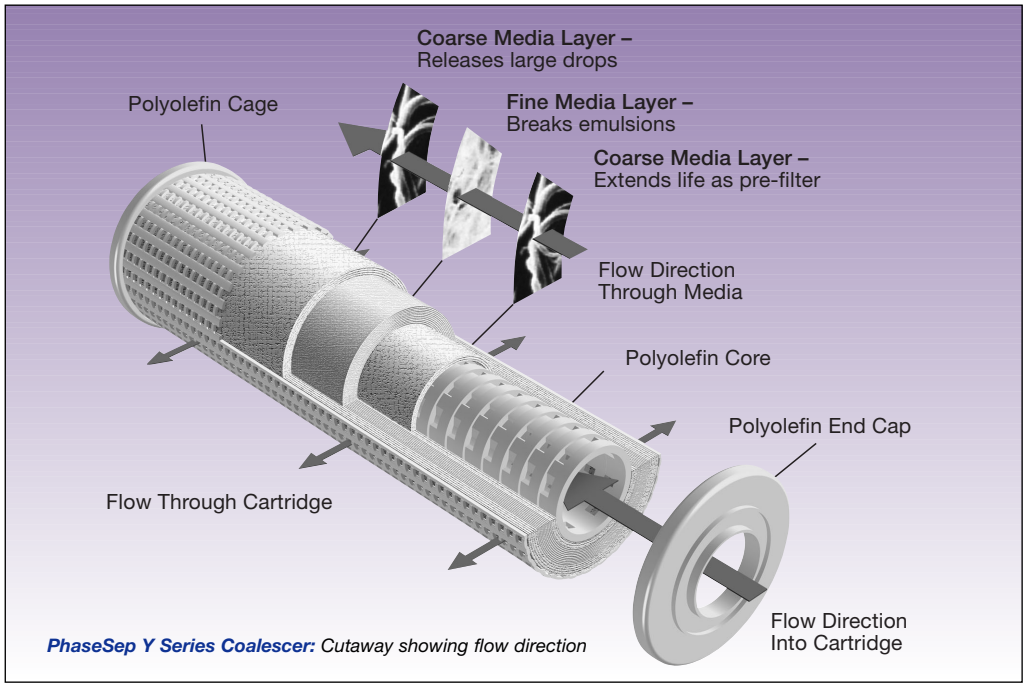
coalescer

PhaseSep® Y Series Liquid/Liquid Coalescer

EFFECTIVELY SEPARATES EMULSIONS



PhaseSep Y Series Coalescer: *Cutaway showing flow direction*

Introduction

The Pall **PhaseSep**® Y Series Coalescer is the latest member of the **PhaseSep** coalescer family and is a high efficiency separation cartridge that is constructed entirely of FDA listed polyolefin material. This allows the **PhaseSep** Y series coalescer to be used in a wide range of liquid/ liquid separations in the chemical, flavour & fragrance, and biotechnology industries where metal is not compatible and/or where FDA listed materials are required.

The coalescer media contains a three layered tapered pore construction. The emulsion first enters at the inside of the cartridge and passes through a coarse pre-filter layer to extend the service life. The fluid then encounters a fine media layer that initiates the coalescing process starting the enlargement of the droplets. The coalescing process is completed by a coarse media layer that maximizes the coalesced drop size before the fluid departs from the outside layer of the coalescer cartridge.

The presence of difficult to separate emulsions can be a costly problem in the chemical, flavour & fragrance, and biotechnology industries. Liquid contaminants can cause final products to be off-specification, deactivate expensive catalysts, foul contactor and stripping trays, lead to corrosion and delays in downstream storage tanks, and increase the costs for wastewater treatment.

Breaking stable emulsions can be a difficult task depending on the physical properties of the oil, water, and surfactant system.

Important parameters in determining the ease of separating emulsions are the interfacial tension (IFT), difference in density, and viscosity. The IFT is a good way to assess the stability of an emulsion and is a measure of how much energy is required to create additional water /oil surface area. For very stable emulsions, the IFT can be very low and conventional glass fibre coalescers can lose their efficiency when the IFT reaches below 20 dyne/cm.

Compatibility is also a key issue when selecting a coalescer type. Pall offers a wide range of coalescers including various polymers and fluoropolymers.

Materials of Construction

Item	Materials
End Caps/Support Cage	Polyolefin
Support/Drainage Layers	Polyolefin
Medium	Polyolefin
Gasket	Ethylene-Propylene-Diene (EPDM)*

** also available in Buna N, Viton A, Ethylene Propylene (EPM), and Silicone*

Feature	Advantage	Benefit
• All plyolefin construction	• Wide chemical and low temperature compatibility	• Better to withstand upsets in pH and temperature
	• Coalescense performance not impaired by presence of surfactants	• Eliminates need for emulsion breaking chemicals
• Tapered pore structure	• Can separate liquids that have low interfacial tension	• Excellent fluid quality
• High void volume medium	• Long service life	• Enhanced protection of downstream equipment
• FDA listed materials	• Meets government regulations	• Lower separation costs
		• Allows improved emulsion separation in flavour & fragrance/biotech industries

Typical Applications

- Separation of oil from ammonia
- Separation of oil from urea
- Separation of oil from acid streams
- Separation of oil from caustic streams
- Separation of citric oils from alcohol-water
- Separation of organics from acid/caustic pharmaceutical extractants

Performance of PhaseSep Y Series Coalescers:

- Remove liquid contamination to a level of ≤5 ppmw based on gravimetric analysis
- Handle inlet dispersed liquid contaminant concentrations as high as 10%
- Separate emulsions with interfacial tensions as low as 0.5 dyne/cm

Note: each application for the PhaseSep Y Series L/L Coalescer should be reviewed by Pall Corporation for technical feasibility.

Description

The Pall pre-filter and horizontal liquid/liquid coalescer system is depicted on the last page. The first stage consists of a pre-filter housing that is used to remove solids from the inlet emulsion stream to protect the coalescer and ensure long service life. The pre-filter also functions as a pre-coalescer and starts the fine droplets in the emulsion on their route to forming larger intermediate drops that continue to enlarge in the coalescer medium.

In the coalescer housing, the liquid/liquid emulsion enters the **PhaseSep** Y series coalescing element and flows inside to outside. Dispersed phase droplets suspended in the continuous phase merge together in the fiber medium, or coalesce, as the emulsion moves through the coalescer medium.

The large coalesced droplets of the dispersed phase leave the coalescer cartridges and are separated by the difference in density between the two phases in the settling zone of the horizontal housing.

The drops collect in a sump where an interface level is monitored, typically with automated level control and valves. Depending on the difference in the density between the two phases, the sump can be located on the top or the bottom of the coalescer housing.

Compatibility

The PhaseSep Y series coalescer is compatible with many corrosive solvents encountered in the chemical, flavour & fragrance, and biotechnology industries including ammonia, urea, acids, caustics, brines, amines, alcohols, and many other organic solvents. For compatibility information with a specific chemical, please contact your local Pall office.

Ordering Information - Coalescer

Part Number	Description	Nominal Diameter	Nominal Length*
LCY2Y2YJ	PhaseSep Y Series L/L Coalescer	2¾ in. (70 mm)	20 in. (510 mm)

** Stackable for extended lengths*

Ordering Information - Housing

Part Number	No. Coalescer	Rated Flow per Housing	Nominal Housing Diameter	Inlet/Outlet Flange Diameter
		(gpm/lpm)	(in/mm)	(in/mm)
3HAQLS0501F ■ – ● – ▲ ▲ ▲ – 1	3	16/60	5/127	1/25.4
8HAQLS1202F ■ – ● – ▲ ▲ ▲ – 1	8	42/160	12/305	2/50.8
15HAQLS2002F ■ – ● – ▲ ▲ ▲ – 1	15	80/300	20/508	2/50.8
35HAQLS2804F ■ – ● – ▲ ▲ ▲ – 1	35	185/700	28/711	4/101.6

Code ■	ASME B16.5 Flanges
1	150 #
3	300 #

Code ▲ ▲ ▲	Pressure Rating for Carbon Steel Vessels
285	285 psig (19.7 barg)
740	740 psig (51.0 barg)

Code ●	Housing Metallurgy
None	Carbon Steel Vessel, 304 Stainless Steel Tube Sheet
S3	304L Stainless Steel
S8	304 Stainless Steel
L3	316L Stainless Steel
L8	316 Stainless Steel

Performance Claims and Specifications

Maximum Temperature:	122°F (50°C)
Minimum Temperature:	-40°F (-40°C)
Initial Pressure Drop:	2 psid (0.14 bar)
Recommended Changeout:	15 psid (1.03 bar)
Burst Pressure Drop:	50 psid (3.5 bar)

Pall Corporation

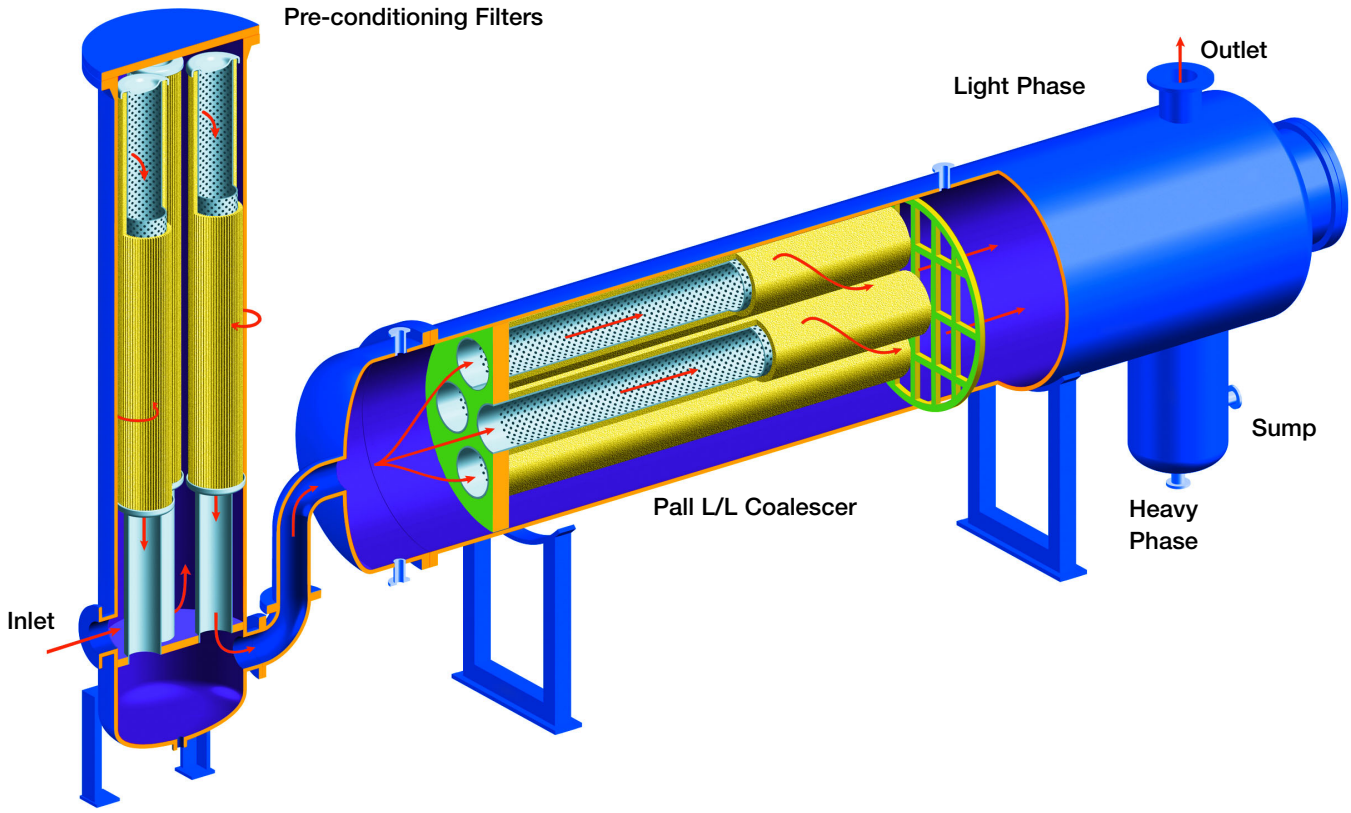
A Powerful Resource For Control Protection and Teamwork

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 over 400 scientists and engineers working from more than 30 Pall laboratories worldwide.

Pall continues to develop new products and methods to advance the state of the art of 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.

To determine if the **PhaseSep** Y series coalescer can help you with your emulsion problems, call the Pall Corporation Fuels and Chemicals Division or visit our web site at www.pall.com.



Liquid/Liquid Coalescer

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