



OVIVO[®]
Bringing water to life[®]

Water Specialist for the Oil & Gas Sector
creating value in water through innovation, creativity and expertise

ovivowater.com

Ovivo: A market Leader

As society and the global economy demand more and more from water, there is a growing requirement for ever more applications to manage clean water, to create specialist process waters, to treat wastewater, to extract energy from wastewater and to champion the reuse of water.

Many of the best known, most respected and reliable brand names in the water and wastewater industries are part of Ovivo's heritage. The combined strengths of our brands and talents, including Brackett Green, Caird & Rayner Clark, Christ Water Technology and Eimco Water Technologies create one of the most comprehensive bank of technologies in the sector, one of the most impressive list of references, and practical application knowledge.

Ovivo aims to become the water partner of choice for clients in the public and private sectors and the leading source of water expertise for engineers and consultants across the globe. Get in touch with some of the best brains in the business.

For further information, visit
ovivowater.com



Ovivo - creating value in water through innovation, creativity and expertise in clean water, process water, wastewater treatment, waste-to-energy and water reuse markets across 5 continents.



Ovivo - bringing water to life



Our Role in your Industry

Oil and gas are precious resources. As an integral element of oil and gas production, water management is especially important. Ovivo can help producers meet their challenging objectives of treating produced water for disposal or pressure maintenance to the surface or discharge overboard.

Ovivo can be relied upon to recommend the ideal processes, technologies and products to address your particular circumstances and meet your specific requirements. Ovivo offers a full spectrum of reliable equipment for handling produced water. Our offerings have been proven over a broad range of applications and years of rugged and reliable performance. The offering includes primary, secondary, and tertiary treatment solutions for a broad spectrum of upstream installations, whether it's onshore, fixed-offshore, or floating-offshore facilities (TLPs, Spars or FPSOs).

Ovivo develops and implements innovative solutions to meet the challenges of treating water and wastewater for the oil and gas industry, addressing both upstream and downstream applications. A broad range of technologies, coupled with expertise and dynamic track record help Ovivo determine the best solutions for its clients. As a flexible, dynamic company, Ovivo is able to provide turnkey solutions and commissioned, tailored designs for the fulfillment of major capital equipment projects. Across the world, wherever Ovivo is active, the systems it recommends and implements are designed to meet the specific needs of each project site and secure the best value from water for our clients.

Creating Value

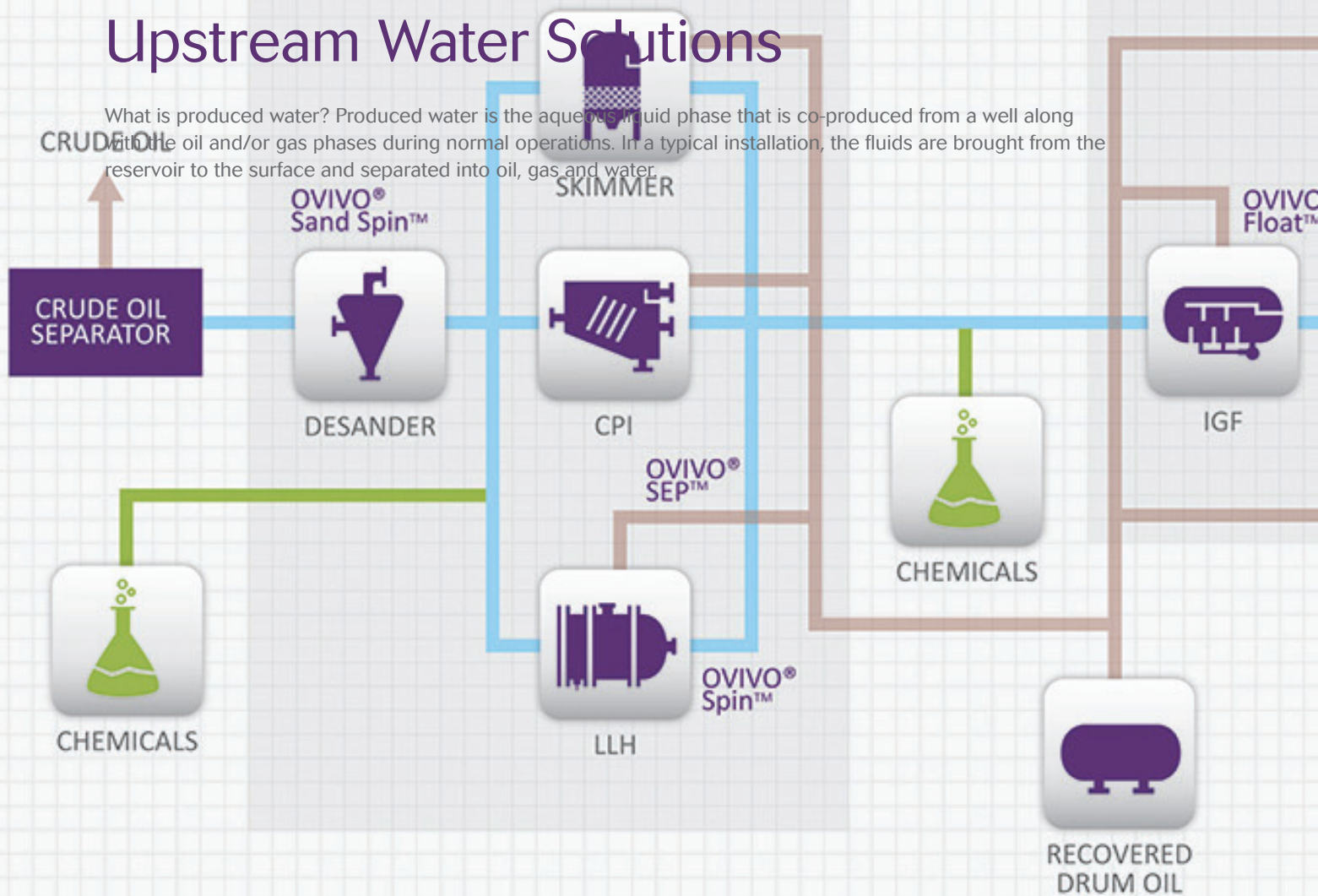


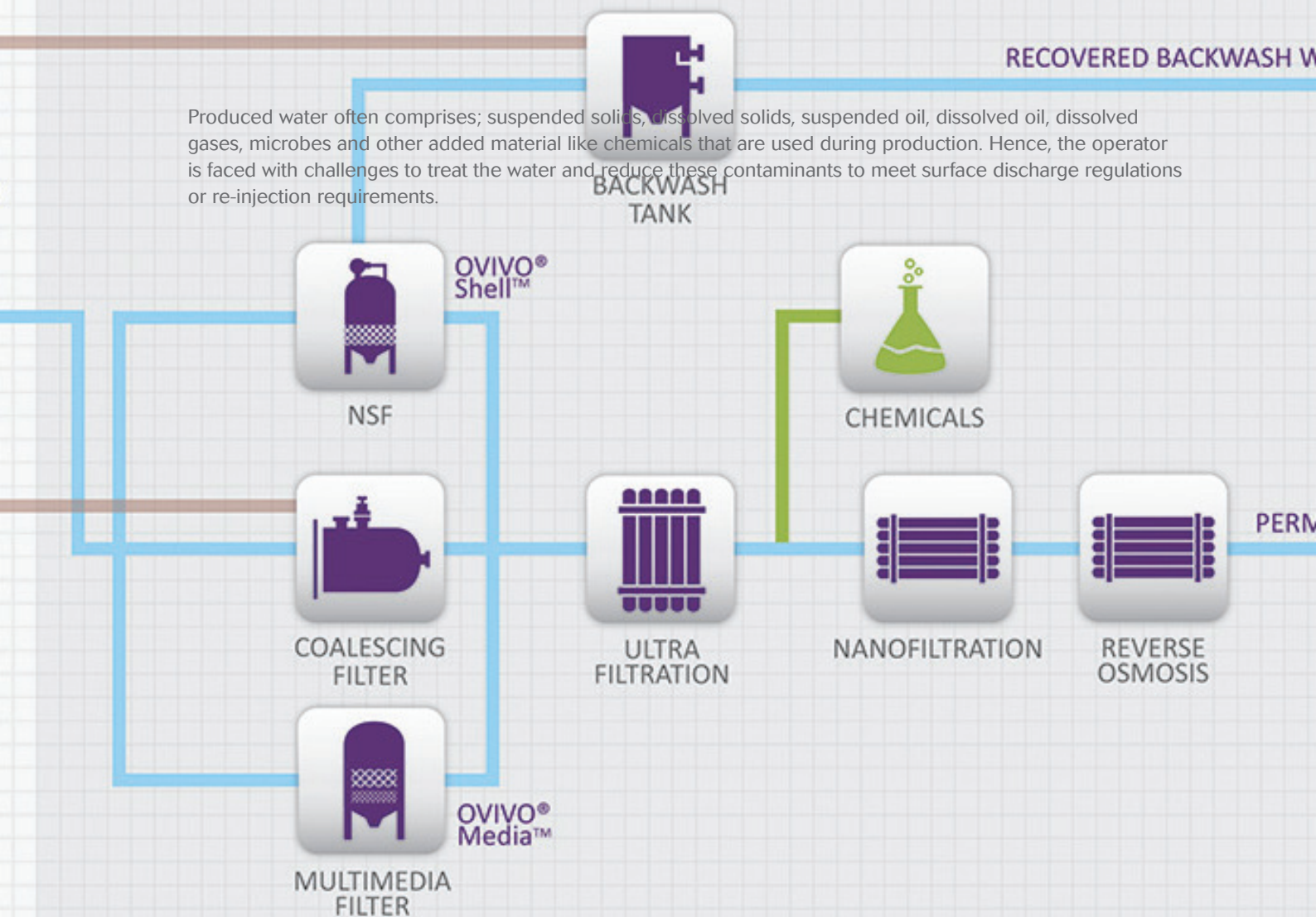
Bespoke compact and light water and wastewater packages for offshore duties are a specialty of Ovivo. Where every kilogram and square meter of footprint saved dramatically reduces in rig costs, our advanced technologies create real value.



Upstream Water Solutions

What is produced water? Produced water is the aqueous liquid phase that is co-produced from a well along with the oil and/or gas phases during normal operations. In a typical installation, the fluids are brought from the reservoir to the surface and separated into oil, gas and water.





Primary Treatment

In a typical crude oil production/separation, the crude oil from the production wells enters the production separator first, which is essentially a three (3) phase separator to remove the water and gas from the oil. Further treatment of the oil is carried out in the oil process train. The produced water from the crude oil separation train typically contains 500 – 2000 mg/l of free oil. The first step or primary treatment in produced water processing is to reduce the solids content if there is a high presence of solids which is followed by reduction of the oil content to below 500 mg/l by gravity separation using Liquid-Liquid Hydrocyclones, Skimmers, or CPI.

OVIVO® Sand Spin™ Solid-Liquid Hydrocyclones

Ovivo's portfolio of Desanding Hydrocyclones offers high efficiency removal of solids from produced water to protect downstream equipment. The solids, if not removed, can create downtime in produced water equipment due to erosion or blockage. Downtime results in higher maintenance costs and may result in interrupted oil production.

Ovivo designs are constructed in line with industry standards including ASME, ANSI and NACE. The Hydrocyclone design has no moving parts, yields minimal to zero liquid loss and has a steady pressure drop, usually 3 – 11 psi. OVIVO Sand Spin technology can be applied across a wide range of onshore or offshore applications. For produced water applications, typical efficiencies are 95% removal of 40 microns and larger particles and 50% for 1-20 microns particles. OVIVO Sand Spin technology desanders are designed with a two-to-one turn down ratio with flow rates ranging from 100 to 450,000 BWPD per unit. The OVIVO Sand Spin technology desanders offer the smallest weight and dimensions on the market making them attractive for offshore installations. They are easy to install and are reliable during start-ups and operation.

OVIVO® Spin™ Liquid-Liquid Hydrocyclones

Liquid-Liquid Hydrocyclones are more often than not, the primary separation equipment followed by Induced Gas Flotation (IGF) unit as secondary treatment for offshore installations. The OVIVO Spin line of Liquid-Liquid Hydrocyclones offers exceptional removal efficiencies of oil droplets 10 microns and larger. The probability of removing an oil droplet from the feed depends mainly upon the droplet diameter and the differential density between the two liquids. The larger the size and the differential density, the greater the separation efficiency.

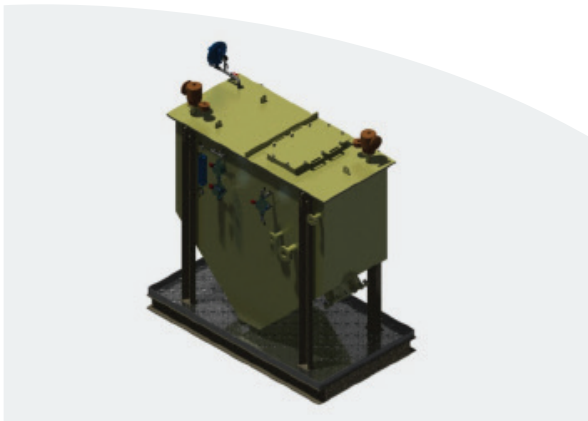


The individual hydrocyclones liners are installed within a pressure vessel and internally supported by tube plates. This arrangement allows easy access to all internal areas of the vessel for routine maintenance and inspection and also provides a compact design to suit offshore installations. The hydrocyclones liners may be easily withdrawn from the vessel and replaced with blanks to achieve further turndown if required. The OVIVO Spin system offers inherent reliability and has been designed to operate efficiently over a wide range of conditions, with reduced long term operating costs.

OVIVO® Skim™ Skimmer Vessels

The OVIVO Skim system offers a more compact vertical skimmer for off-shore installation. This design can also be adapted to serve as a produced water degassing vessel.

The OVIVO Skim technology provides an economical way to remove the bulk of the oil and contaminants. Horizontal designs are also available. Our range of skimmers are designed around separation of specified oil droplet size, typically 120-150 microns along with the allowable residence time. Horizontal designs can be supplied as atmospheric or pressurized vessels.



OVIVO® Sep™ Corrugated Plate Interceptors (CPI)

Ovivo offers two (2) designs of Corrugated Plate Interceptors (CPIs); the atmospheric design which is box type and the pressurized design which is fabricated in accordance with ASME VIII, Division 1 classification code. OVIVO Sep CPI separators are ideal for the separation, removal, and recovery of bulk oil and suspended solids from process water or wastewater streams. They provide an economical way to remove the bulk of the oil and contaminants and are most often the only separation equipment needed.

The OVIVO Sep equipment uses coalescing plate packs that induces small oil droplets to combine into larger, more easily separable droplets. The distributor plate spreads the flow evenly over the width and height of the plate packs. The individual plate packs are sloped to a 45° or 60° angle to minimize the possibility of sludge fouling.

The advantages of OVIVO Sep Corrugated Plate Separators over other gravity separators such as API pits, settling tanks, are:

- The vessel required is much smaller, resulting in lower capital and installation costs.
- Plate separator packs can remove smaller size droplets, resulting in better separation efficiency.
- Plate separator packs are fully enclosed and can be gas blanketed, eliminating emission of volatile organic compounds (VOCs) and reducing fire hazards.
- The 60° plate angle and 0.75-inch spacing allows for efficient removal of solids, resulting in less fouling.



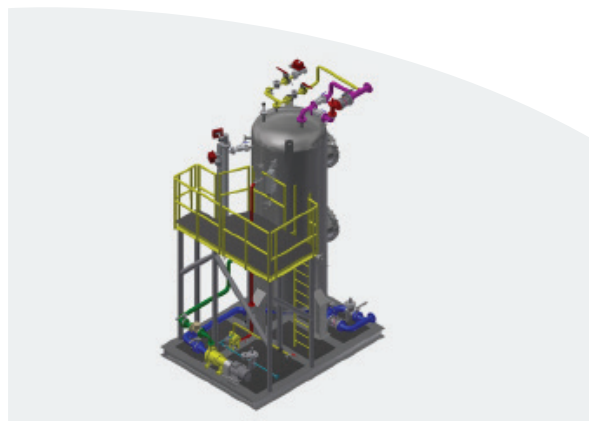
Secondary Treatment

In many upstream installations, most notably offshore, a secondary treatment step represents the final step where discharges of 20 – 29 ppm of free oil content are permissible. Ovivo offers vertical Induced Gas Flotation (IGF) units which are used, almost exclusively, for off-shore installations, where deck space is at a premium. Ovivo also offers multi-cell horizontal IGF units, which although prevalent on on-shore installations, can be adapted for off-shore application as well if required.

OVIVO® Float™ Induced Gas Flotation Units (IGF)

The Induced Gas Flotation (IGF) process involves introducing gas bubbles into the wastewater stream via a series of eductors. The gas bubbles are then released into the contact section of the vessel. The bubbles lift the entrained oil and solids which are then skimmed from the surface. The clarified effluent is discharged from the bottom of the vessel.

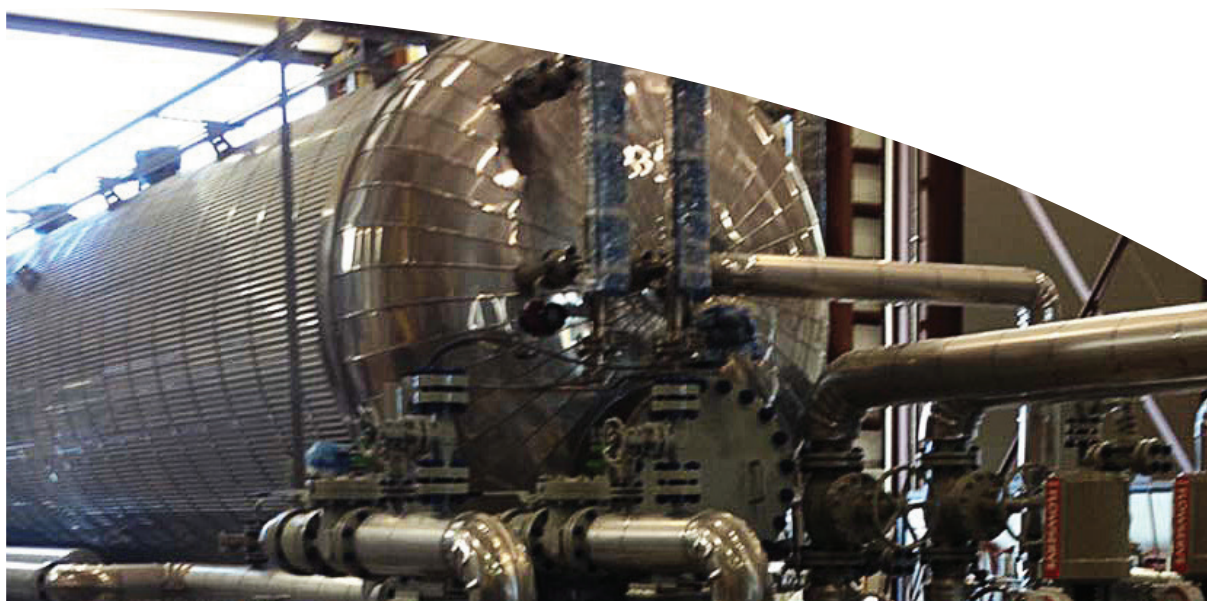
The OVIVO Float IGF design utilizes finely dispersed gas to reduce the apparent density of the oil and solids; increase droplets size and greatly improve buoyancy through coalescence.



Pressurized water passing through the eductor creates a vacuum at the gas suction port, whereby the gas is induced from the head space in the IGF Vessel and induced into the water stream.

This is essentially a closed loop with very low gas consumption such that make-up gas requirements are 0.25 to 0.5 scf per barrel of produced water treated.

Velocities through the eductor and disperser mechanisms are critical and must be maintained near constant flow for best efficiency. A pump is provided to recirculate clean water through the eductors to maintain optimum gas entrainment.



Tertiary Treatment

If further treatment of produced water is required to meet disposal regulations or injection water quality requirements, a tertiary step can be implemented to meet those goals. Ovivo offers a line of robust, industry standard, proven equipment.

OVIVO® Media™ Multimedia Filters

Where produced water treatment requires greater than 95% removal of 2-5 micron removal of both oil droplet and solids, Ovivo offers a line of OVIVO Media multimedia filters. These systems are fully automatic in operation requiring less operator intervention. In normal operation all filters run in parallel with all filters on-line, until the run terminates with each filter withdrawn on a cyclic basis to undergo backwash. Ovivo offers an air scour blower system as part of the media cleaning system to ensure that the media bed is fluidized to remove all trapped solids.

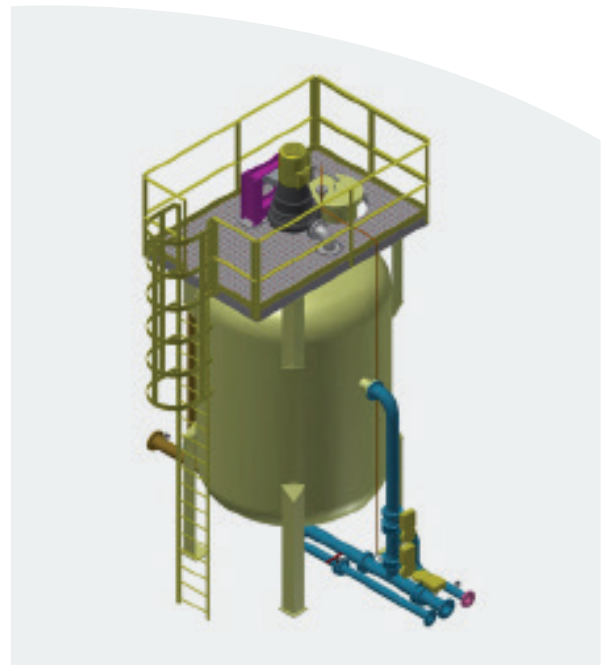
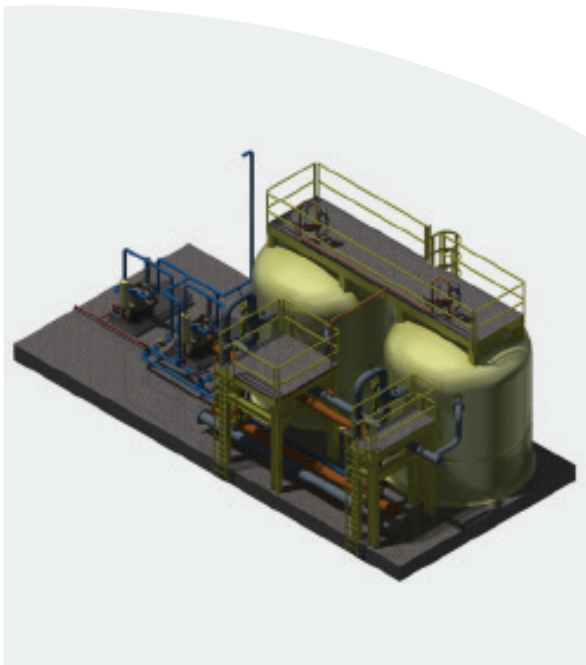
Ovivo uses a three (3) or four (4) media layer system depending on effluent water quality requirements. The use of different grades of filtration media allows a gradual coarse to fine media size to capture particles.

OVIVO® Shell™ Nutshell Filters

Similar to the OVIVO Media multimedia filters, the OVIVO Shell nutshell filters are media based filters. Nutshell filters are proven to remove greater than 98% removal of 5 micron oil droplet and solids.

The technology was developed more than thirty years ago with the objective of providing better filtration performance than conventional sand and mixed media filtration systems. An important characteristic of the walnut and pecan shell medium is its hydrophilic property which results in captured oil droplets having a greater tendency to remain in droplet form on the surface rather than coating the medium as is the case with other filtration media. Oil is trapped by adsorption within the fibers of the nutshells and solids are retained by entrapment between the nutshell particles.

The OVIVO Shell nutshell filter uses a specific blend of nutshells (Black Walnut, English Walnut and Pecan shells). The systems are fully automatic requiring less operator intervention. Normal filtration is down through the media bed.



Cartridge Filters / Coalescers

As part of the tertiary system or overall produced water treatment package, Ovivo can provide a cartridge filter/coalescer system. This system is typically provided as a polishing step to meet stringent requirements. Typical process guarantee for systems incorporating cartridge/coalescer system is 10 ppm or less of free oil in the final treated produced water effluent. The cartridge filters/coalesces are rarely supplied as stand-alone units.

Microfiltration & Ultrafiltration

Where even more stringent produced water effluent water quality is required i.e. surface discharge, or produced water that may be potentially used for irrigation or injection, Ovivo offers Microfiltration (MF) or Ultrafiltration (UF) units. These units may be followed by nanofiltration (NF) and/or Reverse Osmosis system if the process dictates.

Typical membranes used for Microfiltration and Ultrafiltration are hollow fiber type. MF has the largest pore size 0.1 to 1 microns and UF pore sizes range from 0.01 to 0.1 micron. Both designs can operate in Cross flow or dead end filtration mode.

The MF and UF systems are used to primarily remove suspended solids, bacteria and reduce turbidity.

Reverse Osmosis Systems

Reverse osmosis (RO) is a water purification process that uses a selectively semi-permeable membrane. In RO, pressure is applied to overcome osmotic pressure, a property that is governed by chemical potential, a thermodynamic parameter. The result is that the solute is retained on the pressurized side of the membrane and the pure solvent is allowed to the other side. Whereas MF and UF targets suspended solids, the RO targets dissolved ions.

Compared to other desalination technologies such as evaporators, RO does not require thermal energy. Ovivo can supply a fully functional automated RO system to complement a produced water package when required.

Chemical Dosing Systems

Ovivo can include chemical dosing systems as part of a produced water package. Most commonly used chemicals in produced water are the reverse demulsifier and flotation aid. Dosage rates and performance are set by chemical metering pumps. The metering pumps commonly used are diaphragm type conforming to API-675. Chemical dosing packages are rarely supplied as stand-alone units.



Fresh Water Maker

Ovivo has been supplying high quality fresh water maker and water treatment packages for the Petrochemical & Offshore industries for over 30 years. Our knowledge and understanding of the demanding requirements of offshore specifications include NORSOK, Statoil TR's & Shell DEP's.

Design features of Ovivo Offshore Reverse Osmosis packages are:

- Materials & Certification in accordance with project requirements
- Fabrication and NDT in accordance with project requirements
- Equipment layout optimised for operator accessibility
- Automatic remote operation and monitoring via platform control room
- Optimised process design to minimise package weight, footprint and energy consumption
- Minimised use of chemicals to keep environmental discharges low

- Use of nominated vendors for valves, instruments, rotating equipment, pipework flanges and fittings, etc.
- Atex rated packages for operation in hazardous areas

Each package is individually engineered to meet project specific requirements and ensure reliable operation for extended periods. This feature is becoming increasingly important as offshore locations are becoming more remote and are located in increasingly harsh environments.

Ovivo can also supply ancillary equipment such as UV sterilisers, chemical dosing packages, calorifiers, hydrophores and hot or cold water distribution packages

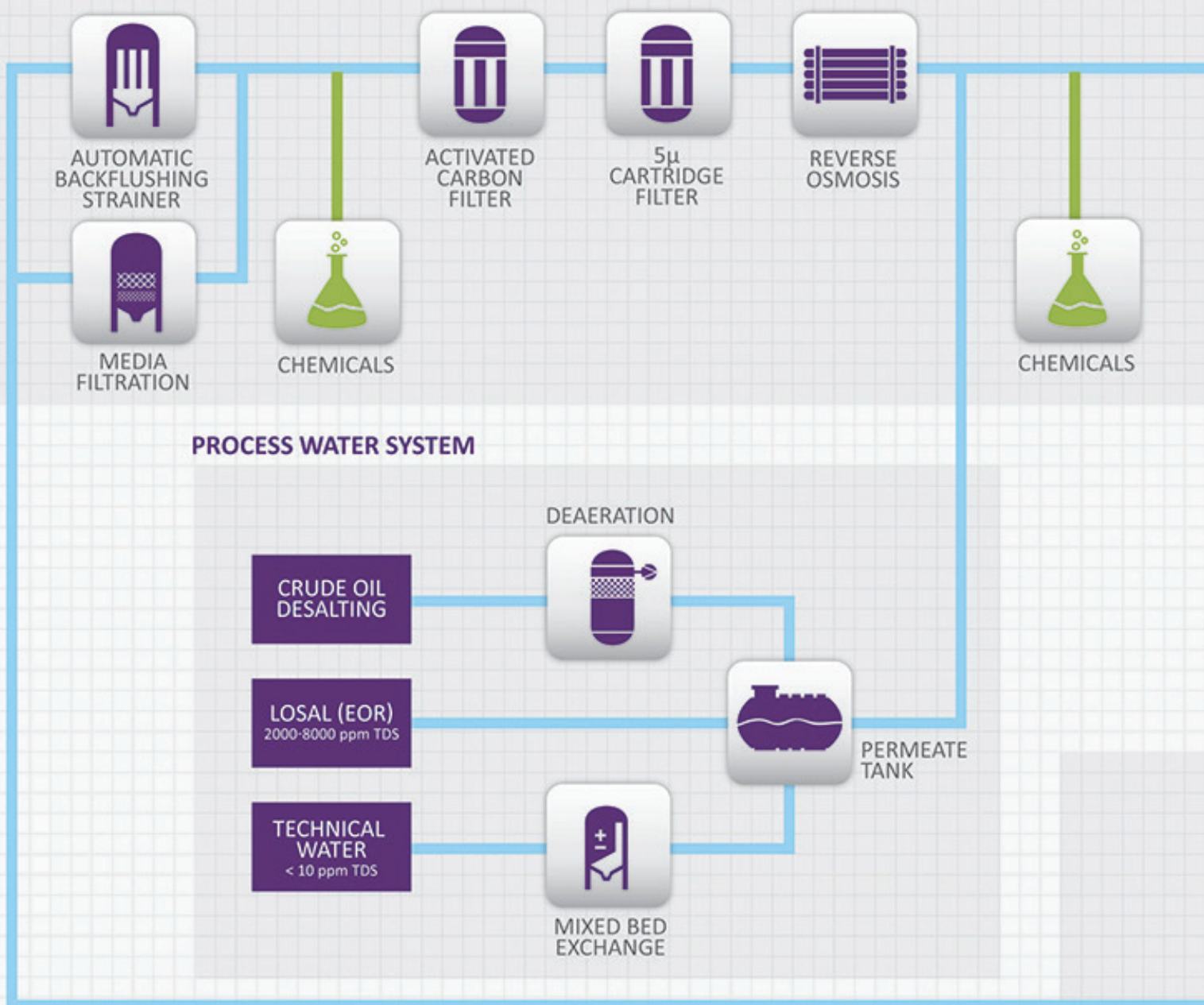
All Ovivo packages are supported by our aftersales network, that can provide spare parts, technical assistance for the commissioning of plant, operator training and service contracts.

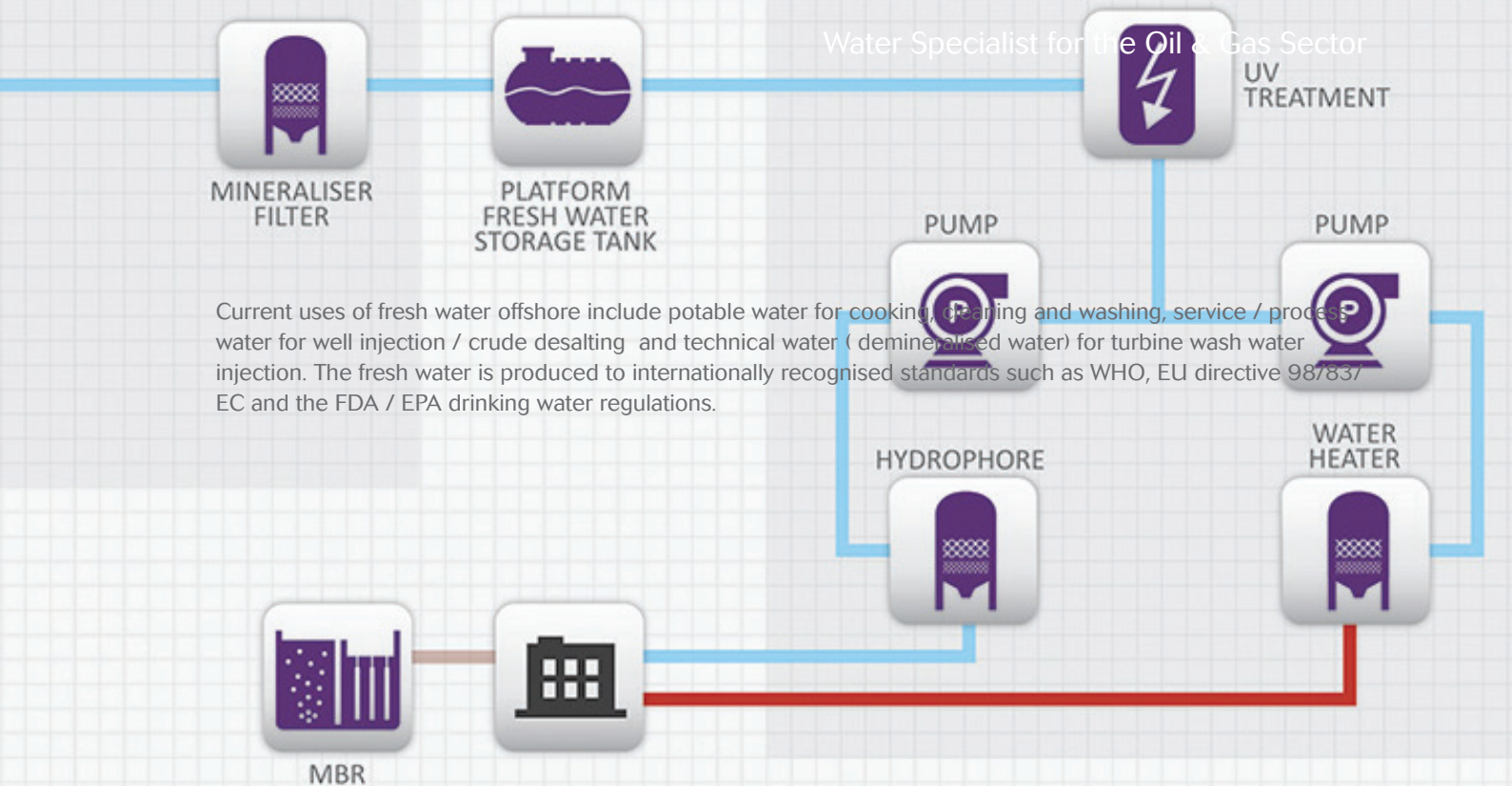


Fresh Water Maker

The availability of reliable sources of fresh water offshore is now recognised as being every bit as important as the main hydrocarbon processing equipment. Offshore platforms are increasingly having to operate in more remote locations and harsher environments where a reliable supply of fresh water from shore or via bunkering tankers cannot be guaranteed. With on board typical storage capacities of around a week, if the fresh water maker is out of service, platforms face the prospect of having to de-man and the consequent loss of hydrocarbon production.

FRESH WATER MAKER





SEAWATER INJECTION SYSTEM



Parts & Services

Ovivo takes a business-orientated view of total operating costs in water and wastewater. Each office can draw upon global best practices and in-depth application knowledge to ensure efficient and effective running of water solutions within clients' businesses.

At Ovivo we understand that water and wastewater treatment processes are not always simple operations, and therefore we can provide a dedicated team looking after your investment. Our specialist teams have extensive design experience, allowing monitoring, operation and support of your systems by personnel familiar with the workings of your equipment.

Our services provide our clients' with various levels of support, ranging from off-site remote support to 24/7 on-site operational support anywhere around the globe. This, coupled with our spares management and supply systems, allow for complete management of water and wastewater assets.

Ovivo teams worldwide can also test and confirm the operating capabilities of systems via regular inspections. Your local Ovivo team operates a quality system that conforms to ISO 9001 ensuring that:

- Communicating is as easy as possible.
- Local resources are used wherever possible.
- Costs are kept to a minimum.

Backed by a comprehensive telephone support service and spare parts supply agreement, Ovivo's commitment is to develop productive, long-term customer service relationships with every client. Its teams ensure that plants are kept in optimum condition, minimizing downtime for your business and enabling you to operate at optimal efficiency.

Capabilities:

- Upgrade existing equipment
- Rebuilds
- Turnkey projects
- Project management
- Labor & Service
- Field service
- Inspection of equipment
- Spare parts



Some Of Our Brands :



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