



# VAIOCS

CLEANING SOLUTIONS FOR  
HEAT TREATMENT

**EMO**

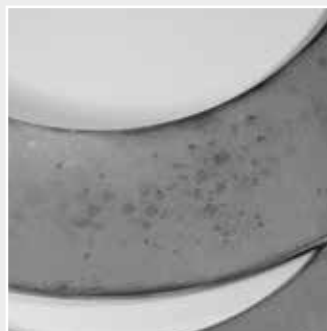
competence in cleaning

# VAIOCS – Excellence in Cleaning

The patented VAIOCS technology is the trademark of EMO Oberflächentechnik GmbH. The cleaning systems set standards worldwide when it comes to fine or ultra-fine cleaning with lowest values for residual contamination. By creating this process, EMO achieved a revolution in industrial parts cleaning. VAIOCS is the acronym for Vacuum Assisted Inorganic Organic Cleaning System that identifies a technology in which all cleaning steps are performed under vacuum and increased temperature conditions. Benefits: excellent cleaning results, fast drying without any residues.

Over the years, this technology has continuously been developed. Today, the VAIOCS systems which were originally designed for use with CHCs, HCs and modified alcohols are also available for purely aqueous cleaning or for combined cleaning steps. The systems are real all-rounders which are equally suited for the process steps of degreasing, cleaning, drying and preserving.

Because of its superior cleaning results, VAIOCS technology has established itself worldwide, particularly for cleaning jobs before or after heat treatment of metallic parts. Using the pioneering EMO cleaning systems designed for hardening shops, both oil contaminants and inorganic residues from previous processes may be removed reliably. Thus, process capable surface finishing and heat treatment without the risk of scrap may now be implemented.



*After aqueous cleaning  
in a conventional system.*



*After hybrid cleaning using  
VAIOCS technology.*

## Hybrid Cleaning – Dissolution Using Similar Substances

<b>Organic contaminants</b> (non-polar / water-insoluble) Eg.: oil / fat / wax / petroleum	<b>Inorganic contaminants</b> (polar / water-soluble) Eg.: emulsion / salt / rubbed-off particles / fingerprints	
<b>To be cleaned using</b>	<b>To be cleaned using</b>	
<b>Chlorated hydrocarbons (CHCs)</b> Eg.: perchloroethylene, trichloroethylene		
<b>Hydrocarbons (HCs)</b>		
<b>Modified alcohols</b>		
<b>Mixtures (MAL + HC)</b>		
	<b>Aqueous cleaning</b>	
<b>HC or mixture</b>	<b>HYBRID CLEANING</b>	<b>Aqueous cleaning</b>

VAIOCS hybrid systems from EMO ensure best-in-class cleaning results by a combination of hydrocarbon and water based cleaning.



# Cleaning Using **Hydrocarbon**

## The Benefits at a Glance

- Perfect solution for organic contaminants such as hardening oil before tempering.
- Suitable for use with CFC racks.
- Excellent cleaning results for bucketing items such as blind holes.
- Unlimited service life of the cleaning agents ensured by filtration and distillation.
- High energy efficiency thanks to the latest technologies.

The classic cleaning agent is still the first choice when it comes to stubborn inorganic contaminants. The cleaning procedure using hydrocarbons or modified alcohols under vacuum conditions and increased temperature levels provides best results, even for complex part geometries.

The process is an absolute must where specifications on residual contamination are to be met reliably. Thanks to the self-contained circulation system, EMO systems operate in an environmentally compatible and energy-efficient manner.

## Easy Integration



EMO has gained experience in special equipment engineering and creates tailored compact cleaning systems which exactly meet customer specifications.

User benefits: easy integration, fast commissioning, optimised space requirements, design of special programs and processes, maximum efficiency.

## Flexible Loading



Based on the customer request, the working chamber is loaded automatically and/or manually. Connection to all common loading or discharging equipment as well as process control systems may easily be implemented.

## Excellent Energy Efficiency



The energy efficient design of the entire system including consistent heat insulation of tanks and piping systems, sophisticated heat recovery, automatic standby modes and many other detail solutions sets the benchmark with regard to energy efficiency.



# Hybrid Cleaning

## The Benefits at a Glance

- Perfect solution for organic and inorganic contaminants, e.g. before nitriding.
- Suitable for use with CFC racks.
- Maximum flexibility for a wide variety of cleaning jobs.
- Fast and stainless drying under vacuum conditions.
- Excellent operating efficiency thanks to combined processes.

Based on their pioneering combination of aqueous and hydrocarbon cleaning processes, the VAIOCS hybrid systems set the benchmark in ultra-fine cleaning. This technology combines the benefits of both water- and hydrocarbon-based cleaning using the Dissolution Using Similar Substances principle and achieves superior cleaning results for both organic and inorganic contaminants.

When an additional aqueous rinsing bath is used, a solely aqueous process may be implemented.





# Aqueous Cleaning

VAIOCS aqueous-based cleaning systems are ideal for cleaning inorganic contaminants. In combination with the VAIOCS technology, aqueous cleaning provides cleaning quality that has not been achieved so far.

Using the aqueous cleaning agents under vacuum conditions, excellent homogeneous deep cleaning effects are provided even for tightly packed bulk containers. Also with regard to drying, vacuum systems provide significantly better results while consuming less energy, as compared with conventional systems.

## The Benefits at a Glance

- Perfect solution for inorganic contaminants.
- Maximum environmental compatibility.
- Excellent cleaning results.
- Fast drying under vacuum conditions.
- Exemplary energy balance, since the washing and rinsing bath is heated through aqueous distillation.

## Efficient Operation



The cleaning agents are circulated in the system without nearly any losses. Continuous care of the cleaning fluids by means of filtration and distillation provides unlimited service life and ensures economic and environmentally compatible operation.

## Easy Upgrade or Retrofit



The requirements in industrial parts cleaning may rapidly change because of new products, environmental requirements or updated customer specifications.

In these cases, EMO will use its long-term knowledge to support the customer and adapt the existing VAIOCS system to the new requirements.

## Consistent Service Offering



In addition to the system business, EMO also offers a holistic service package for industrial parts cleaning.

The comprehensive range of services includes consulting and service, customer support and training as well as residual contamination analyses in our in-house laboratory.



# 35 Years of Experience, Know-how, and Competence



EMO Oberflächentechnik has been dedicated to industrial parts cleaning since 1979. Competence in Cleaning is more than just a slogan, it expresses the company's philosophy to strive for perfection. Experience and know-how gained during 35 years of activities in plant engineering and process technology mean that every EMO system built today is an integrated system providing the highest levels of efficiency.



At our headquarters located in Bretten/Germany, highly trained employees provide quality that is certified according to the highest standards. EMO is committed to Made in Germany – installed systems all over the world give proof of superior know-how from Southern Germany.



**competence in cleaning**

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**SURFACE ALLIANCE**

