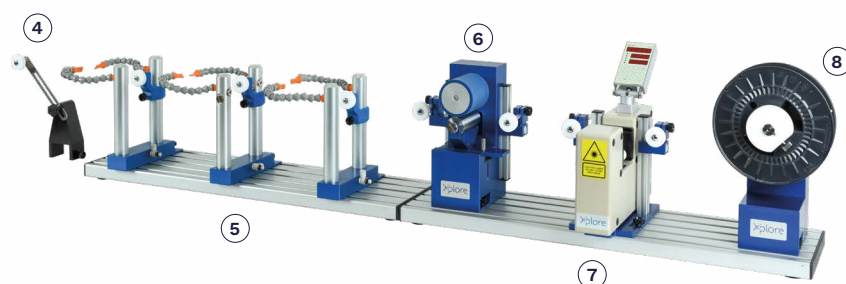
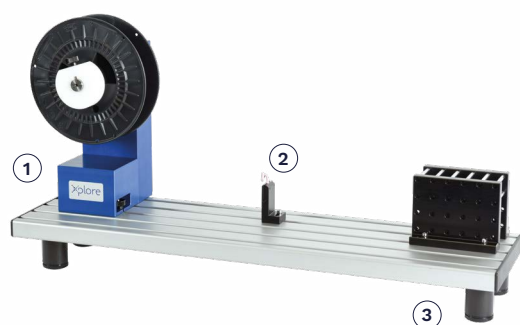
3D Filament Die



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