

**Hot Melt Extrusion  
Downstream Equipment  
for pharma grade polymers**

**Hot melt extrusion** is an ideal manufacturing technique for preparing several types of dosage forms and drug delivery systems. It offers numerous advantages: the absence of solvents, few processing steps, continuous operation, and the possibility of a solid formulation via controlled and improved diffusion.

The extruder is usually combined with different types of downstream supplementary equipment, in order to obtain extrusion-based production lines that are capable of manufacturing a variety of solid dosage forms (pellets, tablets, etc.).

CILYX has developed a variety of supplementary downstream equipment for various pharmaceutical applications, **from the laboratory to large-scale production**: precision cutting and calibration systems (pelletizers), ring-welding solutions, visual inspection etc.

## Precision cutters & pelletizers

Cutting of an implant is a crucial step, and smooth cutting surfaces depend greatly on polymer formulation and cutting method.

CILYX has developed both horizontal and vertical compact pelletizers. Both systems are configurable according to specific requirements.



Placed just after the die of the Hot Melt Extruder, the precision pelletizer is a compact solution that allows precision calibration of polymer filaments and cutting of polymer-based drug delivery systems like implants, subcutaneous implants, strands or pellets.

- + **Main features:** calibration laser, rotary or linear blades, adjustable cutters, up to 600 cuts/min.

### TECHNICAL SPECIFICATIONS

<b>Line speed</b>	Max. 18m/min
<b>Cutting Speed</b>	Max. 600 cuts/min
<b>Nominal Diameter</b>	1.0 mm – 6 mm
<b>Nominal length</b>	1 mm – 200 mm
<b>Diameter Accuracy</b>	3% ± 0.01 mm
<b>Length Accuracy</b>	1% ± 0.1 mm
<b>Belt Length</b>	350mm (option 700mm, 1200mm)

## MicroCut – Precision calibration and cutting machine for pharmaceutical micro-implants

New drug delivery systems, such as **ocular micro-implants or subcutaneous implants**, require precise production with tight tolerances for the diameter and length of **polymer strands**. The **MicroCut post-extrusion system** is the next generation of instruments for the **precise calibration** of polymer strands and cutting them into well-defined micro-implants. Suitable for a variety of polymer formulations and application areas, the **MicroCut post-extrusion system** is a **highly modular** instrument that can be adjusted to meet a **wide range of product specifications**.



- + **Main features:** Lab or Pro-versions (from R&D to commercial manufacturing), Several options of stretching mechanisms, Rotary or linear cutter, 1D or 2D calibration sensor, Different collection systems, Complete IQ/OQ documentation, GMP & 21 CFR part 11 compliance.

### TECHNICAL SPECIFICATIONS

<b>Line speed</b>	Max. 12 m/min
<b>Cutting speed</b>	Max. 600 cuts/min
<b>Nominal diameter</b>	0.2 mm – 2.0 mm
<b>Nominal length</b>	1 mm – 40 mm
<b>Diameter accuracy</b>	3% ± 0.01 mm
<b>Length accuracy</b>	1% ± 0.1 mm
<b>Belt Length</b>	150mm (option 250mm)

**CILYX** is a Belgian engineering company specializing in the **development and integration of advanced special machines** and production systems. Founded in 2009, it has expanded its market share in the pharmaceutical sector by developing various innovative solutions. In particular, **CILYX** has developed key competencies in the **manufacturing of pharmaceutical implants, such as intravaginal rings and micro-ophthalmic implants.**

## Scalable polymer welding equipment

### Semi-automated unit

The P-WELD unit is a **semi-automated scalable welding equipment** used during the formulation phases and the manufacturing process development phase of polymer-based drug delivery systems such as intravaginal rings (IVRs).



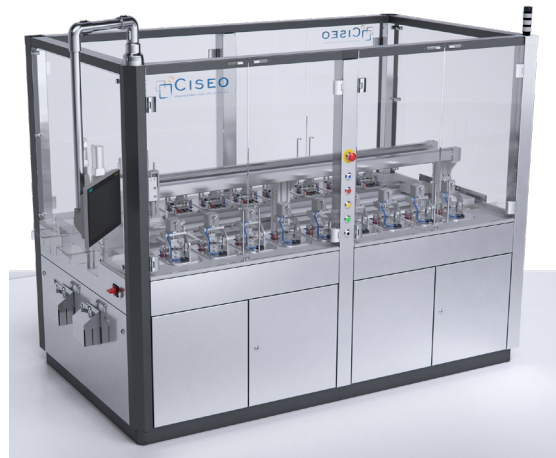
- Main features:** laboratory scale, compact, easy to use, cGMP compliant, suitable for research phases up to the clinical phase III.

### TECHNICAL SPECIFICATIONS

<b>Cycle Time</b>	Adjustable
<b>Welding Temperature</b>	Adjustable from 50 to 150°C
<b>Strands length</b>	150 - 170 mm
<b>Strands diameter</b>	~4 mm
<b>Materials</b>	TPU, EVA, etc.

## Full-scale cGMP welding line for intravaginal rings (IVRs)

The P-WELD Automated Line is a **unique high speed welding line** answering the crucial need and difficult challenge of **welding polymer strands** used for intravaginal rings (IVRs).



- Main features:** high speed welding, fully automated, integrated quality control, cGMP compliant, adjustable process parameters, configurable machine throughput, easy to use, suitable for clinical phases III & full commercial phase.
- Additional visual inspection module:** With sophisticated algorithms and high-resolution cameras, our optional artificial vision module offers a complete and rapid inspection of each ring produced in a completely integrated solution with our production line. It provides reliable detection and sorting of defects like contaminants, inclusions, incomplete welding, skin tears, ovality, flashes etc.

### TECHNICAL SPECIFICATIONS

<b>Line Throughput</b>	Scalable - up to 750 pieces per hour
<b>Welding temperature</b>	Adjustable from 50 to 150°C
<b>Strands length</b>	150 - 170 mm
<b>Strands diameter</b>	~4 mm
<b>Materials</b>	TPU, EVA, etc.



CILYX designs, develops and integrates, in close collaboration with its customers, **special machines and tailor-made production equipment** that meet specific needs. Thanks to its experience and knowledge of the pharmaceutical and biotech sectors, **CILYX adapts its solutions to your requirements.**

CILYX is located in the Liège Science Park, Belgium, a stone's throw from the University. CILYX has important infrastructures dedicated to the development of complex production equipment. The company has a team of 85 people, including more than 70 engineers and specialized technicians. CILYX is active in several international markets.



## CILYX

Liège Science Park  
Rue Louis Plescia, 7 | 4102 Seraing | Belgium  
sales@cilyx.eu | tel : +32 4 240 14 25

[www.cilyx.eu](http://www.cilyx.eu)

