





PROPOR TFF Hollow Fibre Filtration Pre-Launch Primer

PROPOR TFF Pre-Launch Primer Agenda

- Review of objectives
- Basic product range familiarisation
- Typical application types
- Value propositions
- Support & documentation
- Launch activities timeline
- Q&A



PROPOR TFF Primer

What you should know after today!

- Basic PROPOR TFF range composition
- General appropriate application types
- Who to contact in the event of an enquiry?
- What happens next?



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Hollow Fibre Product Range & Applications

- New Parker domnick hunter range of hollow fibre tangential flow filtration (TFF) modules
- Intended for use in biologic manufacturing applications
- Three distinct product types:
 - Single-use
 - Reusable
 - Autoclaveable
- All product types available with both microfiltration and ultrafiltration membrane cut-offs



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Hollow Fibre Product Range & Applications

- Modules supplied to Parker domnick hunter under private label agreement by Watersep Bioseparations
- 75 years of cross-flow experience
- Modules produced using proprietary high-performance modified PES membrane chemistry, developed and manufactured in-house.
- Provision of extensive support to Parker domnick hunter for progression of opportunities



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Hollow Fibre Product Range Overview

All products utilize high-flux, low-fouling and low-binding modified PES membrane

Membrane surface area from 17cm² to 10M²

Available in 12", 24" & 41" fibre lengths and seven different formats (hollow fibre number / module diameter):

Lab, LabPlus, LabMax, Pilot, PilotPlus, Production & ProductionMax

Ultrafiltration and microfiltration membrane:

3K to 750K MWCO and 0.1µm, 0.2µm & 0.45µm

Available in both 0.5mm and 1.0mm hollow fibre lumen diameters (affects number of hollow fibres)

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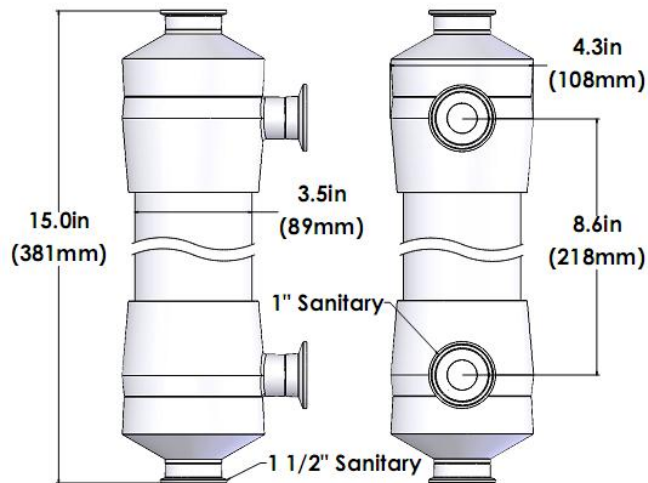
Hollow Fibre Product Range Overview

12", 24" & 41" refer to hollow fibre length, not external module dimensions.

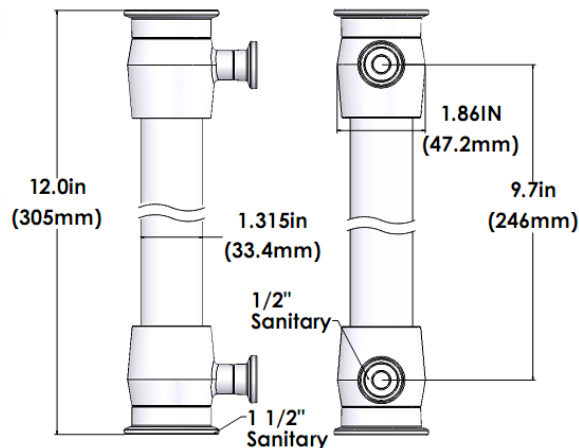
Larger modules constructed using more hollow fibres, therefore allowing higher inlet flow rates.

Specific part dimensions & connection types detailed in marketing literature.

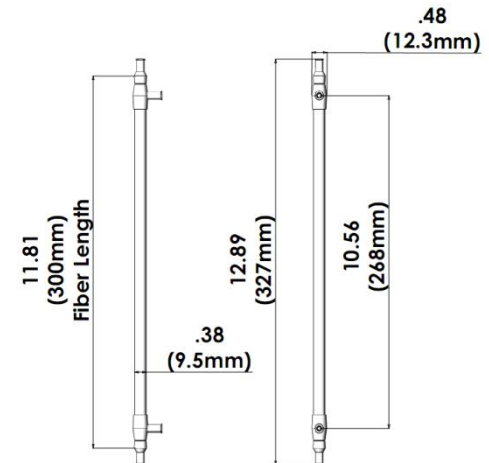
Production



PilotPlus



Lab / LabPlus



Product Dimensions & Membrane Area

Cartridge Type	Number of Fibres*	12 inch Fibre Length		24 inch Fibre Length		41 inch Fibre length	
		EFA (cm ²)	Nominal Module Dimensions (dia. x length) (mm)	EFA (cm ²)	Nominal Module Dimensions (dia. x length) (mm)	EFA (cm ²)	Nominal Module Dimensions (dia. x length) (mm)
Lab	2 or 4	17 cm ²	9 x 300	36 cm ²	9 x 600	N/A	N/A
LabPlus	6 or 12	52 cm ²	9 x 300	107 cm ²	9 x 600	N/A	N/A
LabMax	18 or 36	155 cm ²	13 x 312	320 cm ²	13 x 605	580 cm ²	13 x 1062
Pilot	54 or 108	444 cm ²	33 x 311	940 cm ²	33 x 597	0.17 m ²	33 x 1061
PilotPlus	160 or 320	0.13 m ²	33 x 305	0.20 m ²	33 x 597	0.50 m ²	33 x 1054
Production	1600 or 3200	1.25 m ²	89 x 381	2.72 m ²	89 x 673	5.00 m ²	89 x 1130
ProductionMax	3200 or 6400	N/A	N/A	5.00 m ²	117 x 724	10.00 m ²	117 x 1181

* Dictated by fibre lumen diameter (1.0 mm / 0.5 mm).

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Value Proposition

- All products utilize high-flux, low-fouling, modified PES membrane for exceptional performance.
- Most unique value propositions exist around single-use product range...
 - Minimal / no flush required
 - No set-up, sanitization, cleaning, storage, NWP test time.
 - Extremely well-suited to incorporation into single-use automated systems





SINGLE-USE

Ready to use cross-flow filtration - no pre-rinse required

Up to 80x reduction in extractables compared to glycerin conditioned membranes

High-flux, low-fouling modified PES membrane for exceptional performance

Plug-and-play - connect, use and discard

No cleaning required

Self-contained hollow fibre filters - no hardware - no installation

100% integrity tested

Sterilizable by gamma-irradiation



REUSABLE

High-flux, low-fouling modified PES membrane for exceptional performance

Self-contained hollow fibre filters - no hardware - no installation

100% integrity tested

Robust, caustic-stable materials of construction allow repeated chemical cleaning, sanitization and storage cycles



AUTOCLAVEABLE

Ready to use cross-flow filtration - no pre-rinse required

Up to 80x reduction in extractables compared to glycerin conditioned membranes

High-flux, low-fouling modified PES membrane for exceptional performance

Plug-and-play - connect, use and discard

No cleaning required

Self-contained hollow fibre filters - no hardware - no installation

100% integrity tested

Able to be sterilized by autoclaving

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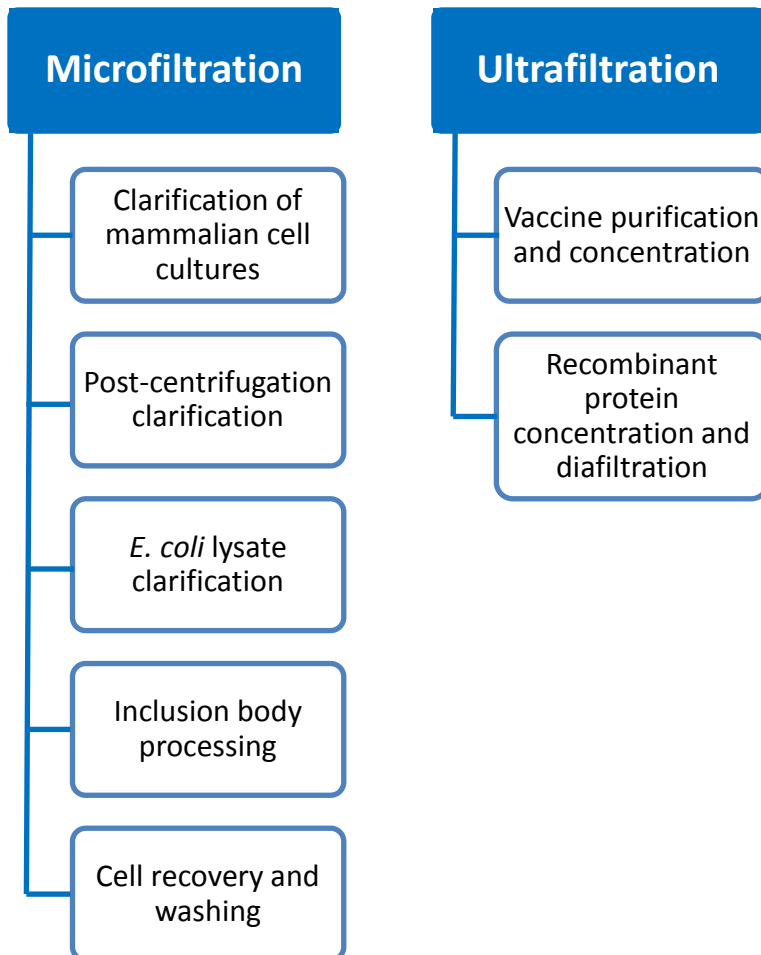
Competition

- Main, direct competition from GE Healthcare and Spectrum
 - Better quality than spectrum
 - Better membrane performance than GE
- Competition from cassette manufacturers primarily in ultrafiltration applications
 - Single-use format should provide time and cost savings versus cassettes



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Typical Applications



For upstream applications, higher percentage of applications for hollow fibre filters are likely to be microfiltration

Hollow fibres are extremely capable of handling process streams with high solids content, therefore very good for upstream processing

Can also be used for ultrafiltration applications but also need to compete with cassettes in these areas

Refer to TFF Playbook Volume 1 for further detail

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Who to contact?

- If enquiries received prior to full launch session then please contact...
 - Nick Hutchinson
 - Andy Kelly
- Approximately 300 registered attendees for webinar so far.
- Full support available for progression of opportunities
- Worth contacting any accounts using PureTec to seed additional opportunities



Pdh Hollow-Fibre Process Map (Pre-Order)

— Sales & Commercial

— Technical Support

— Marketing Support

— Quality Enquiries

End User

Sales Company

- Initial opportunity identification & assessment
- Primary customer contact

BDM Team

- Initial opportunity identification & assessment
- Application data collection & initial evaluation
- Co-ordination between Sales Company & Division

**Parker domnick
hunter**

Technical Support

- Detailed technical application assessment
- Trial coordination
- General technical enquiries

Marketing Dept

- Literature
- Event support
- Product management

Quality Dept

- Customer quality questionnaires

**Quote Cell &
Pricing**

- Quotes & lead-times
- Order support
 - Pricing

Item Creation

- Item creation

Procurement

- Order coordination

WaterSep

Bengt Persson

- Applications
- Pricing
- Sales
- Marketing
- Quality enquiries

Attila Herczeg

- Operational enquiries
- Quality enquiries

Nancy Barton

- Orders
- Delivery

Pdh Hollow-Fibre Process Map (Post-Order)

— Sales & Commercial

— Technical Support

— Marketing Support

— Quality Enquiries

End User

**Parker domnick
hunter**

WaterSep

Technical Support

- General technical enquiries
- Troubleshooting
- Returned product investigations

Marketing Dept

- Literature
- Event support
- Product management

Quality Dept & Supplier Quality

- Customer quality questionnaires
- Quality investigations

Customer Services

- Orders
- Delivery

Bengt Persson

- Applications
- Pricing
- Sales
- Marketing
- Quality enquiries

Attila Herczeg

- Quality enquiries
- Operational enquiries

Nancy Barton

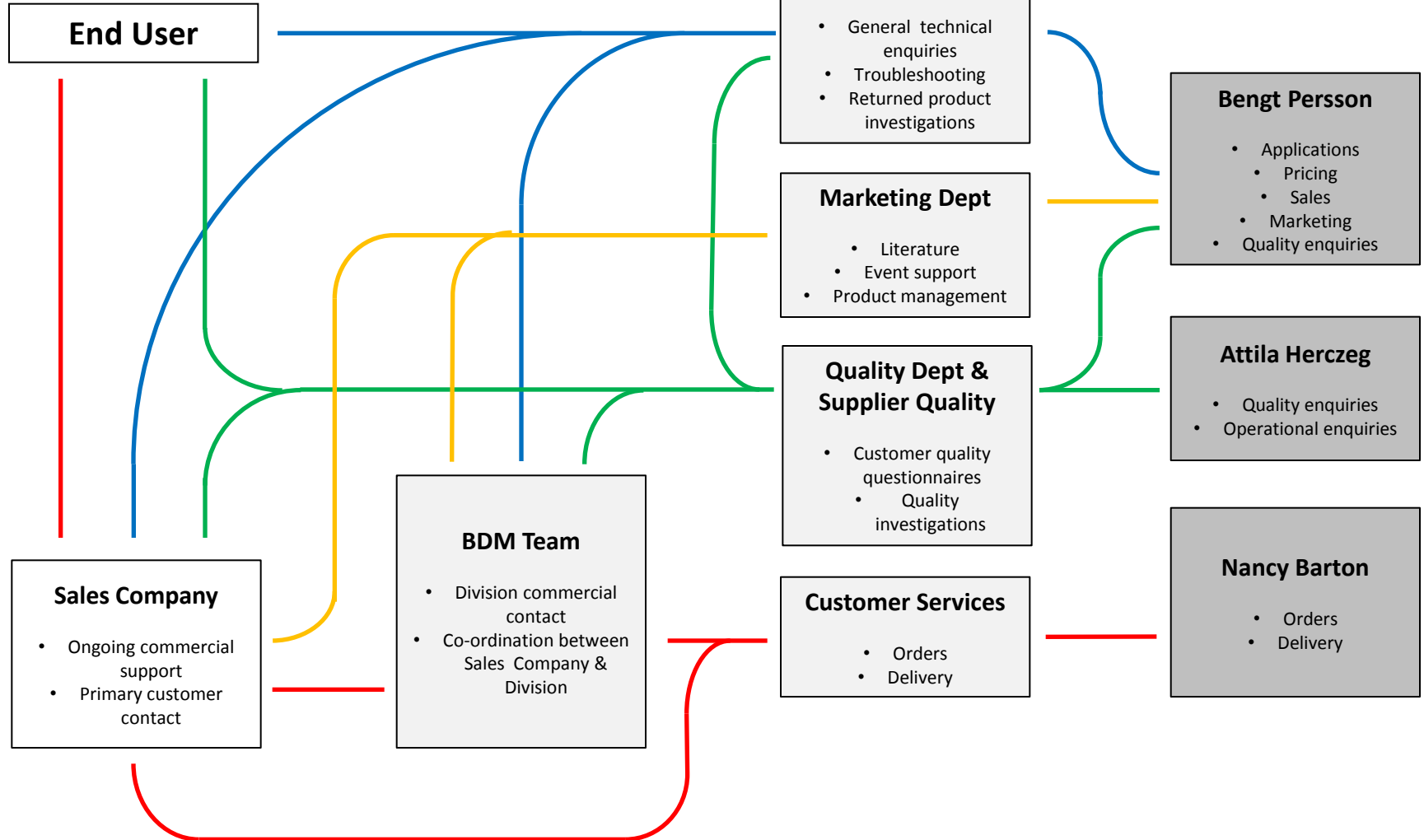
- Orders
- Delivery

Sales Company

- Ongoing commercial support
- Primary customer contact

BDM Team

- Division commercial contact
- Co-ordination between Sales Company & Division



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Support Documentation

- 3 x Datasheet
- 3 x Validation Guide
- Product Specific Certificates / IOMI documents
- PROPOR TFF Overview Guide
- PROPOR TFF Playbook
- Technical Application Note (all products)
- Product Bulletin (single use)
- General Hollow Fibre SOP
- Cleaning & Storage SOP
- Crossflow Filter User Guide



Webinar – Aims & Objectives

“Best Practices for Developing Single-Use TFF Steps for Bioprocessing”

- Understand the benefits of single-use TFF technologies
- Learn how to correctly select, size and scale TFF filters for single-use applications
- Learn how to determine the optimum single-use TFF automation strategy
- Understand how single-use sensor technology can be applied to enhance process control

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Launch Activities Timeline

- Internal Division Support Training
Wednesday 19th & Thursday 20th April
- Partial documentation package made live (datasheets, overview guide)
- PROPOR TFF Primer
Monday 18th May
- Webinar “Best Practices for Developing Single-Use TFF Steps for Bioprocessing”
Wednesday 20th May
- Internal systems and full documentation package made live
- EMEA Product Launch Session
Wednesday 24th to Friday 26th June
- NA Product Launch Session
August (Specific dates TBC)



The background of the slide features a close-up, shallow depth-of-field photograph of medical equipment. Several white, flexible tubes or cables are visible, some connected to circular ports or connectors. The lighting is soft and clinical. Overlaid on this image is the text 'To be continued...' in a large, bold, black sans-serif font. On the right side of the slide, there is a vertical bar composed of four distinct colored segments: teal, orange, blue, and yellow. A solid yellow horizontal bar runs across the bottom of the slide.

To be continued...



Any Questions?