



c o a l e s c e r

## Pall PhaseSep® HE Series Liquid / Liquid Coalescers

For the Most Difficult Emulsions

### Introduction

Pall's PhaseSep HE Series Coalescer is a high efficiency separation cartridge that is designed to handle the toughest emulsions. Constructed with a fluoropolymer medium, Pall PhaseSep HE Series Coalescers can be used in a wide range of liquid / liquid separations in the refinery, chemical, flavor & fragrance, and biotechnology industries. The Pall PhaseSep HE Coalescer should be used for difficult emulsions where improved performance is required.

### Performance of PhaseSep HE Series Coalescers:

- Removes sodium down to  $\leq 1$  ppmw in cumene hydroperoxide
- Decreases sodium to  $< 0.5$  ppmw in refinery products
- Processes inlet dispersed liquid contaminant concentrations as high as 10%
- Separates emulsions with interfacial tensions as low as 0.5 dyne/cm

**Note:** Each application for the PhaseSep HE Series L/L Coalescer should be reviewed by Pall Corporation for technical feasibility.

### Typical Applications

- Separation of caustic from organic peroxides
- Separation of caustic or water from methylene chloride
- Separation of oil from caustic or water streams



*Pall PhaseSep HE Liquid / Liquid Coalescer*

### Coalescer Selection

The presence of difficult-to-separate emulsions can be a costly problem in the refinery, chemical, flavor & 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, result in delays when separation is required 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), density difference, and viscosity. The IFT is a good way to assess the stability of an emulsion, and along with the amount of shear the fluid has experienced, will determine how small the droplets are in the emulsion. For very stable emulsions with an IFT of less than 20 dyne/cm, conventional glass fiber coalescers can lose their efficiency. One final consideration when selecting a coalescer type is compatibility. Pall offers a wide range of coalescers constructed of various polymers and fluoropolymers to meet the needs of industrial applications.

## Materials of Construction

Part Number	Media/ Outer Sleeve	Support Layer/ Core	End Caps	O-ring
LCS4HEHH LCS2HEHH LCS06HEHH	Fluoropolymer	316L Stainless Steel / 304 Stainless Steel	Melt Bonded Fluoropolymer	*Viton <sup>1</sup>
LCS4HEAH LCS2HEAH LCS06HEAH	Fluoropolymer	316L Stainless Steel / 304 Stainless Steel	Epoxy Potted 304 Stainless Steel	*Viton <sup>1</sup>

\* Also available in Buna N, Viton A, Ethylene Propylene (EPM), and Silicone.

<sup>1</sup> Viton is a registered trademark of DuPont Dow Elastomers.

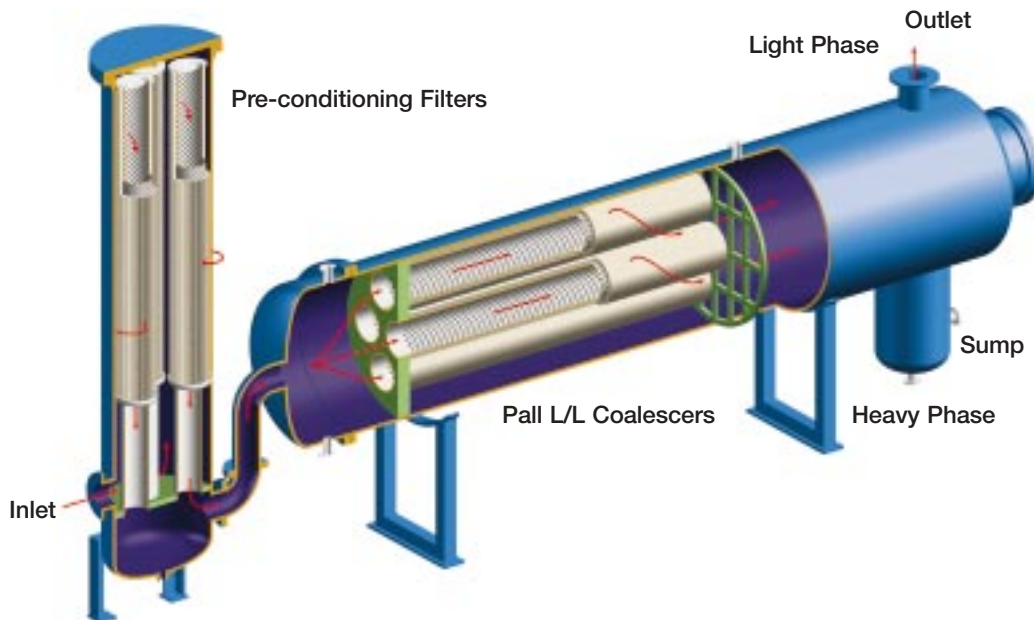
Feature	Advantage	Benefit
Fluoropolymer construction	Wide chemical compatibility	Ability to withstand upsets in pH and aggressive service applications
	Coalescence performance not impaired by presence of surfactants	Eliminates need for emulsion breaking chemicals
Special formulated tapered pore structure	Can separate liquids that have low Interfacial tension	Excellent fluid quality
		Enhanced protection of downstream equipment
High void volume medium	Long service life	Lower separation costs

## Description

The Pall pre-filter and horizontal liquid / liquid coalescer system is depicted below. 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 by initiating the process of combining the finer droplets in the emulsion into intermediate size drops that continue to enlarge in the coalescer medium.

In the coalescer housing, the liquid / liquid emulsion enters the PhaseSep HE series coalescing element and flows inside to outside. Dispersed phase droplets that are suspended in the continuous phase come together, or coalesce, as the emulsion

moves through the fibrous coalescer medium. The coalescer medium has a tapered pore structure that varies from fine to coarse to allow for the growth of the drops. As the large coalesced droplets of the dispersed phase leave the coalescer cartridges, they are separated via density difference between the two phases in the settling zone of the horizontal housing. The drops collect in a sump where automated level control and valves monitor the interface level. The sump can be located on the top or the bottom of the coalescer housing to address specific density differences between the two phases.



## Liquid/Liquid Coalescer

## Compatibility

The PhaseSep HE series coalescer is compatible with many corrosive solvents encountered in the refinery, chemical, flavor & fragrance, and biotechnology industries including cumene hydroperoxide, methylene chloride, ammonia, urea, caustics, amines, alcohols, and many other organic solvents. For compatibility information with a specific chemical, please contact your Pall distributor or Pall applications engineer.

## Performance Claims and Specifications

<b>Maximum Temperature*:</b>	300°F (149°C)
<b>Initial System Pressure Drop:</b>	2 psid (0.14 bar)
<b>Recommended Changeout Pressure Drop:</b>	15 psid (1.03 bar)
<b>Maximum Forward Pressure Drop:</b>	50 psid (3.5 bar)

\* With stainless steel end caps, 160°F (71°C) with fluoropolymer end caps.

## Ordering Information - Coalescer

Part Number	Description	Nominal Diameter	Nominal Length
LCS4HEHH/ LCS4HEAH	PhaseSep HE Series L/L Coalescer	3¾ in. (95.3 mm)	40 in. (1016 mm )
LCS2HEHH/ LCS2HEAH	PhaseSep HE Series L/L Coalescer	3¾ in. (95.3 mm)	20 in. (508 mm )
LCS06HEH/ LCS06HEAH	PhaseSep HE Series L/L Coalescer	2¾ in. (69.9 mm)	6 in. (152.4 mm )

## Pall Corporation: A Powerful Resource For Control, Protection, and Teamwork

Pall Corporation brings more than 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 Scientist and Laboratory Services Department (SLS) — a network of 400 scientists and engineers working from more than 30 Pall laboratories worldwide.

Pall continues to develop new products and methods to raise the bar in phase separation capabilities. 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.

For further information, please contact your local Pall sales office or Pall distributor. Additional information on Pall products and services can be found at [www.pall.com](http://www.pall.com).



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