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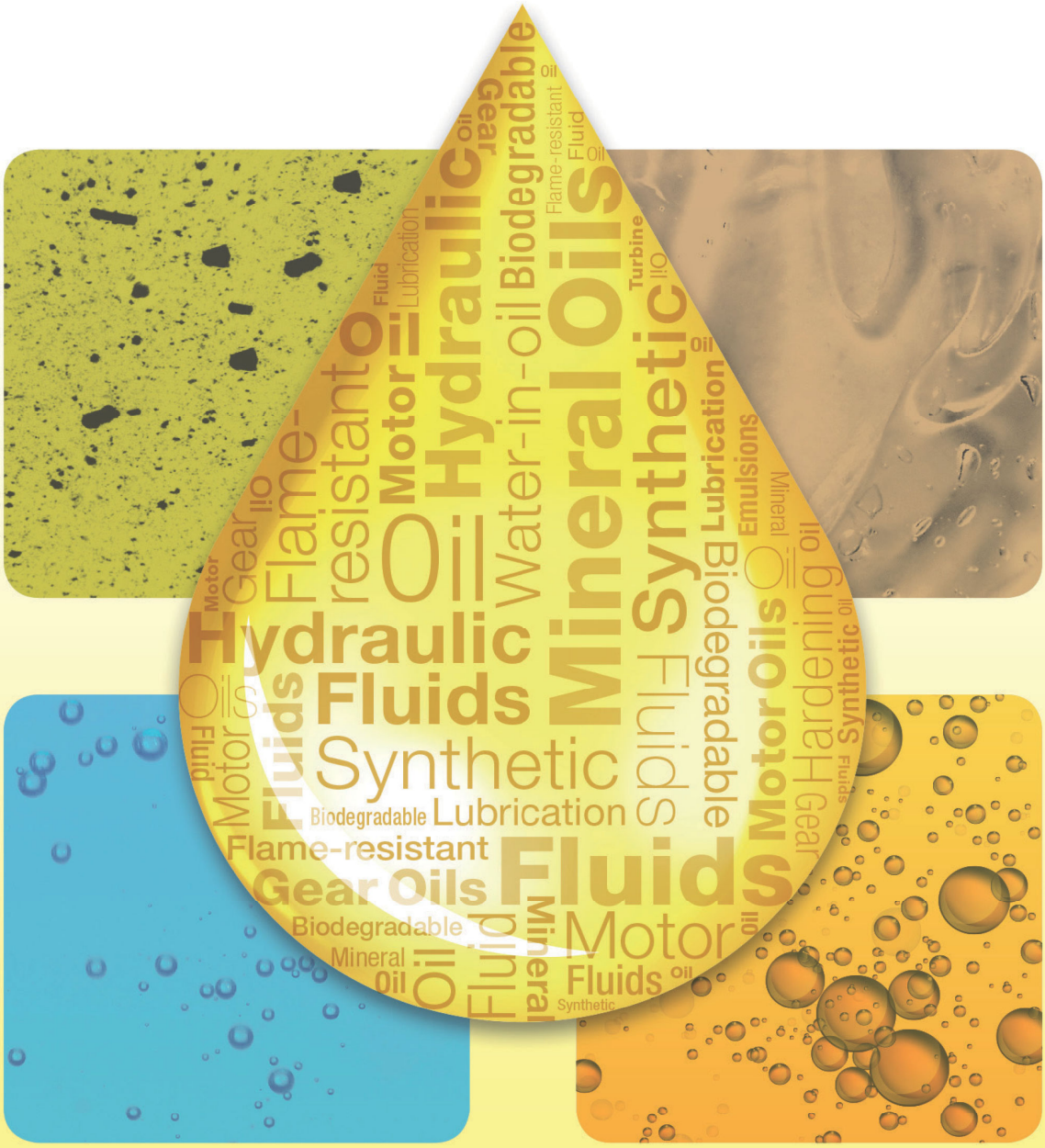
HYDAC INTERNATIONAL

Fluid Conditioning

All-Round Protection from the Fluid to the System



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HYDAC

Your competent partner for optimum fluid conditioning

With over 9000 employees worldwide, HYDAC is one of the leading suppliers of fluid power, hydraulic and electronic equipment.

More than 50 overseas subsidiaries and over 500 sales and service partners guarantee competent on-site service – wherever you need our support.

Our wide range of products, combined with our expertise in development, manufacturing, sales and service, allows HYDAC to provide comprehensive fluid conditioning concepts – from individual filter components to the complete system.

The operating fluids

HYDAC offers stationary, mobile and portable fluid conditioning systems for filtering, dewatering, degassing and conditioning almost all operating fluids, such as:

- Hydraulic fluids
- Lubricating fluids
- Transmission oils
- Engine oils
- Compressor oils
- Turbine oils
- Rolling oils
- Hardening oils
- Mineral oils
- Synthetic fluids
- Fire-resistant fluids
- Rapidly biodegradable fluids
- Flame-resistant fluids
- Water-in-oil emulsions
- Oil-in-water emulsions

Our solutions

- Removal of solid particles, water, oil degradation products and gases
- Stationary, mobile and portable units
- With integrated or retrofittable fluid sensors
- Filter element technologies especially for bypass flow:
  - High contamination retention capacity
  - High filtration efficiency

Your benefits

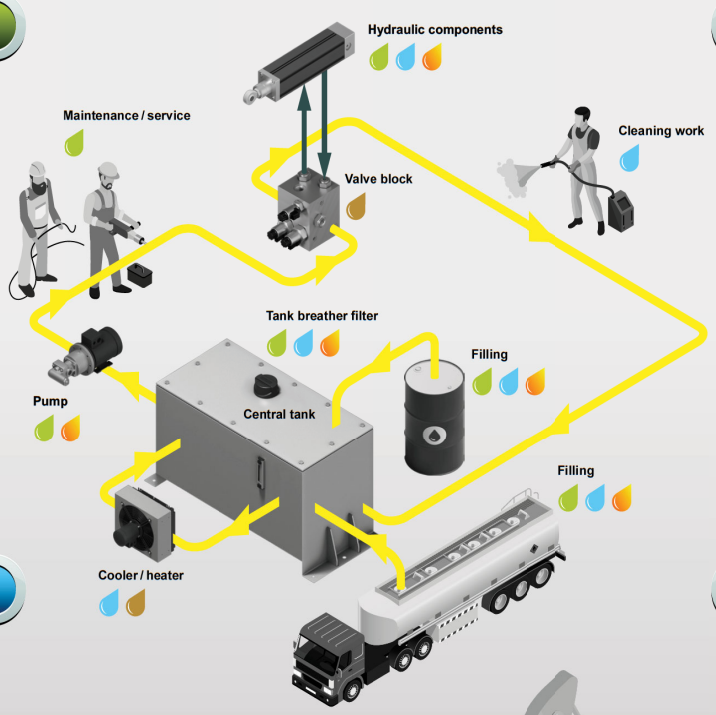
- Increased machine availability
- Optimised service life of components and system filters
- Longer oil change intervals
- Reduced life cycle cost
- Improved energy efficiency

HYDAC Fluid Conditioning:
Origin and Effects of Fluid Contamination

Solid Contamination

Origin:
- Installation contamination
- Ambient contamination
- Refilling of operating fluid
- Internal wear processes
- Oil ageing

Effects:
- Abrasive wear
- Increased leakage
- Component failure
- Control inaccuracies
- Blockage of control pistons
- Short fluid service life



Gel-like Contamination

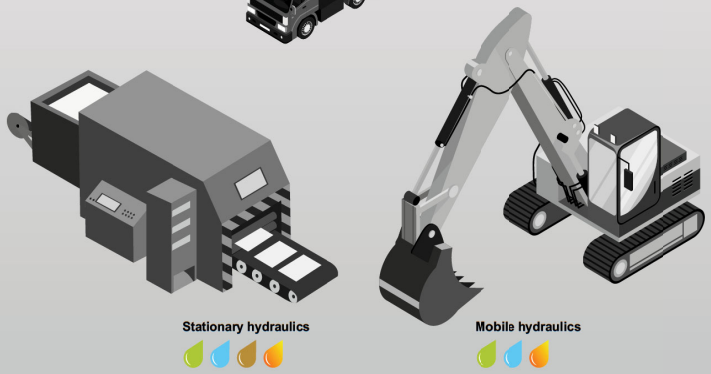
Origin:
- Oil ageing
- Oil mixing

Effects:
- Reduced lubrication gaps caused by deposits
- Increased friction and temperature
- Increased bearing wear
- Malfunctions in valves
- Unstable control behaviour
- Damage to dynamic seals
- Leakage
- Blockage of filter elements
- Short filter life caused by sludge formation
- Increased bearing temperature caused by caking
- Reduced system efficiency

Liquid Contamination

Origin:
- Moisture from the ambient air
- Leakage of cooling systems
- Process water / process steam
- Leakage of seals
- High-pressure cleaner
- Chemical processes (combustion, oxidation, neutralisation)

Effects:
- Corrosion
- Reduction in dynamic viscosity
- Reduction in lubricating film thickness
- Contact with surfaces
- Wear
- Change in the oil properties
- Creation of acidic oil degradation products
- Formation of sludge
- Increase in speed of oil ageing
- Cavitation damage



Gaseous Contamination

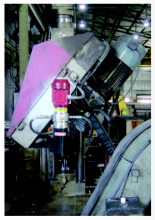
Origin:
- Contact with ambient air
- Outgassing of the fluid
- Leaks
- Process gas

Effects:
- Cavitation
- Oxidation
- Local overheating of the fluid
- Increase in speed of oil ageing
- Control inaccuracies
- Risk of explosion

For Optimum Fluid Quality –
Components and Systems for Fluid Conditioning

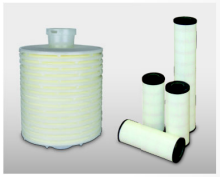
Filtration of Solid Particles





Stationary filter units (OLF)

Mobile filter units MFU and OF5



Dimicron® filter elements

Stationary filter units

Integrated into the system, bypass flow units, normally using their own drive and the option of sensor integration, carry out the fine filtration process and therefore produce consistently high oil cleanliness. The optimum operating conditions of the units result in a highly economical filtration process which can be independent of the operation of the overall system.

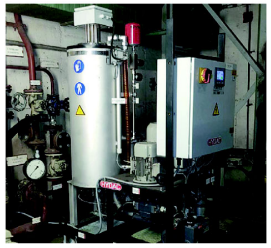
Mobile filter units

Built for mobile use for servicing or in maintenance and repair departments, these units enable temporary bypass flow filtration in systems and also the filtered filling and refilling of fluids. Our sensors can provide optimum protection for systems right from the start.

Filter elements

The filter elements developed especially for use in bypass flow applications offer the possibility of adapting the fluid cleanliness variably to target specifications and therefore protect the units and systems economically and independently of the operation.

Dewatering



Vacuum processes in power plants (top left) and in lock hydraulics (bottom left) (FAM)

Coalescing process (OLS)

Filters with superabsorbers (Aquamicron®)

Vacuum process

The vacuum process works on the mass transfer principle, wherein both free and dissolved water and free and dissolved gases are transferred from the oil to a constantly flowing airflow which is filtered and – by applying vacuum – dried.

Coalescing process

In the coalescing process, minute drops of water (free water) settle on the fibres of the coalescing elements, combine to form large drops and can therefore be removed easily using gravimetric methods.

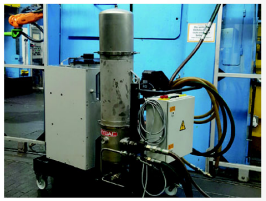
Super absorbers

The removal / dewatering of free water using super absorbers is based on a physical-chemical reaction. The water is bonded firmly within a gel – even in the event of pressure fluctuations.

Removal of Oil Degradation Products

VarnishElimination Unit VEU-F

Ion exchanger VEU-I



Unit for the removal of oil degradation products (VEU-F), either with a plate heat exchanger or a compressor cooler

Filtration

To remove varnish, the oil is first cooled by a plate heat exchanger or compressor cooling unit.
The cooling causes the degradation substances to become larger and they can then be removed effectively in a depth filter. This method can be applied in all hydraulic and lubricating oil applications which are run on mineral oils.

Ion technology

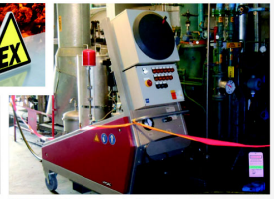
Ion technology is predominantly used in the removal of oil degradation products composed of phosphate esters. The resins used serve to maintain or improve the neutralisation number of the oil so that it matches fresh oil level. This reduces the formation of acidic degradation products and metal soaps.

Degassing

Vacuum-packed tank solution (OXS)

OXS tank installation variant (OXS LID)

Vacuum degassing (FAM ATEX)



FAM ATEX in the chemical industry

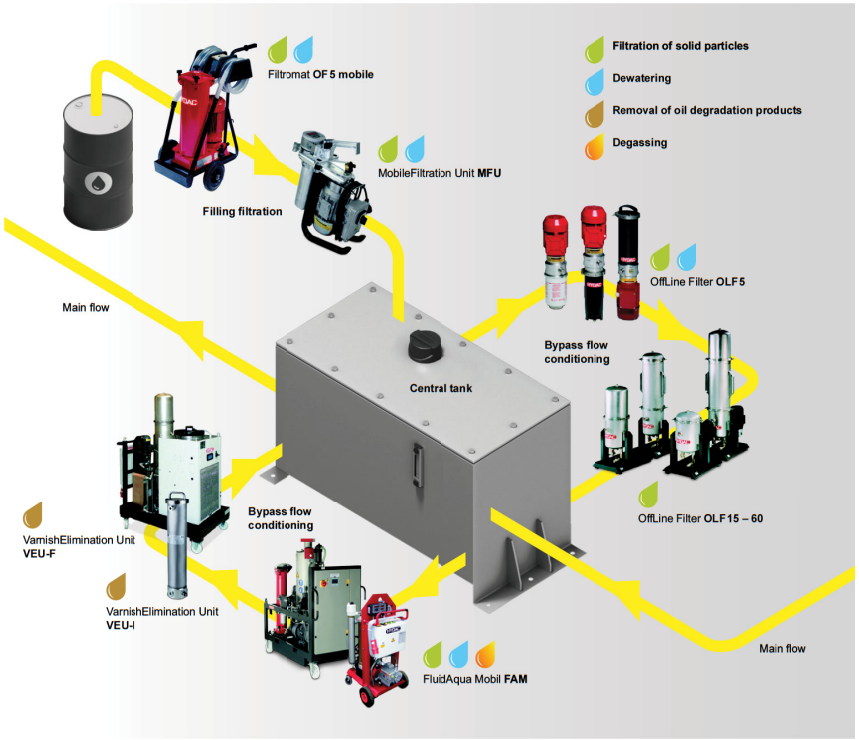
Tank optimisation with active degassing

Depending on the version, the innovative **tank solution** consists of a suitable tank, filters, coolers and a continuously operating degassing and dewatering unit. The tank content of stationary hydraulic systems can thus be reduced drastically. The oil is sealed using an air-tight membrane which lies on the oil surface like a protective skin.

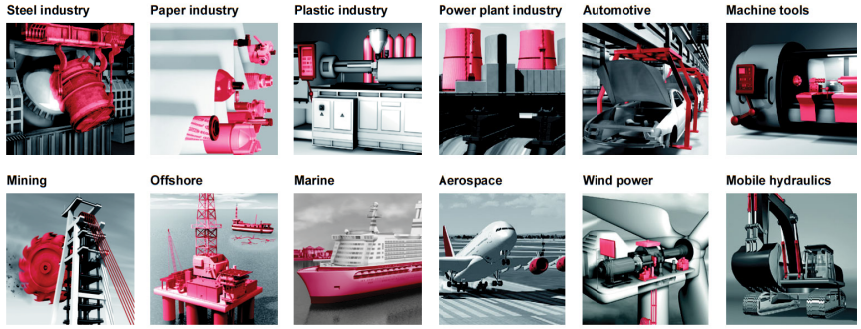
Vacuum process

Due to the **vacuum degassing** in the FAM series, the units are ideally suited for removing free and dissolved gases and air.
For flammable gases, units are available in explosion-proof versions.

For Maximum Machine Availability – The Right Solution for any Application



Diverse possible applications in almost all industrial areas



For Efficient Systems – Economic and Ecological Benefit

Fluid conditioning with the perfect strategy

For a system to be fully efficient and reliable, it needs a sophisticated fluid conditioning strategy and continuous online monitoring, combined with temperature-controlled cooling.

Only a holistic approach for your system can permanently improve the state of the used fluids, significantly increase machine availability and decrease the operating costs frequently by up to 30 %.

HYDAC offers a complete package.

System availability...

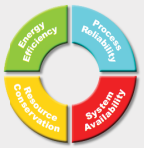
Elimination of solid contamination for reducing
- Component wear
- Internal leakages
- Control inaccuracies
- Valve blockages
- Sludge accumulation in the oil filling
- Accelerated oil ageing

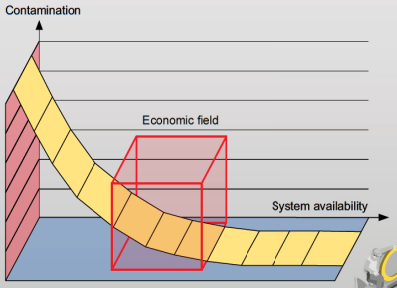
Elimination of water for reducing
- Corrosion
- Wear
- Oil ageing

Elimination of oil degradation products for
- Increasing sustainability by conserving resources and the environment

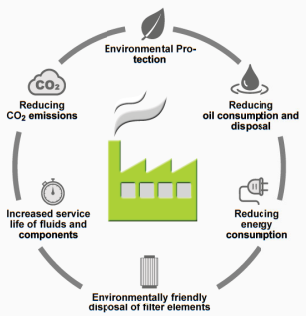
Elimination of gases for reducing
- Corrosion
- Oil ageing
- Oil consumption thanks to prolonged service life of the fluids
- Costs for oil change

and also for
- Increasing energy efficiency
- Increasing production output
- Reducing unit costs
- Increasing operational reliability





...resource conservation...

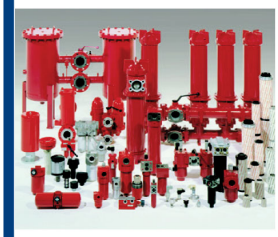


...and savings potential

Example calculation:

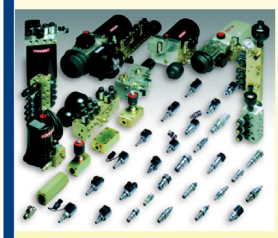
Number of machines (plastic injection moulding machines)		50
Operating hours / year		5,000 h
Machine costs / hour		51.00 €
Current availability		90 %
Total downtime / year		**25,000 h**
Caused by:	mechanical / electrical errors (= 65 %)	16,250 h
	hydraulic errors (= 35 %)	**8,750 h**
of which:	**errors caused by the fluid (= 70 %)**	**6,125 h**
	due to other errors (= 30 %)	2,625 h
Downtime costs due to the fluid		**312,375.00 €**
Wage costs for repairs		**249,900.00 €**
Up to 90 % of the fluid-related costs can be avoided by fluid service!		
Reduction:	of the fluid-related downtime to	**613 h**
	of the downtime costs to	**31,263.00 €**
	of the wage costs to	**25,010.00 €**
Cost savings		**506,003.00 €**
In addition, Reduction:	of hydraulic failures to	3,238 h
	of the total downtime to	19,488 h
Increase in availability to		**92.20 %**

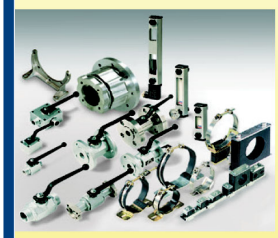

Accumulator Technology 30.000


Filter Technology 70.000


Process Technology 77.000


Filter Systems 79.000


Compact Hydraulics 53.000


Accessories 61.000


Electronics 180.000


Cooling Systems 57.000

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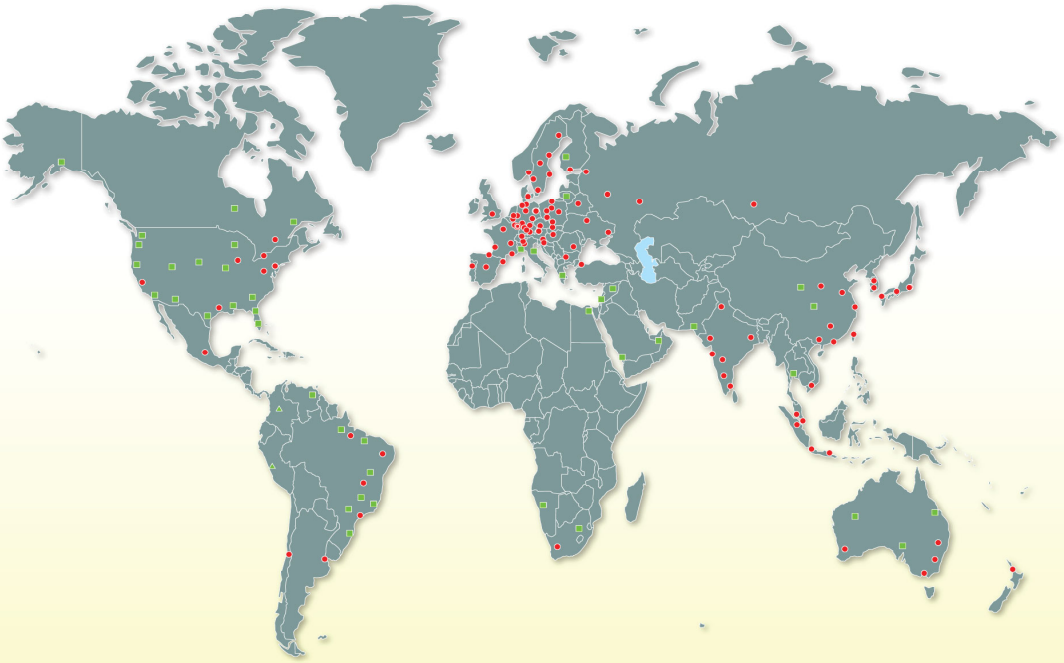

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- HYDAC Companies
- HYDAC Sales and Service Partners
- Free Sales Partners

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