



RYDALL **VP**

BIODEGRADABLE Specialized Degreaser TM

pH Neutral, Biodegradable, Specialized Cleaner/Degreaser

RYDALL VP is specifically designed for refinery process vessel cleaning and degassing. This truly revolutionary product will reduce downtime, labor and water required for cleaning and degassing refinery process equipment. **RYDALL VP** can be applied in circulation or Vapor Phase applications. In vapor phase applications, **RYDALL VP** will remove oil, gas, LEL, H₂S and benzene with the added benefit of cleaning the hydrocarbon deposits in a single application.

RYDALL VP offers a versatile and comprehensive solution for decontamination, cleaning and degassing of refining and petrochemical applications. **RYDALL VP** provides a fast and extremely effective formulation of surfactants that is still safe for your personnel, your equipment and the environment. **RYDALL VP** is also effective as a wetting agent additive to alkali or acidic solutions for chemical cleaning.

A significant advantage over other methods is that the **RYDALL VP** can be used by either your own plant personnel or by a plants on-site contractor without the need to bring in specialized consultants or contractors.

Specific Applications:

- Amine Treater Units
- Coker Units
- Desalters
- Flare Drums
- Gas Compression Systems
- Hydrofiner Units
- Pipelines
- Reformers
- Sour Water Strippers
- Sulphur Recovery Units
- Caustic Treaters
- Crude Units
- Ethylene Units
- Flare Systems
- Hydrocracker Units
- Oil Separators
- Preheaters
- Sat Gas Units
- Transfer Lines
- Vacuum Units

www.rydalldegreasers.com

How Vapor Phase Cleaning Works:

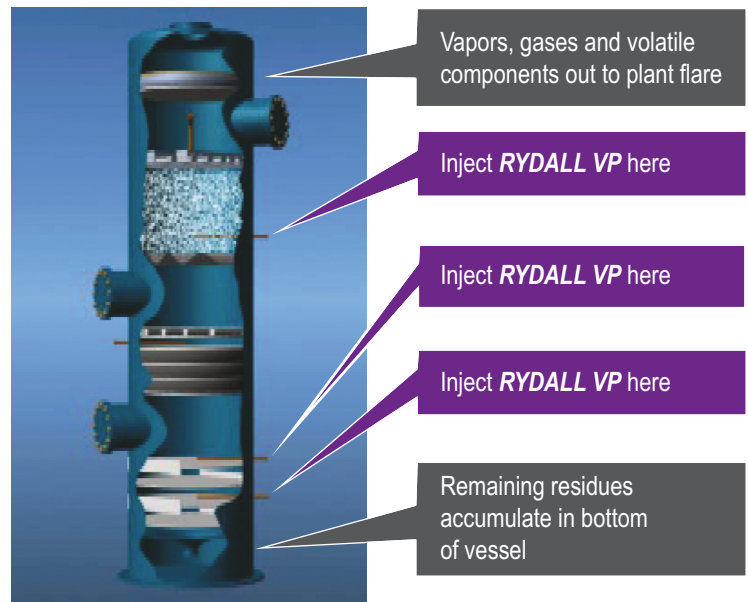
Initially the saturated steam with the vapor phase **RYDALL VP** will condense on the hydrocarbon residue coating the walls of the vessel, and start to increase the temperature of the residue. Once the residue is heated, the vapor phase **RYDALL VP** will penetrate the residue and condense on the metal surfaces of the vessel. The presence of the vapor phase **RYDALL VP** will cause the vessel's metal surfaces to become water wet, and allows the hydrocarbon residues to be flushed more easily from the metal surface by the action of the steam condensate containing the **RYDALL VP**. Vapors, gases and volatile components will be carried out through the venting of steam, usually to the low point drains and plant flare header. The remaining hydrocarbon residues and sludge that accumulates in the bottom of the vessel will be emulsified by the steam condensate and vapor phase **RYDALL VP** that also runs down to the bottom.

Vapor Phase Cleaning Procedures:

The addition of chemicals to the saturated steam injection (meaning the vapor phase) enhances the steam to remove the unwanted contaminants in shorter time periods.

The general sequence of work using the vapor phase cleaning approach is as follows:

- Determine the steam conditions
- Attach a chemical injection nozzle to the saturated steam supply
- Determine the amount of chemical to be used, and the chemical injection rate
- Slowly warm up the equipment to be cleaned using the saturated steam supply
- At target temperatures, begin injection of chemicals at the calculated flow rates
- Perform testing on the steam condensate formed
- Determine the end point of the vapor phase cleaning
- Stop injection of chemicals
- Let steam continue to purge systems
- Shut down, cool, and air purge vessels
- Isolate / blank the system as required
- Inspect the cleaned vessels
- Maintenance work to begin



Circulation Cleaning and Degassing:

The basic process for vessel and pipe cleaning and degassing involves an aqueous solution of **RYDALL VP** that is circulated at an elevated temperature through the specified equipment and associated piping. A procedure that utilizes **RYDALL VP** in a chemical circulation will remove the oil and sludge from all wetted surfaces and reduce benzene to less than 1 ppm, H2S to near zero and LEL to near zero.



RYDALL VP cleaning and degassing technology is the fastest, safest, most cost-effective solution for a wide variety of applications. **RYDALL VP** allows our customers to significantly reduce downtime for degassing and cleaning vessels and piping allowing you to get the unit on-line faster. Apex Engineering Products Corporation can provide comprehensive project planning services prior to your turnaround that can include pre-planning meetings, on-site inspections, detailed application procedures, estimated water & chemical usage and waste disposal recommendations.

BIODEGRADABLE

For additional information, please contact our manufacturing facility at 630-820-8888 or visit our website at www.ApexEngineeringProducts.com.

Precautions: Not to be taken internally. Exposure to concentrate-mist may cause mild irritation of nasal passages or throat; remove to fresh air. Wear rubber gloves and eye protection. Keep out of reach of children and pets. Do not allow to dry on any surface. Dispose of cleaning residue in accordance with local, state, and federal laws and regulations. Avoid freezing. For additional information, review the **RYDALL VP** MSDS.