

## Refineries: Application Focus

### Final Products

#### Process Description

The major products of oil refining are: LPG, gasoline, diesel, jet fuel, fuel oil, and kerosene — a blend of several different streams produced by the various refinery processes to meet final specifications. These products are then stored in a tank farm on the refinery premises before being delivered to retail markets. Delivery may be via pipeline to area distribution terminals, or loaded onto tanker trucks for direct delivery to retail outlets.

Prior to leaving the site, the products are usually filtered and coalesced to remove solid contaminants and suspended water. Contaminants, such as rust and pipe scale can foul and erode distribution equipment (e.g. pumps, nozzles, flow meters) as well as end users' equipment (e.g. engines, boilers). Water can also cause engine maintenance problems. Water in fuels often extracts highly corrosive sulfur compounds and chlorides exacerbating corrosion and plugging in engine injection systems or the engine itself.

Ensure your final products reliably meet your daily production quotas and quality standards.



#### Refinery Needs

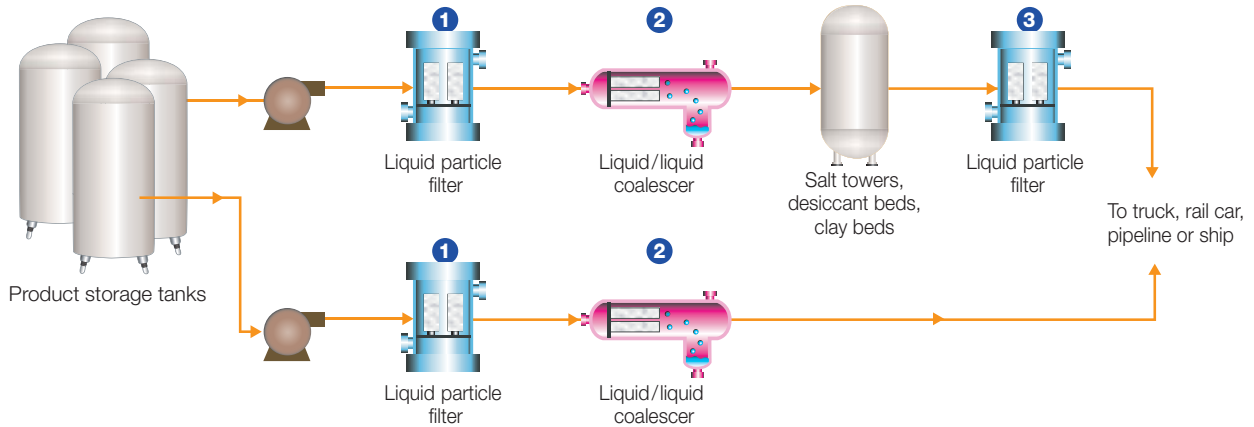
- Achieve oil production quotas by meeting product quality particulate and water specs
- Achieve product specs without the need for expensive reprocessing
- Protection against corrosion and contamination of product transfer equipment
- Protection of end users' equipment against corrosion and plugging

#### Production Challenge/Pall Solution

Challenge	Solution
<b>Meet particulate specifications for final products</b>	<p><b>Improve refinery productivity and ensure product specification</b> by removal of particulates formed in storage equipment upstream of the distribution points.</p> <ul style="list-style-type: none"> <li>• A range of absolute and nominal rated filter elements is available to <b>reduce suspended solids to &lt;5 ppmw, and reduce fouling and erosion of distribution equipment as well as end users' equipment.</b></li> </ul>
<b>Guard against hazy final products leading to corrosion and plugging of end users' equipment</b>	<p><b>Reduce corrosive nature of products</b> by removing suspended water upstream of the distribution points.</p> <ul style="list-style-type: none"> <li>• High efficiency AquaSep® XS liquid/liquid coalescers reliably meet 'clear and bright' product specification and 15 ppmw downstream per Aqua-Glo<sup>1</sup> measurement, <b>offering excellent end user equipment protection from corrosion and plugging.</b></li> </ul>

<sup>1</sup> Aqua-Glo is a trademark of Gammon Technical Products Inc.

## Process Flow Diagram



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

Application	Pall Product	Advantages	Customer Benefits
1 Prefiltration prior to liquid/liquid coalescer	Ultipleat® High Flow filters Marksman™ High Flow filters	Removes scale, rust, and solid particles	Freedom from off-spec shipments due to high solids levels Low operating costs by extending L/L coalescer life
2 Free water removal from fuels for shipment	AquaSep XS liquid/liquid coalescers	Removes suspended water from fuel to a concentration below 15 ppm  Does not disarm in the presence of known surfactants (i.e. extremely efficient for “high detergent” fuels) Effective on ‘difficult’ water/fuel mixtures with interfacial tension lower than 20 dynes/cm Long service life Low disposal and maintenance costs	Freedom from off-spec shipments due to high water levels Reduced salt costs when downstream salt dryers are used Elimination of interruptions and changeout costs due to replacement of disarmed coalescers Low cost per gallon treated
3 Downstream of salt, desiccant or clay treatment	Ultipleat High Flow filters Marksman High Flow filters	Removes salt, desiccant or clay fines	Freedom from off-spec shipments due to high solids levels



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