



WORLD WIDE WEAVE

GKD: Innovative filter media for the water industry

High-tech meshes increase ecological and economic efficiency

What started back in 1932 with the invention of the 5-Heddle Atlas Weave by technical weavers GKD – Gebr. Kufferath AG (GKD) is currently enjoying a new highlight with the Porometric meshes. Unsurpassed anywhere in the world in terms of cleaning, flow rate, dirt holding capacity, and service life, the three-dimensional structure of this filter medium is revolutionizing municipal and industrial water treatment operations. Whether for filtering out microorganisms, preparing service and process water for use in industrial circuits, or producing fresh water: GKD has been making a key contribution to the ecological and economic efficiency of waste water treatment plants for many years with high-tech filter media such as its Porometric mesh.

It all started with the idea of developing a filter medium which does not actually do the filtering itself, but rather transfers this task to the filter cake on the surface of the mesh. It marks the beginning of GKD's success story as a creative solution partner for the municipal and industrial water industry. The 5-Heddle Atlas Weave developed back then – also known under the name Tela – is still in use in the water treatment sector to this day. As an expert in all kinds of filtration tasks and a development partner in numerous research projects for sustainable water treatment, GKD is in demand worldwide. The company's broad product range forms the basis for this leading position in the fields of process water, ballast water, and waste water filtration. High-performance meshes, mesh laminates, and filter elements with filtration rates from 6 to 1,000 μm , as well as an unusually broad range of weavable materials regularly set new standards in the field of water treatment. Whether



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designs produced from high-grade stainless steel with 24 μm pore size for micro sieving or ballast water filtration, weaves produced from saltwater-proof materials such as Monel (2.4360) or Super Duplex (1.4410) with 35 μm pores, or maritime material combinations with pore sizes of 20 μm : the meshes are designed to handle specific processes and offer tailor-made resistance to corrosion, chloride ions, and heat. GKD employs experimental and computational simulation methods to select the optimum design from its diverse portfolio of products, materials, filtration rates, and flow rates for the specific customer and application. During continuous further development of the meshes, the filtration experts focus in particular on pore geometry as a way of adjusting the flow rate, mechanical stability, and performance of the woven structures to new requirements. Thanks to the close networking of the Engineering, Development, and Production departments under one roof, GKD regularly creates new and innovative weaves – special fabrics with exceptional characteristics for groundbreaking key applications in the water treatment sector. Beside municipal waste water treatment operations, sectors that already rely on these filter media also include the automotive, chemicals, household appliance, food, leather, and paper industries, as well as fish farms, golf courses, power plants, quarries, mining companies, and shipping enterprises.

Design-based edge for greater flow rate and selectivity

In these challenging environments, two mesh ranges have been shown to deliver particularly high performance thanks to their special designs: Optimized Dutch Weaves and Porometric Weaves. Optimized Dutch Weaves (ODW) achieve pore sizes in line with the German Institute of Mechanical Process Engineering (IMVT) with selectivity from 6 to 100 μm . Maintaining the same aperture, their mesh design with slot-shaped pores on the mesh surface and larger pores within the mesh significantly increases the flow rate. A low clogging tendency, coupled with high permeability, mechanical



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strength, a high dirt holding capacity, and good cleaning characteristics make the single-layer mesh the key success factor in numerous exacting processes. This range of properties is, for example, in great demand in the field of ballast water filtration, where Optimized Dutch Weaves with filtration rates of 50 μm or finer make a key contribution to achieving the requisite process efficiency. The mesh type has also been in use and proven over many years as preliminary filtration in municipal waste water treatment. New versions with filtration rates in the micro-filtration range combine the same high flow rate with extreme separation rates for large-scale water treatment. With its woven pore size of 5 μm , this mesh type for example minimizes entry of microplastics into urban waters by filtering the outlet water from sewage plants. Compared with the Optimized Dutch Weaves typically used here, which employ a pore size of 20 μm (ODW 20) and are already considered high-performance, ODW 6 reduces the solid content in the outlet water by 50 percent. As such, the solid content of two milligrams per liter of dirt load when using disc filters fitted with ODW 20 is reduced to just one milligram per liter of dirt load when using ODW 6 at the same flow rate. Despite their excellent separation rates, the pores in the ODW 6 boast excellent mechanical stability. This is thanks to the significantly higher number of stainless steel wires on the surface.

3D structure for extreme efficiency

With the Porometric range of meshes – a further development of Optimized Dutch Weaves – GKD has added yet another chapter in the history of pioneering innovations for water treatment. Boasting pore sizes from 13 to 1,000 μm , these high-tech weaves are also suitable for a large number of treatment processes in the water industry. Its three-dimensional slit structure with over 80 percent porosity increases the flow rate by up to 40 percent over Optimized Dutch Weaves. At the same time, the woven 3D structure also delivers a further improved dirt holding capacity, meaning that the number of



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cleaning cycles can actually be reduced despite the increased filtration performance. The excellent cleaning characteristics of Optimized Dutch Weaves and Porometric mesh were also scientifically certified in independent comparative studies performed by the Karlsruhe Institute of Technology (KIT). Demonstrating complete filter cake discharge at the lowest backwashing rate and residue-free regeneration, Porometric filter media delivered by far the best results of all metal and synthetic meshes tested at the KIT. The benefits associated with the 3D structure employed by Porometric mesh deliver excellent process efficiency, particularly in ballast water filtration applications. The higher flow rate achieved in the same size filter is ideal for all applications where space is at a premium. The refined particle retention also reduces costs in the downstream UV treatment process. All saltwater-proof Porometric designs – whether material combinations or produced from metals such as Monel and Super Duplex – have PREN values in excess of 40. They surpass all other filter media available in the market for ballast water treatment in terms of cleaning characteristics, flow rate, and particle retention. This range of properties has helped establish Porometric meshes as the leading filter media for reliably complying with the D2 Standard that is stipulated globally by the International Maritime Organization (IMO), as well as gaining the significantly stricter U.S. Coast Guard (USCG) certification.

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GKD – WORLD WIDE WEAVE

As a privately owned technical weaver, GKD - Gebr. Kufferath AG is the world market leader in metal, synthetic and spiral mesh solutions. Four independent business divisions bundle their expertise under one roof: Industrial Mesh (woven metal mesh and filter solutions), Process Belts (belts made of mesh and spirals), Architectural meshes (façades, safety and



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interior design made of metal fabrics) and Mediamesh[®] (Transparent media façades). With its headquarter in Germany and five other facilities in the US, South Africa, China, India and Chile – as well as its branches in France, Spain, Dubai and worldwide representatives, GKD is close to markets anywhere in the world.

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