

Refineries: Application Focus

Caustic Treating

Process Description

Caustic treating is used to upgrade a wide range of liquid fractions from LPG to diesel fuels and heating oils. As the caustic solution (and often a catalyst) mixes with the hydrocarbon feed it either extracts or sweetens mercaptans, depending on the process used. However, the combination of the hydrocarbon and mercaptan rich caustic also forms a very stable emulsion that is difficult to separate, causing significant quantities of caustic carryover in the product. This results in off-specification products due to haze or elevated sodium concentration and loss of caustic. In many cases the entrained caustic is fed to processes where sodium is a poison to the catalyst.

Because the emulsion is so stable, knock-out drums, sand filters and packed vessels are not able to efficiently separate the caustic emulsion from the hydrocarbon streams.

Ensure your caustic treating reliably supports your daily production quotas and downstream process protection needs.



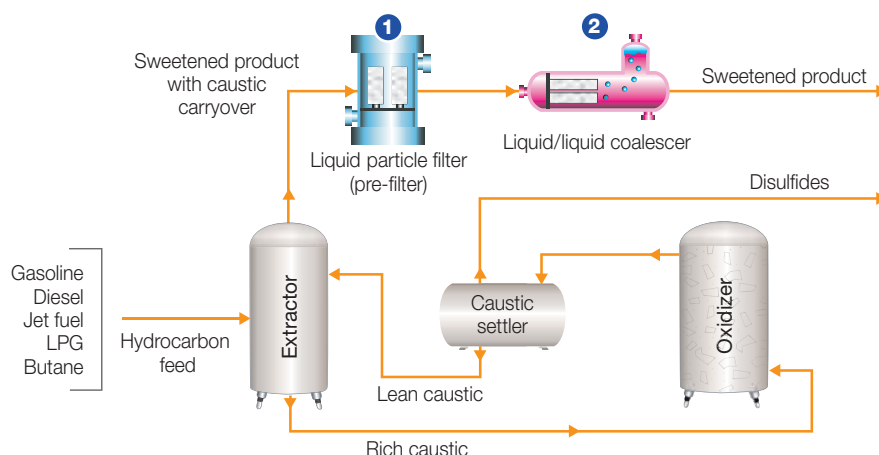
Refinery Needs

- Achieve oil production quotas via reliable treatment of mercaptans and hydrogen sulfide
- Meet product quality specifications for haze and sodium levels
- Protect and extend run life of downstream catalytic process units

Production Challenge/Pall Solution

Challenge	Solution
Meet product specifications	<p>Improve refinery productivity and product specifications by removal of spent caustic carryover via effective liquids and solids removal downstream of the extractor.</p> <ul style="list-style-type: none"> • KO pots, sand beds, water washes, and salt towers may not effectively remove the stable spent caustic emulsion. • High efficiency PhaseSep® liquid/liquid coalescers reliably meet 'clear and bright' product specification and sodium levels downstream.
Protect downstream catalytic process units	<p>Improve protection of downstream process units by removal of spent caustic carryover via effective liquids and solids removal downstream of the extractor.</p> <ul style="list-style-type: none"> • KO pots, mesh pads, cyclonic devices and conventional filter-separators may not effectively remove the stable spent caustic emulsion. • High efficiency PhaseSep liquid/liquid coalescers reliably meet 'clear and bright' product specification and sodium levels downstream. • Solid particle contaminants in the spent caustic may not be adequately removed by filters that exhibit unloading, media migration, channeling or poor sealing. • A range of filter elements is available to reduce suspended solids to improve the efficiency and life of the liquid/liquid coalescer.

Process Flow Diagram



Note: A representative caustic extraction process is shown. Many other caustic treating processes exist.

Key Applications/Filter Recommendations (*other applications not shown*)

Application	Pall Product	Advantages	Customer Benefits
1 Prefiltration prior to liquid/liquid coalescer	Nylon Profile® filter Ultiplex® High Flow filter	Efficient removal of solids	Low operating costs by improving the life of the liquid/liquid coalescer
2 Spent caustic removal	PhaseSep liquid/liquid coalescer in horizontal configuration	Remove caustic carryover from hydrocarbon product	Assured production and quality by meeting specifications for haze and sodium levels Prevents downstream unit downtime from caustic contamination of catalytic processes

Experience Matters

Don't take our word for it. Just ask the thousands of refinery engineers around the world why Pall is their supplier of choice for filtration and separations solutions. Let them tell you how our extended filter life and simple maintenance protocols save them time that can be spent on value-add process improvements. Ask them about the reliability and consistent output from the Pall systems installed in their critical processes. You don't want to spend time worrying about your filters and coalescers, and we don't want you to either.

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Pall Corporation

Fuels and Chemicals

25 Harbor Park Drive
Port Washington, New York 11050
+1 516 484 3600 telephone
+1 888 873 7255 toll free US

Visit us on the Web at www.pall.com

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