

ET SYSTEM



ROCHEM
TECHNICAL SERVICES
Established in 1978

A HIGHLY COST EFFECTIVE, ENVIRONMENTALLY FRIENDLY SOLUTION TO THE MANAGEMENT OF CONTAMINATED CHEMICAL WASTE FROM OFF-LINE COMPRESSOR WASHING

ROCHEM'S EFFLUENT TREATMENT SYSTEM (ET-SYSTEM)

Saves gas turbine and process compressor operators a lot of money in complying with costly pollution regulations while maintaining plant efficiency at the highest possible levels.

Regular gas turbine and process compressor cleaning is vital to maintain output and fuel efficiency- especially in today's world of very high fuel prices and low margins of profit.

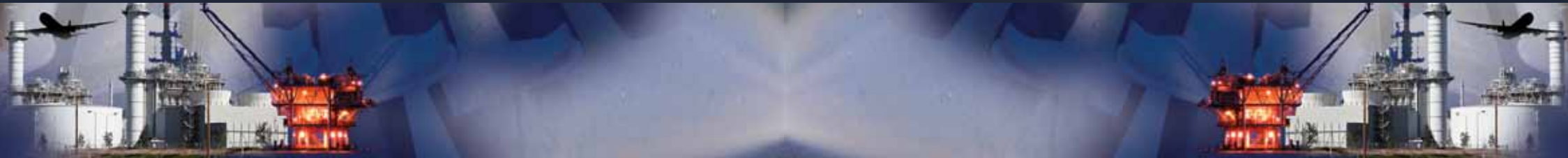
Some operators utilise a combination of on-line and off-line washing while others rely solely on off-line washing to maintain acceptable levels of cleanliness and efficiency.

However, while on-line washing offers the advantage of having no contaminated waste to deal with, off-line washing procedures carry the considerable extra cost penalty of having to safely deal with the contaminated waste chemical and rinse water which result from this cleaning procedure.

An important innovation in crank-wash effluent management and post treatment from the world leader in Gas turbine & process compressor cleaning. The all stainless Rochem Effluent Treatment System (ET System) utilises an advanced membrane separation process all mounted in a compact portable frame.



ET SYSTEM



Rochem's ET-System can reduce these problems and costs by 90% or more

- Separates all crank wash waste chemical and rinse water back into its original constituents of (a) Concentrated chemical and (b) Pure water.
- Recovers 90 to 100% of the water element as pure water which can be stored for future re- use of be safely discharged to drain without further treatment.
- Recovers up to 100% of the original post-wash chemical element—including the removed compressor contamination—in concentrated form either for longer term storage and eventual safe disposal at lower cost or for immediate incineration on site.
- By separating up to 100% of the water element from the crank-wash waste - which includes all the contaminated post rinsing water - the remaining volume of contaminated chemical waste that has to be disposed of is typically reduced by 95% or even more depending upon how much rising water has been used and what the original water/chemical solution mix ratio was
- This process allows for the following two disposal options both of which are simple and non- polluting while and both of which offer major cost savings.

The Rochem Effluent Treatment system has been specially designed to work with Rochem compressor cleaning chemicals to give our gas turbine and process compressor customers the ability to separate on-site their crank wash effluent and return the majority of the clean and separated demineralised water safely to drain or even retain for future re-use.



Rochem manufactures simple to highly sophisticated compressor wash skids such as this system for the UK's latest warships which is built for shock loadings of 25G



Patented nozzle systems to effectively deliver cleaning solutions into the gas turbine or process compressor. This is a special atomising header for helicopter application.



Option 1

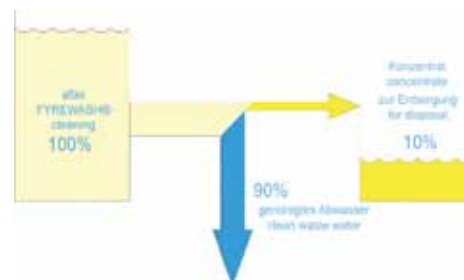
Simply store the much reduced volume of concentrated chemical waste safely on site until sufficient has been collected for disposal in one economical load- instead of numerous smaller loads - by a waste management contractor

Option 2

Mix the relatively small volume of chemical concentrate with fuel oil and burn on site in any low grade boiler system—thereby achieving the absolute optimum of ZERO DISCHARGE from off-line compressor washing procedures

The ET-System separation process is simple and efficient. The crank wash wastewater is fed into the inlet side of the separation module pump from a collection tank or well.

The pump maintains the required module pressure (up to 15 BARG) to force the demineralised water from the effluent, through the membranes and into storage or direct to drain as preferred. The spent chemical and dirt cannot pass through the membrane and is sent to a collection tank for later disposal on or off-site.



Rochem is a world leader in compressor cleaning systems, cleaning chemicals and RO and UF water treatment systems

- Over 40 years in Marine and industrial chemical manufacture
- Over 30 years leadership in the in-house design, development and manufacture of compressor cleaning systems for gas turbine and process compressors
- Over 25 years in-house design and manufacture of cutting edge Reverse Osmosis (RO) and ultra-filtration (UF) systems
- Over 20 years in-house RO and UF membrane design and manufacture

Management and safe disposal of contaminated waste chemical and water from compressor washing can be a very costly problem for gas turbine and process compressor operators.

So Rochem has put its many decades of chemical cleaning and water treatment knowledge to good use to develop its Effluent Treatment System – The ET-System – now available world-wide from the Rochem Technical Services Group.

At the heart of the ET-System is the unique Rochem disc-tube membrane separation technology.

An advanced hydrodynamic flow pattern ensures that the membrane surfaces do not become readily clogged by oily/carbonaceous matter or suspended solids during the separation process of the crank -wash wastewater.

The separation process generates two separate streams (a) the original demineralised water and (b) the spent chemical containing the removed fouling from the compressor.

Another important advantage of this membrane separation system is that the entire membrane module can be removed from its pressure vessel for inspection, cleaning or replacement in just a few minutes.

MF Mikrofiltration

UF Ultrafiltration

NF Nanofiltration



Rochem manufactures and supplies a full range of on-line and off-line compressor cleaning chemicals (see back page for details).



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ROCHEM Product Range

BP RANGE

Batch pump system for on-line/off-line compressor cleaning of gas turbine engines
For engines in the range of 0.5 – 250MW output

OW1 & OW2

Observation Windows for all gas turbine engines

ViP RANGE

For on-line/on-crank compressor cleaning of engines in the range of 0.5 – 250MW output

ED RANGE

Pump eductor system for on-line/off-line compressor cleaning of gas turbine engines
For engines in the range of 0.5 – 250MW output

NOZZLES

Gas turbine compressor cleaning nozzles
Dual and Triple Side Spray Nozzle for all gas turbine engines

TRIPLE STAGE FILTERS (TSF)

Filters for on-line & off-line compressor cleaning system nozzles
For Rochem nozzle systems (and many other in-line filtration applications)

PC RANGE

Process compressor cleaning systems

ET SYSTEM

A highly cost effective, environmentally friendly solution to the management of contaminated chemical waste from off-line compressor washing

D-W GENERATOR

Supplies high quality demineralised water for compressor washing

FYREWASH® F1

A high purity solvent & surfactant formulation for heavy duty on & off-line compressor cleaning

FYREWASH® F2

Highly biodegradable natural solvent for on-line and off-line compressor cleaning

FYREWASH® F3

Highly biodegradable water-based detergent for on-line and off-line cleaning of compressors

FYREWASH® F3RR

Developed specially to meet the needs of and clean Rolls Royce gas turbine compressors.

FYREWASH® SB

The original heavy duty on-line and off-line cleaner for gas turbine compressors

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ISO9001:2008
Cert. No. AQA665377



ISO14001:2004
Cert. No. RQA665378



Certificate No: AJA08/12780

ISO9001:2008 and ISO14001:2004 Lloyd's Accreditation attained by ROMACO – Manufacturers of Fyrewash Chemicals

ISO9001:2008 AJA Accreditation attained by RTS-Europe – Manufacturers of equipment