



RK Plast manufactures high tech plastic components

Newly improved substrate for biofilters

The Danish plastics industry goes back to the start of the twentieth century, but it really took off in the thirties. Today the Danish plastics industry comprises some 500 companies employing 33,500 people and with an annual turnover of just under EUR6bn. Most of the industry produces highly specialised products of which 70% is exported.

One company that is perhaps typical of the Danish plastics industry is RK Plast. A medium-sized company based in Jutland that specialises in the manufacture of moulded plastic components RK Plast supplies a variety of industry segments. The company was established in 1984 and has supplied among others the security industry, ventilation and cooling companies, the

automobile, pharmaceutical, and food sectors, and even dentists with its products. Durable, tough, and available in a variety of colours the plastic components are made in a high-tech environment on plastic moulding machines that are equipped with robots or are automated in some way. The company has fifty machines at its disposal with sealing pressures that vary from 25 to 700 tonnes.

Biofilter removes ammonia from the system

In 2003 Robert Knudsen, an engineer by training and a key account manager with the company, developed a plastic substrate for use in biofilters in recirculation aquaculture systems. Biofilters are a necessary feature of recirculation systems as they remove the ammonia that comes from the meta-

The RK Bioelements are available in three variations, light, medium and heavy which have a density of 0.93, 1 or 1.20 g/cubic cm. The light and medium ones are used in up-flow and moving bed filters while the heavy one is intended for down-flow fixed bed filters.

bolic wastes produced by the fish by converting it into nitrites and nitrates before it can reach levels that are toxic to the fish. A biofilter usually consists of a substrate that provides a surface for the nitrifying bacteria and is submersed in a separate basin. The efficiency of the nitrification process is determined by the water flow, the relative surface area of the filter, the contact time between the filter and the water, the acidity of the water, and the quantity and quality of metabolic wastes produced by the fish. The biofilter is a living organism and for it to per-

form optimally it is necessary that the environment is stable without sudden and significant changes in the values of pH, temperature, light, amounts of metabolic waste produced, ammonia, oxygen content, or water flow.

The substrate developed at RK Plast has been christened RK BioElements and is a small finned plastic cylinder 15 mm by 15 mm with a relative surface area of 750 square m per cubic m of filter. In 2009 Mr Knudsen refined the product improving the water flow by making the design more open, but crucially, without compromising the surface area. "That was the difficult part," says Mr Knudsen, "because each time we tried to improve the water flow it cost us surface area. The challenge was to improve the flow without impacting the surface and now we have succeeded. In other words we have taken the best substrate on the market and made it better!" Improving the water flow enables the substrate to be moved around more easily in the filter which means less electricity is needed to move the water around thereby reducing costs. The RK BioElements are available in three variations, light, medium and heavy which have a density of 0.93, 1 or 1.20 g/cubic cm. The light and



The latest generation of the substrate has improved water flow characteristics yet maintained the surface area at 750 square / m³.

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Environmentally friendly product

The BioElements are made of polypropylene, a kind of plastic made from oil or natural gas that is so versatile that it finds applications in several industries including the food packaging industry. To achieve the right density the polypropylene is doped with small quantities of barium sulphate, an environmentally benign chemical.

So far most buyers have been from the Danish aquaculture sector, but the company has also had some success selling the product to fish farmers on the Faroe Islands, in Germany, Italy, the Czech Republic, and France. However, sales overseas have only really taken off in the last six months, before that Denmark was the main market. We have doubled our capacity for the bioelements from 1,500 cubic m per year to 3,000 cubic m per year, says Robert Knudsen, and we plan to systematically market these products outside Denmark by visiting and exhibiting at different trade fairs. The expansion in capacity has come despite the

economic and financial crisis which has tightened credit lines and other lending facilities and caused problems for farmers who want to invest. But the company is confident in the product and optimistic that the current situation will not persist and when companies start investing again it will be ready with the necessary volumes of the product.

Intellectual property belongs to the company

Currently the Bioelements are still a niche product contributing 10-15% of the company's annual turnover. However, what makes this product different from the other items that the company makes, is that the Bioelements have been designed and developed in-house and the intellectual property belongs to RK Plast. All the other work that is done by the company is based on other companies' designs and patents. The company is constantly working on improving the product and Robert Knudsen expects a further improved version to appear on the market in another two years or so. We keep a close eye on what is happening in the regulatory area as our products are closely linked to rules and regulations governing the environment. ■

RK Plast Company Fact File

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Key Account Manager:
 Robert Knudsen
Employees: 50

Facilities: Fifty injection moulding machines with sealing pressures from 25 to 700 tonnes
Products: Moulded plastic products for security industry, ventilation and cooling companies, the automobile, pharmaceutical, and food sectors, and dentists
Customers: Fish farmers
Markets: Denmark, Faroe Islands, in Germany, Italy, the Czech Republic, France

For Sale

Very successful seafood import business, established in 1982.

Location: Hamburg, Germany.

Best relationship to all levels of trading. Also perfect for companies, wanting to establish a branch office in Germany.

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