



YOUR PARTNER IN VACUUM
TECHNOLOGY



RCPS[®] Series Reactivation Clay Polishing System

Hering - VPT GmbH
www.hering-vpt.com

HERING – Vacuum Process Technology

Invaluable experience and customized solutions powered by German Engineering

HERING VPT has specialized in oil processing equipment for used lube oils and transformer oils. Already in 1909 the first HERING oil purification plant was built. This was the starting point for a number of inventions leading to a broad range of products for the oil processing and transformer industries. With this **experience collected in over 100 years of successful operation**, continuous efficiency improvements of our plants were made. Today, we offer specialized oil treatment plants to produce good as new oils from all kinds of used oils including lube & transformer oils.

HERING Systems are remarkable for their efficient and robust design, as well as their ease of operation and maintenance. We install **only high quality components from Germany**, respected Western European & Northern American brand manufacturers. Our systems are designed for **long lifetime, reliability** and effective operation. Each plant is **custom-made** and delivered with all required aggregates to leave nothing to be desired.

Together, we will develop the perfect solution for you and your company. We are looking forward to serving you!



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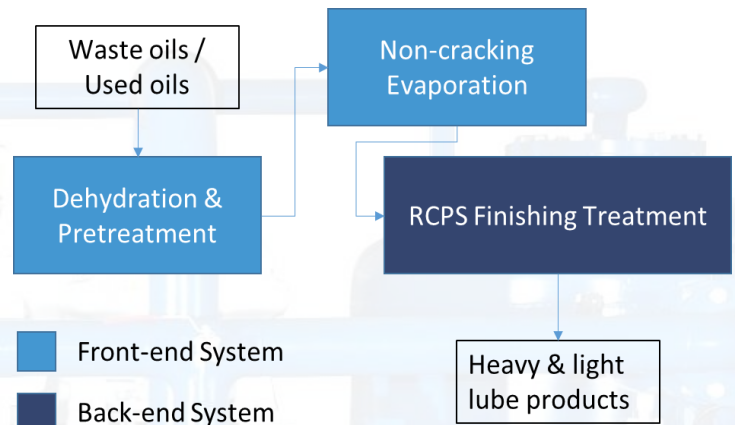


HERING – Vacuum Process Technology

RCPS® improves color, sulfur content as well as odor and enhances oxidation resistance

The RCPS® Series of reactivation clay polishing systems from HERING provide an economical alternative to hydrogen-treatment plants as a means of adding value to a re-refined lube oil. Designed as an add-on or retro-fit (back-end) to distillation systems, the plant is applicable to all types of oil refineries as a final polishing stage. We also supply the RCPS® as a full HERING WORP® waste oil recycling plant including evaporation front-end.

Our HERING RCPS® Series improves waste oil distillates in terms of color, sulfur content and odor and, thus, leads to a more valuable oil product. The input oil is upgraded via an adsorption type process to remove any unwanted chemical substances from the treated oil.



The system is especially effective on undesirable polar components within the oil. The RCPS® has the ability to eliminate sulfur from 2000 PPM to <300 PPM in a single pass. Processing oil through the RCPS results in an oil that is stable against oxidation over any measured timescale – this increase in shelf-life is an added benefit of the reactivation clay polishing system.

The Viscosity Index is not degraded by the clay polishing system so if a Group II oil is fed into the system, then the RCPS® will produce an enhanced Group II oil at the outlet.

HERING – Vacuum Process Technology RCPS® Series significantly outperforms conventional base oil finishing treatments

The RCPS® is based upon banks of active columns that contain our specially manufactured HERING PHÖNIX® clay. The physical characteristics of this modified clay allow it to be reactivated once saturated, and thereby permitting several hundred cycles to be run before being replaced. Once exhausted, typically after 6 months to a year of continuous operation, the clay is disposed of in a conventional landfill site as a dry non-hazardous waste.

The reusability of the HERING PHÖNIX® adsorbent is a major advantage compared to conventional bleaching earth treatments. Our system brings down operating costs and eliminates environmental problems. Average lifetime cost of clay per gallon of oil processed is US 2 cents at 2017 prices. Therefore, the HERING RCPS® Series is an excellent economic & environmental proposition for your finishing treatment and desulfurization needs.



| Project #: | Base Stock | BEFORE | AFTER |
|--------------------------|------------|---------|--------|
| Client ID #: | 300N | | |
| Matrix: | Liquid | | |
| Parameter | Method | Results | |
| Ash | ASTM D482 | <0.01% | <0.01% |
| Flash Point | ASTM 1010 | >93°C | >200°F |
| Specific Gravity | ASTM D1298 | 0.8571 | 0.8581 |
| Sulfur, Wt% | ASTM D2622 | 0.2029% | 0.036% |
| Viscosity cSt@40°C | ASTM D445 | 32.67 | 33.1 |
| Viscosity cSt@100°C | ASTM D445 | 5.88 | 5.74 |
| Viscosity Index | ASTM D2270 | 113 | 114 |
| Carbon Conradson Residue | ASTM 189 | <0.5% | <0.1% |
| Clay-Gel, Vol% | ASTM D2007 | | |
| Saturates | | 97.6% | 99.2% |
| Polar Compounds | | 2.4% | 0.8% |
| Aromatics | | <1.0% | <0.2% |
| Pour Point, °F | ASTM D97 | -23°C | -6°F |

The HERING RCPS® Series of reactivation clay polishing systems is especially suited for low and medium capacity oil recycling and oil processing plants. We can supply our oil distillate finishing treatment system in oil processing capacities ranging from 50 liters per hour for a laboratory setup to 10,000 liters per hour for a medium size re-refining plant.



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The HERING RCPS® Series is offered as an add-on or complete waste oil recycling plant

Our complete lube oil recycling plant consists of a front-end evaporation and a back-end RCPS® for finishing treatments. The front-end uses our NCE® non-cracking evaporator. Smearing an ultra-thin layer of used oil onto the inside of a vessel wall under high vacuum allows for an extremely energy-efficient means of vapourising the various constituents that make up the feedstock. Subsequent condensation and separation into light, medium and/or heavy molecular weight lubes followed by polishing with a reactivatable clay system yields a stable, odour-free product.



Virtual multi-pass operations can be achieved by a single pass through the RCPS as it is designed to switch from parallel to series mode operation via the custom SCADA supplied with every system. HERING uses the unique ROTAPRO® mode of operation which provides a seamless switching between four banks of columns, bringing the freshly reactivated bank in as the last in a continuously moving series operation, automatically dropping out the oldest bank for reactivation. This allows to easily switch between different processing modes for each reclaimed oil stream.

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Economic and operational benefits make HERING RCPS® Series the perfect choice

Polishing your high viscosity oil distillates with the RCPS® Series provides you with:

- **Low operating costs and initial capital investments** compared to other finishing treatments
 - **Flexible operating modes** – Parallel mode operation is single-pass, least contact time, fastest processing. Series mode operation simulates triple-pass, most contact time, better quality oil.
 - **Modular system** ensures flexible layouts while all modules can be shipped inside a 40-foot high cube container for reduced shipping and handling costs
- **Full client involvement** during the manufacture, from engineering approval through to start-up
 - Dual gas scrubber allows for integration of exhaust into front-end refinery to **minimize points of emission** for environmental permit
 - **All global voltages and frequencies available**
 - **Low oil losses** as part of waste becomes feedstock for front-end refinery
 - **All waste** created by RCPS® is **classified as standard industrial waste** leading to low environmental costs



Unattended Oil Polishing Operation



Complete WORP® Waste Oil Re-refining Plant including Front-end and Back-end Systems

HERING – Vacuum Process Technology

Provides complementary training services for your benefit

HERING VPT offers its costumers in the context of the order fulfillment **free training, commissioning, start-up and custom process optimization** with each HERING RCPS® Series system to help you get the maximum out of your system.

To ensure a proper operation of your system HERING VPT recommends an **on-site service**. This will be coordinated directly by HERING VPT and partly carried out with qualified partners.

Plants older than 30 years fall naturally under the plant service.



We are available for you **24 hours** a day, **7 days a week** in order to help you with your plant problems.

HERING – Vacuum Process Technology

The standard in oil purification and insulation treatment solutions



- ◆ Vacuum Oil Purifying Plants
- ◆ Transformer Oil Regeneration Systems
- ◆ PCB Removal Systems
- ◆ Vacuum Drying Plants
- ◆ Waste/Lube Oil Re-refining Plants (Front-end & Back-end Solutions)
- ◆ Base Oil/Recycled Oil Polishing Systems
- ◆ Vacuum Pumping Stations
- ◆ Bushing Dryers
- ◆ Oil Storing and Filling Plants
- ◆ Hot Oil Spraying Systems
- ◆ Vacuum Pressure Impregnation Plants



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