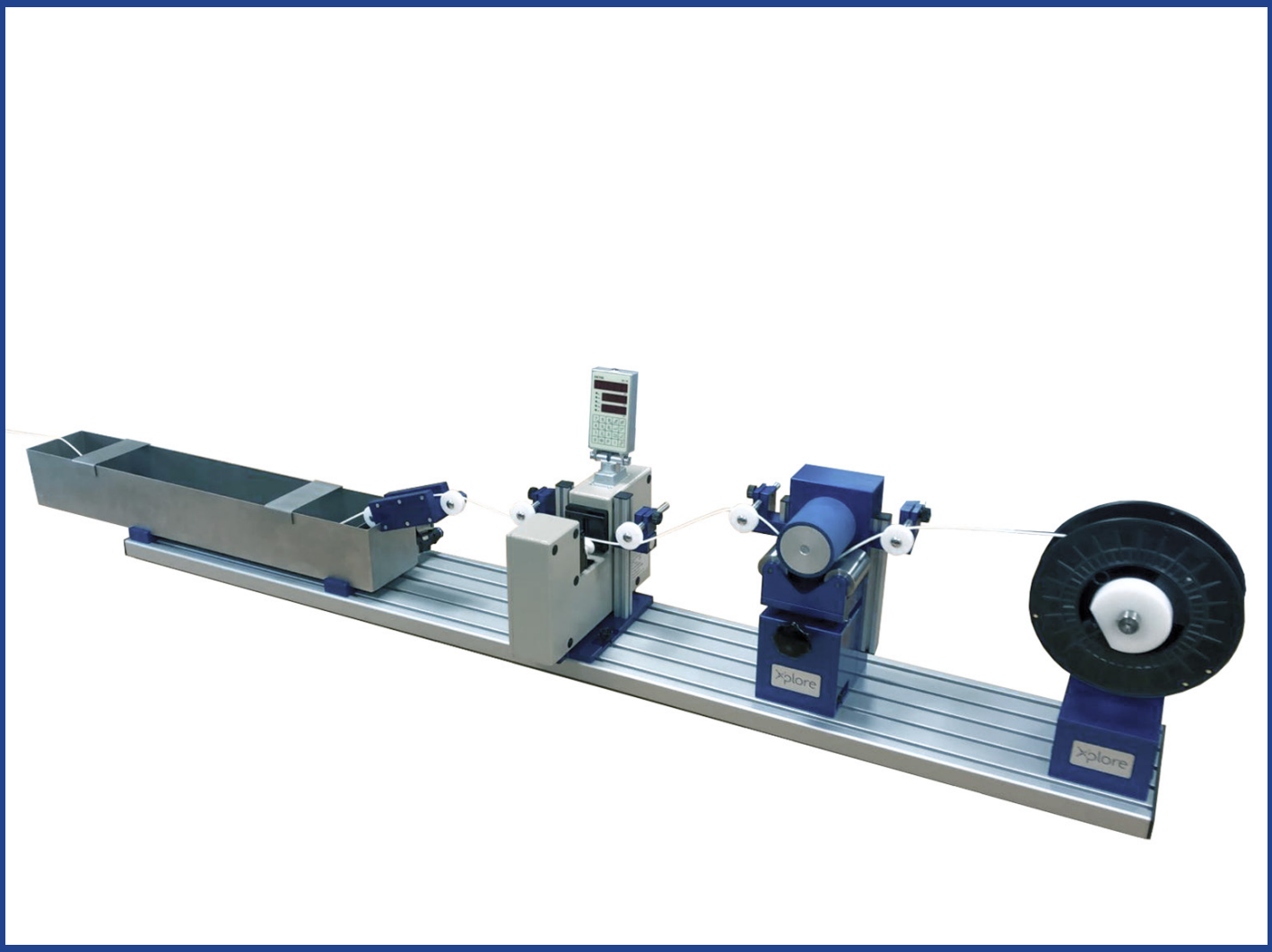
Xplore 3D FL
3D Filament Line

Compose 3D filaments from small amounts of material



Xplore
The platform for
polymer and rubber R&D

Add-on for 3D Filament development: reliable, reproducible and fast R&D results

Xplore Instruments BV introduces a 3D print filament screening add-on which enables you to produce FDM (Fused Deposition Modelling) filaments from polymeric materials with good dimensional stability from small amounts of material. This 3D print filament R&D line is a unique asset for the development of experimental nascent filament formulations. It will create custom product opportunities by delivering quick, reliable test results of filament samples for subsequent testing analysis purposes. When connected to our Xplore MC 15 HT or MC 40 compounder, it is a fully-fledged 3D print filament screening line to speed up your R&D efforts. Are you in R&D of 3D print filament compositions? Then this is a "must-have" screening tool.

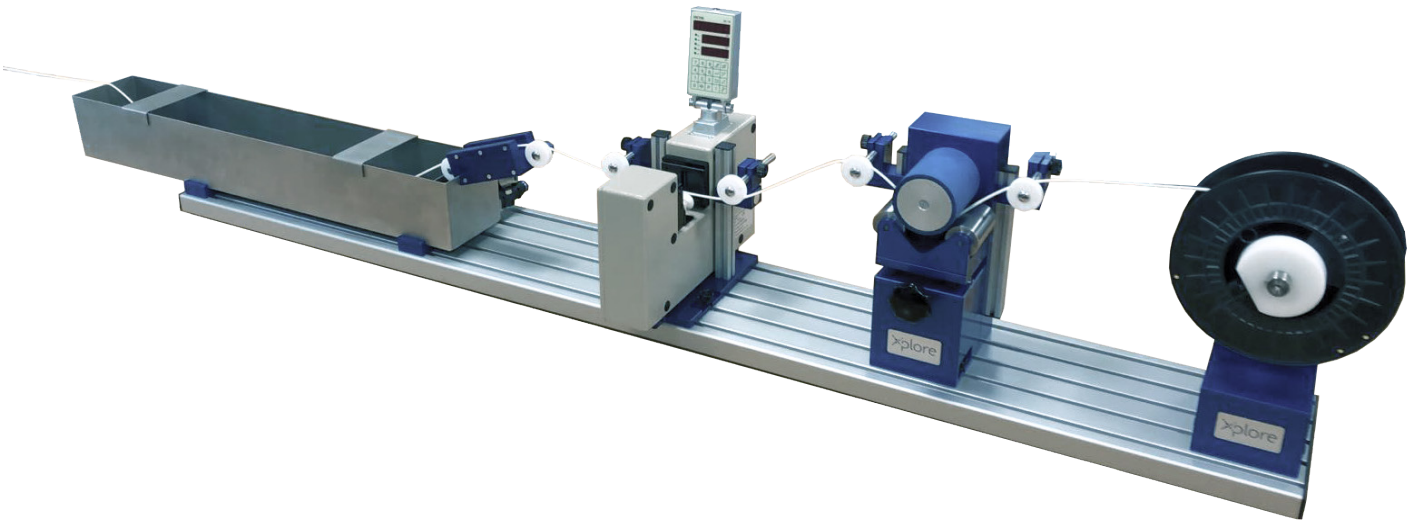
Our 3D Filament line add-on for our larger compounders offers you a solution to make your composition filament for FDM applications: reliable and reproducible, fast results with a minimum amount of material, minimum waste, less equipment and infrastructural costs. This laboratory 3D Filament Line can be combined with one of our larger compounders. In combination with the optional feeder of our larger compounders provides an accurate throughput of polymeric material, which is the foundation for a correct final diameter of the 3D print filament.

When combined with our MC 15 HT or MC 40 compounder, the 3D filament line should be equipped with an optional volumetric pre-feeding unit. The optional volumetric feeder of our compounders guarantees a pressure equilibrium in the barrel of the compounder. This enables a constant throughput of molten material at a given compounder screw rpm. Hence, a near-perfect starting point for 3D print filaments R&D. This will ensure a homogeneous, accurately dimensioned 3D filament without any voids.

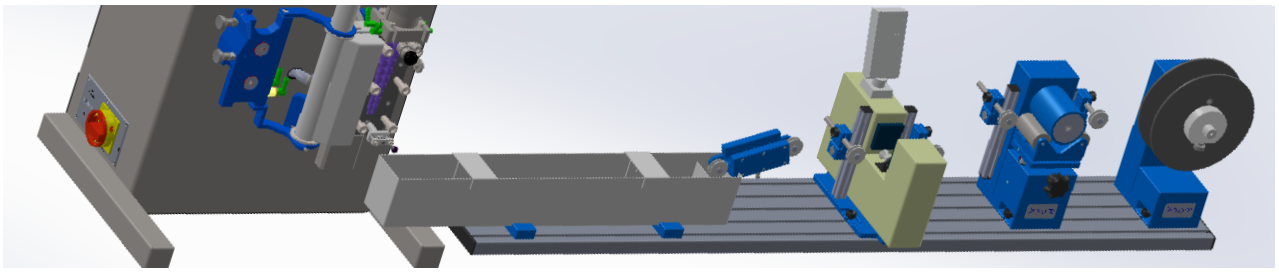
The filament line consists of a stainless steel water bath to cool down or control the temperature (no voids) of the filament. Note: Polymer compositions that are difficult to dry will skip the water bath section. The filament dryer at the end of the water bath guarantees a dry filament which is necessary to be accurately checked in the laser measurement unit, where the filament diameter is continuously monitored. Further downstream, the custom 3D print filament enters the transport godet where you can control the draw rate, enabling you to be flexible in your processing workflow. The inline draw speed can be controlled and monitored on the control box, which is part of the complete setup.

Finally, the 3D print filament needs to be wound onto a standardised industrial bobbin. The torque of this filament winding unit can be controlled to achieve tight winding of the filament.

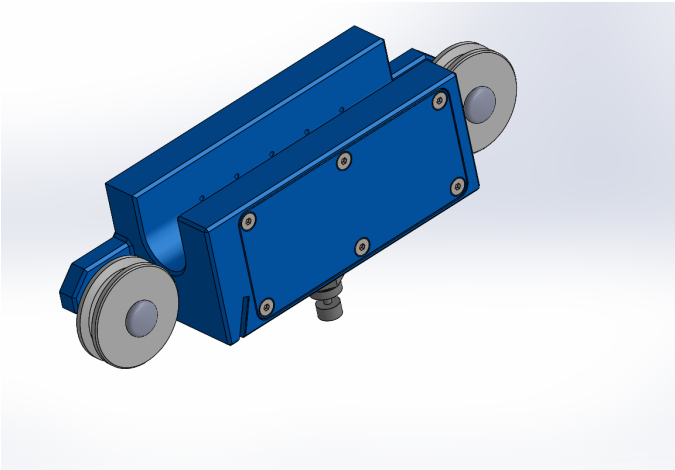
The 3D print filament line provides the basis to process the typical FFF polymers into an accurate filament, well within the industry norm of ø1,75 mm +/- 0,05 mm 3D print filament with unique (custom design polymer matrix) properties.



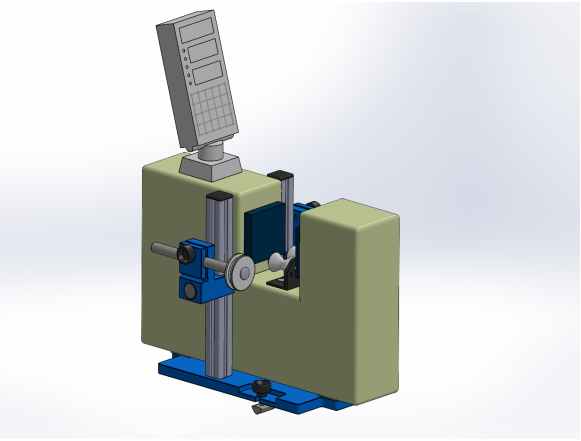
Full set up of Xplore 3D filament line for R&D purposes



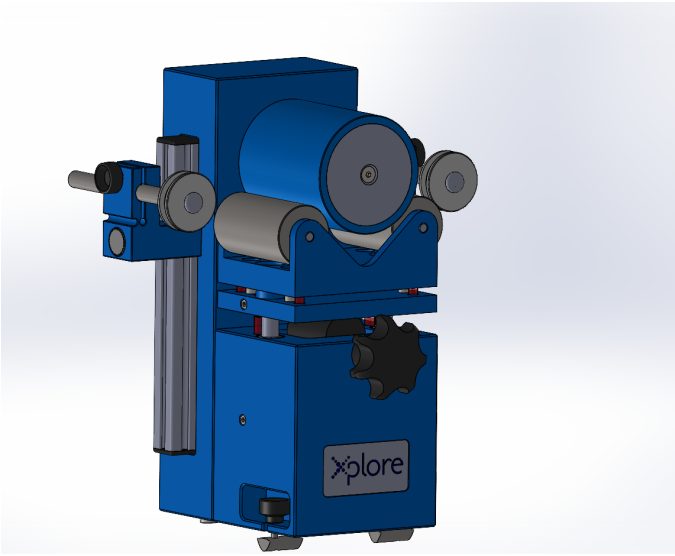
The water bath has enough cooling capacity, and is equipped with an inlet and outlet connector, where a chiller or thermostat can be attached. The filament is dried with compressed air which can be connected at the bottom of the filament dryer.
As a last line of defence, the laser unit checks the diameter of the 3D filament and provides data to the Filament Drawing Godet. It becomes handy when the diameter of the filament, tends to travel to the limits of its internationally accepted tolerance. The Take-up Winder unit will properly wind the newborn 3D filament onto a standardised industrial bobbin for a possible subsequent analysing step or to be fed into a granulator for recycling steps or other compounding purposes.
The 3D FL can produce accurate filaments of FDM typical Polymer matrixes from a minimum of 500 grams of material with a wide range of line speeds, ensuring the generation of fast R&D sample material for subsequent testing or production purposes. If you do not need to produce a bobbin, such as when feeding the 3D filament directly into a 3D printer, the winding section can be omitted.
The 3D FL can be easily added to our latest MC 15 HT and MC 40 micro compounders. The 3D FL is also backwards compatible with earlier (legacy) models of MC 15 compounders, designed by Xplore.



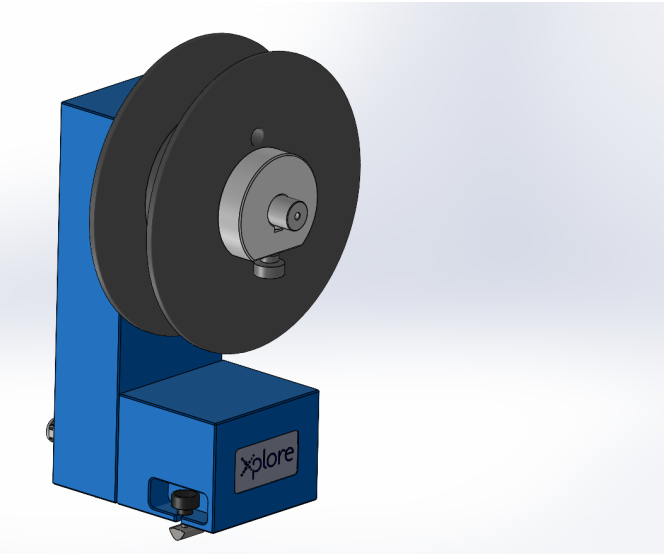
Filament Dryer



Laser Measurement



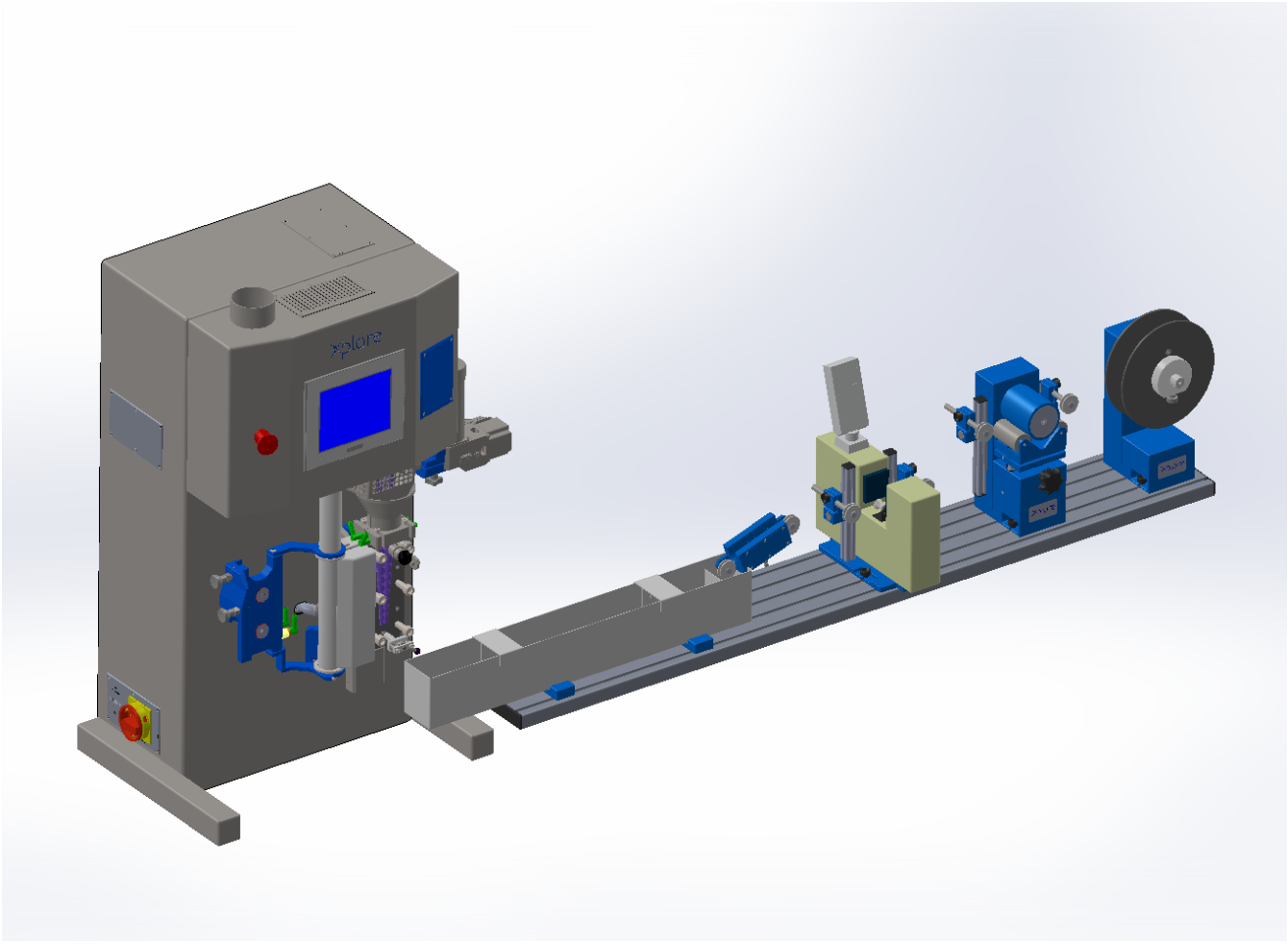
Filament Drawing Godet



3D Take-up Winder

Benefits:

- Possibility to fast screen 3D filaments of different compositions with small amounts of materials
- Enables you to conduct feasibility studies in a quick and efficient manner
- Suitable for the typical FDM materials e.g. PLA, ABS and low viscous polymers like PA and so on
- Wide range of line speed ranges possible
- Winds the filament on a standard industrial bobbin
- Can be retrofitted onto an Xplore MC 15 legacy Micro-compounder
- Saves costs and time



Technical Specifications:

- Fits on any Xplore MC 15 (HT), MC 40 compounders or other R&D extruder setups
- Temperature controlled filament die to minimise die-exit filament resonance
- Two die diameters available, to obtain ø1,75 mm or ø2,85 mm filament
- Approximate weight 3D filament Line 12 kg
- Incl. water bath connections available for either heating or cooling
- Optional dedicated table setup
- Supply voltage: 208 - 240 V AC, 50/60 Hz

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