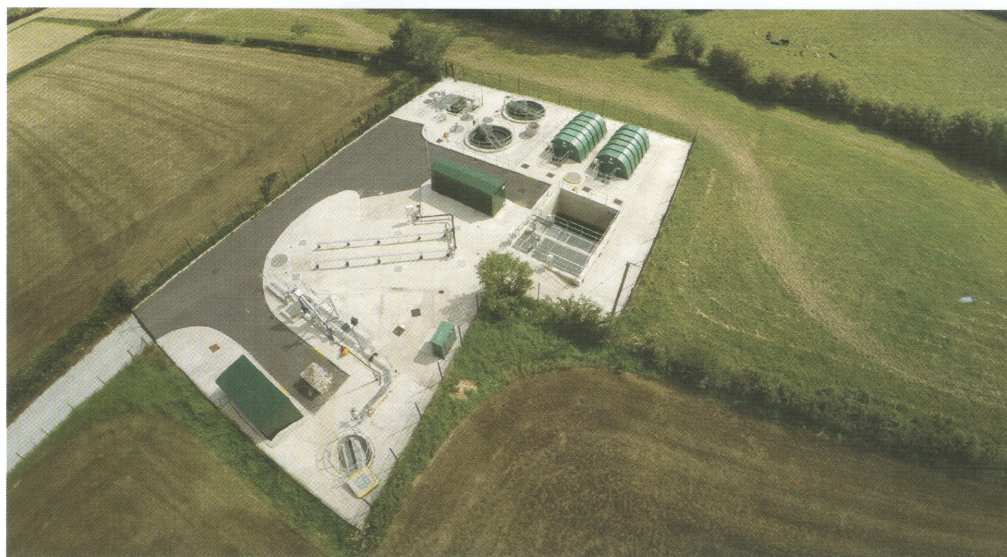


RBC or SAF - which do you prefer?

Rotating biological contactors (RBCs) and submerged aerated filters (SAFs) are both well-known, trusted wastewater treatment systems that are widely used across the UK and Ireland. Interestingly, water companies have tended to gravitate towards one system or the other, rather than incorporating a mix of both, for various historical reasons.



This separation appears logical as both solutions essentially perform the same task, removing BOD and ammonia from wastewaters for small populations of up to 3000 PE. However there are persuasive reasons why it is worth considering a mix of both, tailoring solutions for the situations to which they are best suited.

Taking RBCs as a starting point, these are effective, robust treatment systems with a large number of installed units across the world. Their key benefit is low power usage, which means that they are well suited to rural areas where the power supply may perhaps not be as robust as an urban system. Jacopa's RBC drive units have a 100,000-hour design life, and all mechanical parts are coated to WIMES specifications to reduce and simplify maintenance. Because of their method of installation, which normally requires a reception pit to be excavated, they are essentially permanent fixtures.

The low energy use also equates to low operating costs, and these systems also help to reduce the capital cost of wastewater treatment. They are a proven, reliable treatment process – Jacopa worked with leading design and operations experts to develop its RBC, to ensure robustness and dependability were built into the solution.

Jacopa's high-performance biological SAF units are the original SAF systems and this

November celebrates the 25th anniversary of the first SAF installation. They have a proven performance record with hundreds of installations throughout the global wastewater industry. The fixed-film Copa SAF has an immediate effect on BOD, and can be 100% effective within just four weeks of start-up.

SAFs are a very low maintenance option, as the only moving part is the blower in its separate GRP kiosk, and the packaged units themselves can be installed either below ground or above. The latter option has made them extremely popular as temporary installations, where they can extend the commercial life of failing or overloaded works, help support planned maintenance, reduce land use costs, and minimise discharge consent failures. The robust design and simple operation reduce both whole life and labour costs.

Installing the tanks above ground obviously reduces both civils costs and installation time, and whichever option is chosen, each tank has its own duty blower with a separate common standby unit. The blowers themselves are low-maintenance systems, needing replacement air filters just once every six months.

In all, around 500 of Jacopa's SAF tanks have been installed around the world. Scotland recently celebrated its 'century' with the 100th SAF

tank being delivered to Scottish Water's Dufftown wastewater treatment works. Dufftown is in Moray, in the heart of northern Scotland, and is probably most famous for producing more malt whisky than any other town in the country, earning it the justified title of "Whisky Capital of the World".

The CB750 Copa SAF was installed in collaboration with Prime Pumps Ltd and Scottish Water Operations. The upgrade was undertaken because of concerns about breaching the site's CAR (Water Environment (Controlled Activities) (Scotland) Regulations 2011) licence, which had already led to preventative chemical dosing being put in place. The Copa system was recommended as a long-term solution to help drive down the effluent BOD and ammonia levels. Since the SAF was installed, the site has been operating comfortably within its parameters and Scottish Water is reported to be delighted by the new addition to the works.

Jacopa were the first company to offer a SAF hire service back in 1996 and the SAF hire business has continued to grow ever since, providing a vital service to the UK water industry. To date over 180 Copa SAF systems have been hired to provide temporary treatment across the UK.

One example of the way in which hiring SAF units has become popular is Wessex

Water's Bruton wastewater treatment works. Here, Jacopa won a contract for six of the robust packaged CB750 Copa SAF-Hire treatment units for 26 weeks to provide temporary treatment during a planned filter bed refurbishment. The SAF-Hire units were installed within 1 week and reduced the ammonia in the wastewater to under 1.0mg/l just a few weeks after start-up.

SAF Hire is an increasingly popular strategic option where water companies need short-term wastewater treatment solutions that have an immediate effect on ammonia and BOD. The SAF provides great process flexibility and can be used as a permanent or temporary solution for BOD removal, for combined BOD and ammonia removal, for tertiary nitrification and as part of a denitrifying treatment system.

Jacopa's collaborative research with leading design and operations experts has led to a thorough understanding of the RBC process resulting in the design of a new generation of RBCs and water companies continue to use this system.

Water companies, including Wessex Water and Welsh Water also adopt this approach for some of their small rural sites. For example, a packaged RBC unit was recently supplied to the tiny Welsh village of Penisarwaun, four miles east of Caernarfon in Gwynedd, on the fringes of the Snowdonia

National Park.

The contractor was local company Dawnus, and the client was Welsh Water. The RBC unit caters for a future population equivalent of 544, and a dry weather flow of 111m³/day, crude BOD load of 32.6kg/day and ammoniacal nitrogen load of 4.4kg/day. The 95 percentile effluent quality to be achieved after final settlement is 40mg/l BOD, 60mg/l suspended solids and 28mg/l ammoniacal nitrogen.

Jacopa supplied the RBC with all fittings, including the biocontactor and airlift system to return sludge and scum to the primary settlement stage. The removable GRP covers, manufactured to BS4994, have a lockable inspection hatch and lockable door access at each end.

Normally built off site and delivered in one piece for rapid installation, Jacopa's RBCs are designed to ensure the lowest total expenditure and minimal operator intervention. There are several hundred of this proven, reliable treatment system in use, proving that when RBCs are properly specified, designed and constructed they are a very efficient Totex wastewater treatment solution for water companies.

Jacopa's research systematically investigated all components of its original design, down to the nuts and bolts,

which has resulted in an attractively-priced option with significant design improvements that ensure the solutions are both reliable and save costs on many aspects of installation and operation. As one example of Jacopa's optimisation, its standard RBC rotor is designed to withstand the eccentric loads created by partial drying out of the biomass after it has been stationary for up to eight hours.

Jacopa has both a standard range of RBCs that meet the requirements of the vast majority of customers and an ability to modify the system to meet any specification required. The company is also able to refurbish or repair old or defective RBCs supplied by any manufacturer and can manufacture and install new rotors into most existing RBC shells.

For Both SAF and RBC Jacopa offer a 'turnkey' service including, design delivery, offloading, mechanical and electrical installation and commissioning of the equipment.

Given the wide range of benefits and options available, it's clear that the choice of RBC or SAF very much depends on the individual requirements of a particular site. Jacopa therefore believe it is important to work with the customer to achieve the optimum solution for each individual situation.

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