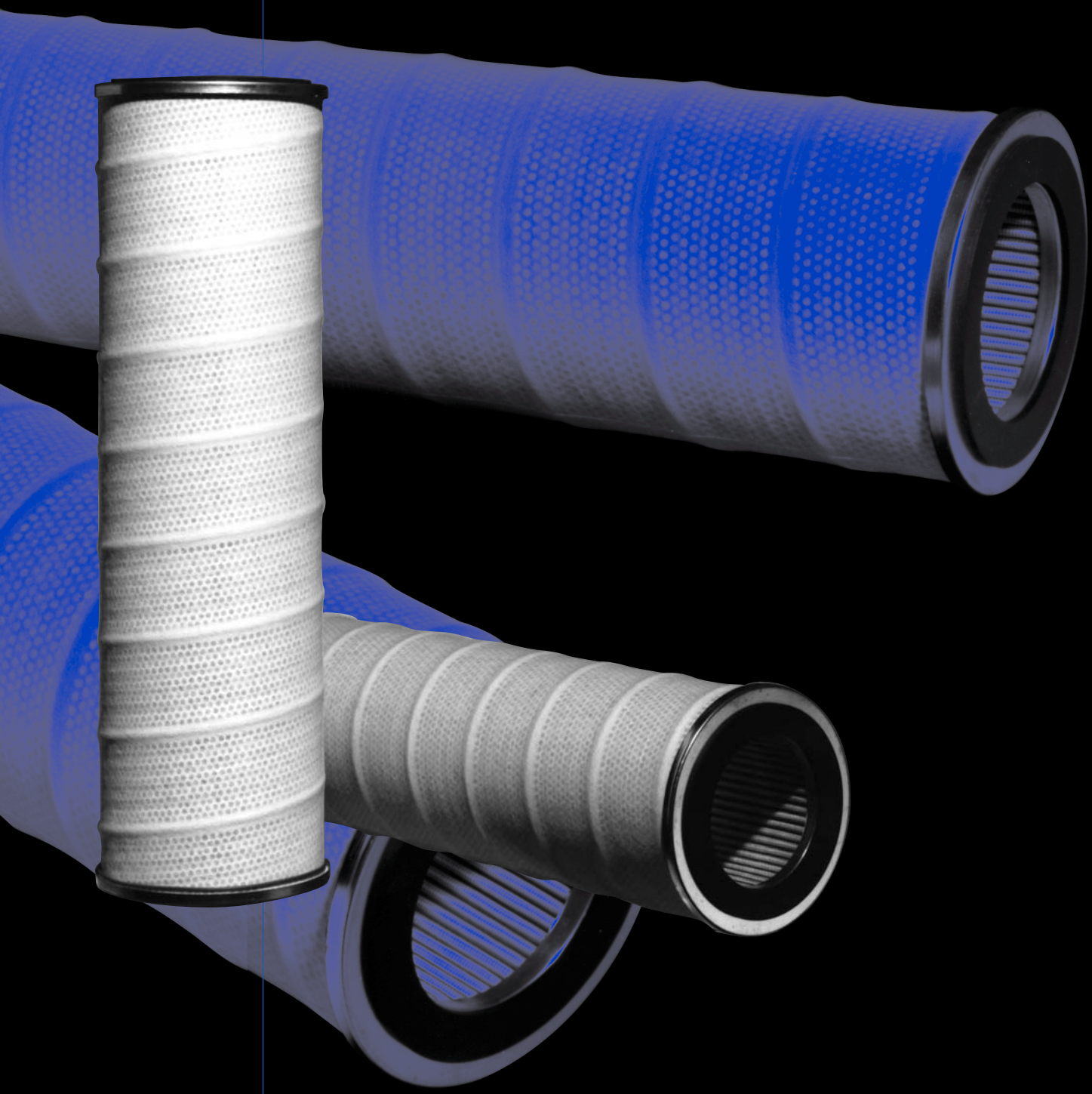
PALL

Fuels and Chemicals

PhaseSep® FR1 Liquid/Liquid Coalescer

Retrofits Facet Tie-Rod Mount Style Elements



*Filtration. Separation. Solution.*SM

PhaseSep® FR1 Liquid/Liquid Coalescer

Retrofits Facet* Tie-Rod Mount Style Elements

Introduction

Pall's PhaseSep® FR1 Series liquid / liquid coalescer is designed to directly retrofit Facet International coalescer vessels designed to hold tie-rod mount style liquid / liquid coalescers.

The Pall PhaseSep FR1 system is a multiple stage unit starting with preconditioning of the fluid with a Pall particulate filter followed by the PhaseSep FR1 coalescer. The preconditioning filter removes particulate matter to prolong the service life of the PhaseSep FR1 coalescer and initiates coalescence of the dispersed phase.

Pall preconditioning particulate filters are available in numerous configurations that can fit directly into your current prefilter housing. If you do not have a prefilter installed, a system can be provided by Pall.

The PhaseSep FR1 Series coalescer utilizes the same proprietary PhaseSep medium that Pall employs when it sells new liquid / liquid coalescer systems. The FR1 series product allows customers to adopt Pall coalescer technology without the need to purchase new capital equipment.

PhaseSep FR1 Coalescers

Dimensions

6 inch / 15.24 cm	Nominal Diameter
20 inch / 50.8 cm	Nominal Length

Materials of Construction

Item	Materials
End Caps / Support Cage	316 Stainless Steel
Support / Drainage Layers	316L Stainless Steel
Medium	Fluoropolymer Construction
Gasket	Viton A**

Retrofit Options

The PhaseSep FR1 coalescer can retrofit Facet tie-rod mount style coalescers such as:

- CA Series 3 Products
- CB Series Products
- CC Series Products

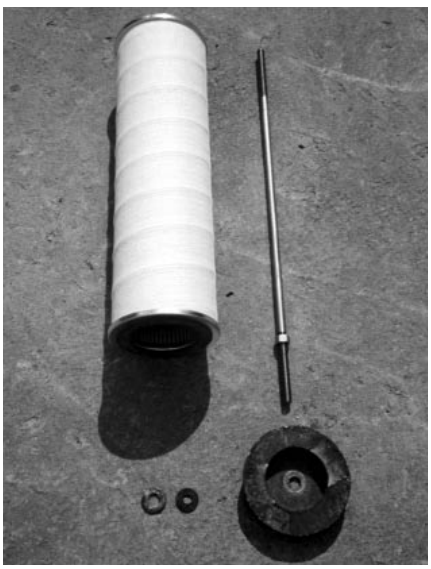


Figure 1: *Pall FR1 Coalescer and Tie-Rod. Current Facet Yoke.*

* Facet is a registered trademark of FPG Acquisition Company.
**Trademark of E.I. du Pont de Nemours and Company

Feature	Advantage	Benefit
Specially formulated fluoropolymer medium	Wide chemical and temperature compatibility	Better to withstand upsets in pH and temperature
	Can separate liquids that have low interfacial tension	Eliminates need for emulsion breaking chemicals
	Coalescence performance not impaired by the presence of surfactants or corrosion inhibitors	Excellent fluid quality Continuous protection of downstream equipment
High void volume medium in prefilters and PhaseSep® FR1 coalescers	Long service life	Lower separation costs
Product directly retrofits current facet tie-rod style housings holding CA, CB and CC style elements	No need to purchase new capital equipment	Improved liquid/liquid separations with no capital expenditures

Typical Applications

- Separation of pyrolysis gas from quench water in ethylene plants
- Separation of oil from water

PhaseSep FR1 Liquid/Liquid Coalescers:

- Remove dispersed liquid contamination to a level consistently less than 20 ppmw oil and grease*
- Handle dispersions with inlet liquid contaminant concentrations as high as 10%
- Separate dispersions with interfacial tensions as low as 0.5 dyne/cm

* By Infrared Method (EPA413.2)

Pall Corporation must review each application for the PhaseSep FR1 Liquid/Liquid Coalescer for technical feasibility. It must be determined if enough coalescer area is possible and if the existing Facet housing is long enough to prevent the two liquid phases from recombining once the emulsion is broken.

If appropriate, two or more 20 inch long Pall PhaseSep FR1 style coalescers can be coupled together with a Pall supplied coupler to increase the amount of coalescer area in the housing.

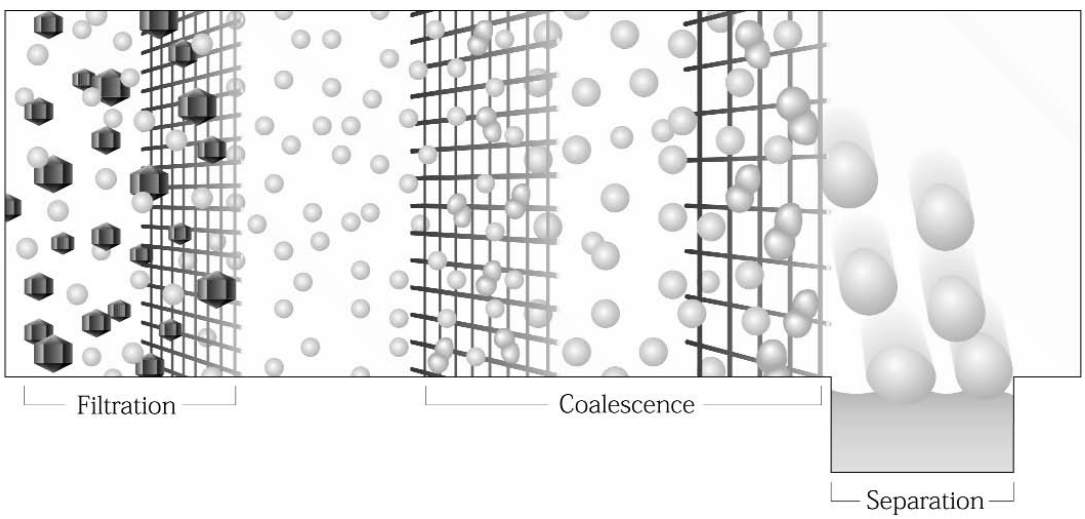


Figure 2:
Filtration: *Solid particles are removed from the fluid stream by the filter medium.*

Coalescence: *Small droplets are merged into larger ones as they pass through several layers of filter media in the coalescer.*

Separation: *Gravity takes effect, the large droplets are separated from the product fluid stream.*

Installation

Once the application has been approved as suitable and the vessel size is determined to be large enough by a Pall scientist:

1. The current prefilter elements and the current Facet coalescers are removed from service
2. If required, the existing coalescer tie-rods are removed using the Pall wrench provided and Pall tie-rods installed
3. Pall prefilters are installed in current housing or in new Pall prefilter vessel
4. Pall PhaseSep® FR1 Coalescers installed

In the coalescer housing, the liquid/liquid emulsion enters the PhaseSep FR1 liquid/liquid coalescing element and flows inside to outside. Dispersed phase droplets suspended in the continuous phase come together, or coalesce, as the mixture moves through the coalescer. The large coalesced droplets of the dispersed phase separate by gravity in the horizontal housing and are removed.

The PhaseSep FR1 coalescer can break emulsions by removing a dispersed, non-dissolved liquid phase from a bulk liquid. It cannot remove dissolved liquids from another liquid.

Liquid/Liquid Coalescer

Compatibility

To determine if the PhaseSep FR1 coalescing element is compatible with your process fluid, please contact your Pall distributor or Pall applications engineer.

Operating Characteristics

Maximum Temperature*: 300°F / 149°C
Initial Pressure Drop: 2 psid / 137 m bar d
Recommended Maximum Pressure Drop:
15 psid / 1 bar d

* With chemically compatible fluids.

Ordering Information

Part Number	Description	Nominal Diameter Inches/cm	Nominal Length Inches/cm
FR1L620EH	PhaseSep FR Coalescer	6/15.24	20/50.8
FR20L	20″ Long 316 Stainless Steel tie-rod	—	20/50.8
FR1T	Wrench to remove current coalescer hardware		

[1] Retrofit tie-rods with metric fittings also available.
[2] Wrench to remove existing tie-rods with metric fittings also available.
[3] Longer retrofit tie-rods also available.

Figure 3: Installation of Pall PhaseSep FR1 Coalescers onto Pall Retrofit Tie-Rods.

Figure 4: Pall PhaseSep FR1 Coalescers Installed in a Bottom Mount Style Housing.

Pall Corporation – A Powerful Resource For Control – Protection and Teamwork

Pall Corporation brings over 50 years of filtration and separations experience to your plant's processes. With the industry's widest range of advanced products, Pall can design a system specifically for your plant, based on a thorough evaluation of your needs.

You'll receive technical consultation and support from our Scientific and Laboratory Services Department (SLS). This is a network of some 400 scientists and engineers working from more than 30 Pall laboratories worldwide.

Pall continues to develop new products and methods to advance state-of-the-art phase separation. No other company offers such a strong core competency in coalescing technology to help you reduce operating and maintenance costs through improved product control, plant protection and teamwork.

Call the Pall Corporation Fuels and Chemicals division to determine if the PhaseSep® FR1 coalescer can retrofit your current vessel and to order a set of coalescers to evaluate.

PALL Fuels and Chemicals

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Reorder Code. GDS 101