WORLD WIDE WEAVE

Disc filters as an efficient alternative to sand filters

New mesh construction combines 6µm filtration rate with high throughput and optimal backwashing

In both industrial and municipal water processing, effective methods for the quantitative and qualitative securing of the water supply are crucial. The key factors for success here are compliance with the increasingly stringent requirements regarding environmental protection and the conservation of natural resources, the full utilisation of cost reduction potentials, and, of course, the reliability of wastewater treatment processes. This calls for technologies that, through the creation of closed water cycles, ensure both sustainability and, at the same time, cost-efficiency. No wonder, then, that leading manufacturers of filtration equipment for the mechanical processing of surface water, wastewater and seawater have been searching for filter media that offer a genuine alternative to conventional sand filter systems. Their expectations are correspondingly high: the development of ultrafine filter media for hydrostatic filtration which, at a high throughput rate, separates 99% of all particles > than 6 µm. A worthy challenge for GKD – Gebr. Kufferath AG, a global technology leader in the field of application-specifically optimised filter media. And this long-standing and proven provider has come up with a solution that fits the bill perfectly: a 6 µm flow-optimised Plain Dutch Weave mesh called ODW 6, which, without any changes to the size of the mesh openings, achieves a 25 percent higher flow rate. This innovative woven stainless steel wire mesh construction offers an optimal combination of long-term accuracy of filtration rate in the microfiltration range with high permeability, long service life and excellent backwash capability.

Whether for the processing of service and process water for use in industrial water cycles or for the processing of surface water for drinking water production, the same applies: the requirements on the filtration of pre-treated wastewater form industrial or municipal purification plants are becoming more and more stringent. The fineness of the particles to be separated, the residual solids content and the throughput rate are all key indicators for the efficiency of mechanical wastewater treatment. Disc filters for the separation of ultrafine particles enable the kind of practically solids-free processing that the strict standards for the discharge quality of water from treatment plants prescribe. Water purified to these specifications can be used, without further processing, for the irrigation of fields and parks. Alternatively, the ultrafine filtration stage may be followed by further downstream treatment stages, for example UV-treatment or membrane filtration. In the industrial sector, in addition to fulfilling the increasing quality standards for process and service water, disc filters also enable recyclable materials to be retrieved from the wastewater. They also meet the increasing demand for the reliable separation of the microorganisms contained in untreated water sourced directly from nearby rivers or streams. Another increasingly important area of use for these filters is in the desalination of seawater and brackish water for freshwater production for the industrial sector. In seawater treatment, disc filters are deployed upstream from cartridge and membrane filtration stages.

The search for an alternative

GKD has been supplying filter manufacturers with fine filtration meshes for customised separation of fine particles since 2006, so they were a logical choice of partner for the development of a new grade of filter media with unprecedented properties. The main objective was to create an ultrafine mesh for mechanical wastewater treatment that would increase retention of total suspended solids (TSS) in the microfiltration range and at the same

time reduce the turbidity level (Nephelometric Turbidity Units, NTU) and the concentration of algae. Further specifications that the new type of filter media was expected to fulfil included resistance to the influence of chemicals and high temperatures as well as good cleaning properties. And all this was combined with the challenge of guaranteeing a high water flow rate during hydrostatic filtration in spite of the ultrafine separation rate. Previously, only sand filters could fulfil such a task, as no filter media with the required characteristics for mechanical filtration existed. Now, disc filters in continuous operation – and with integrated backwashing – are purifying huge quantities of wastewater, and offering conventional sand filters some serious competition.

Target-oriented mesh simulation

Once they had received the customer specifications, the experts at GKD's **SOLID**WEAVE business unit got started with target-oriented simulations of a range of mesh constructions. This involved combining the geometric pore size, calculated according to the IMVT formula, with the simulation of flow and filtration processes. This enabled them to analyse the respective filtration mechanisms per 3D visualisation. Additional pressure differential estimates allowed the project team to draw important further conclusions relevant to the selection of the appropriate filter media. After determining the mesh type and specification, sample weaves were produced on the company's own ultramodern technical looms and tested intensively in the laboratory.

Ultrafine and highly permeable

The basis for the new mesh construction is the woven stainless steel wire mesh Optimised Plain Dutch Weave (ODW), a mesh type that has already proven itself repeatedly in countless filtration processes. Its special weave

creates rectangular, slot-shaped pores on the mesh surface that are smaller than the pores inside the mesh. This ensures that particles above the specified cut point are reliably separated on the mesh surface. The special pore geometry has the effect that many particles are separated next to each other at each pore, which explains the high dirt-holding capacity of the mesh and, at the same time, its very low flow resistance. In a very short time, a filter cake develops that further improves the retention rate. Particles below the cut point pass freely through the inner pores of the mesh, which is why ODWs have a very low tendency to clog. Through targeted modification and further development of this proven mesh construction, GKD's filtration experts succeeded in creating a new type of filter media with the unprecedented pore size of just 6 µm and – in comparison to the currently available products of competitors – a three times higher flow rate. Compared to conventional ultrafine meshes, this specific weave features substantially more stainless steel wires on its surface. This is the reason for the extraordinary stability of the individual pores and the overall mechanical strength of the ODW 6 mesh.

Successful in operation

GKD then tested the mesh in intensive field trials to ensure that it complied reliably with the specified filtration and flow rates. Here, too, the single-layer construction of the ODW gave a convincing performance across the board in terms of its filtration rate in the microfiltration range, its good regeneration capacity and its low tendency to clog. That marked the green light for standardised production of the innovative mesh construction. The tests also demonstrated that the high filtration performance of the ODW 6 can also improved the throughput capacity of downstream membrane filtration and the efficiency of UV systems in wastewater treatment. In the treatment of seawater, the ODW 6 also promises to help increase the flow capacity in the

membrane filtration stage and thus to protect the membranes. Here, too, the unique performance spectrum of the new mesh qualifies it as a viable replacement option for sand filters that will noticeably reduce the load on downstream treatment stages. Thanks to the considerably lower counter-pressure of the ODW 6 compared to conventional ultrafine meshes, the new mesh facilitates the same throughout with a smaller filter surface area, or a higher throughput with the same filter surface area. And the first balance drawn by the filter manufacturers themselves is very positive. Thanks to its porous structure, the flow-optimised 6 µm ODW mesh combines an excellent flow rate with significantly finer filtration rates and thus offers a long-awaited alternative to sand filters in the water treatment sector.

8.516 characters incl. spaces

GKD – GEBR. KUFFERATH AG

The owner-run technical weaver GKD – GEBR. KUFFERATH AG is the global market leader for metal and plastic woven solutions. Under the umbrella of GKD – WORLD WIDE WEAVE the company combines four independent business units: SOLID WEAVE (industrial meshes), WEAVE IN MOTION (process belt meshes), CREATIVE WEAVE (architectural meshes) and COMPACT FILTRATION (compact filter systems). With its seven plants – including the headquarters in Germany and other facilities in the US, Great Britain, South Africa, China, India and Chile – as well as its branches in France, Spain, Dubai, Qatar and worldwide representatives, GKD is never far from its customers.

For more information:
GKD – GEBR. KUFFERATH AG
Metallweberstraße 46
D-52353 Düren
Tel.: +49 (0) 2421 / 803-0
Fax: +49 (0) 2421 / 803-233
E-mail: solidweave@gkd.de
www.gkd.de

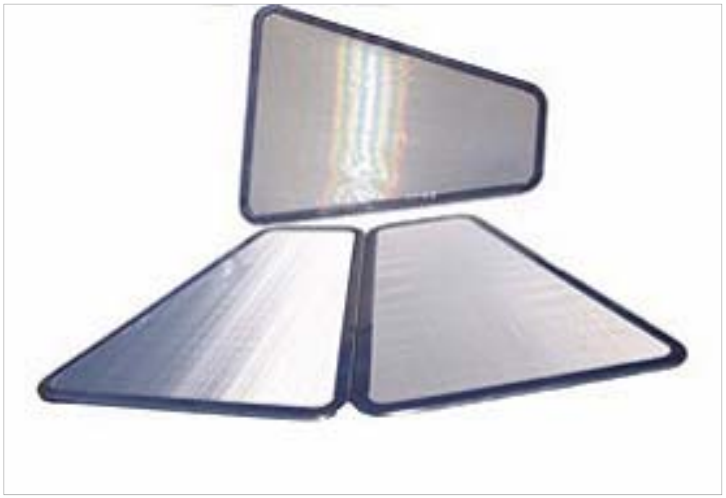
Please send a reprint to:
impetus.PR
Ursula Herrling-Tusch
Charlottenburger Allee 27-29
D-52068 Aachen
Tel.: +49 (0) 241 / 189 25-10
Fax: +49 (0) 241 / 189 25-29
E-mail: herrling-tusch@impetus-pr.de

Disc filters as an efficient alternative to sand filters

GKD: New mesh construction combines 6µm filtration rate with high throughput and optimal backwashing

Picture 1: Disc filter for micro-screening

Picture 2: Installed ODW 10µm filter elements



Picture 3: ODW filter elements

Picture 4: Filter in a sewage treatment plant

Picture 1-7 © GKD

We will be happy to send you the desired images in printable resolution by e-mail.

These images are meant exclusively for use in connection with this particular press release on the company GKD – GEBR. KUFFERATH AG. Any other use beyond this expressed purpose, especially use in connection with other companies, is strictly prohibited.

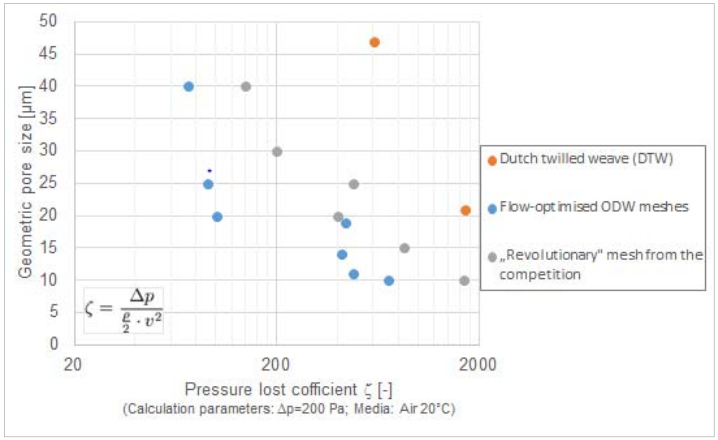
impetus.PR
Agentur für Corporate Communications GmbH

Ursula Herrling-Tusch
Charlottenburger Allee 27-29
D-52068 Aachen
Tel: +49 [0] 241 / 1 89 25-10
Fax: +49 [0] 241 / 1 89 25-29
E-Mail: herrling-tusch@impetus-pr.de

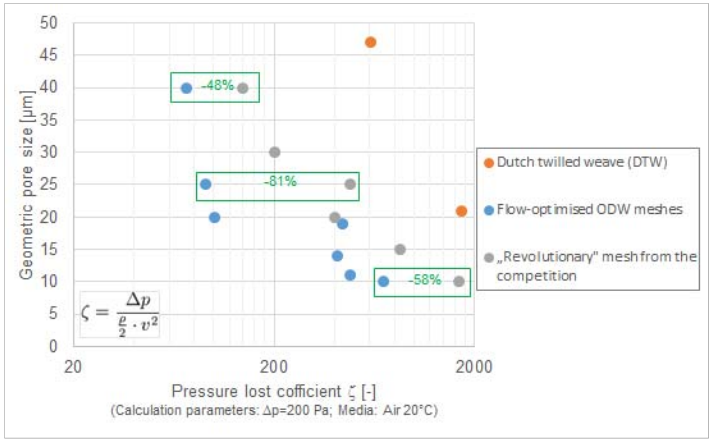
Disc filters as an efficient alternative to sand filters

GKD: New mesh construction combines 6µm filtration rate with high throughput and optimal backwashing

Picture 5: screening and filtration segment



Picture 6: The flow-optimised ODW meshes combine long-term reliability of filtration rates in the microfiltration range with almost three times higher throughput rates than the "revolutionary" innovations recently presented on the market.



Picture 7: The throughput is possible due to a specific mesh construction with an 8.5-times lower pressure loss coefficient than the products currently being offered by the competition.

We will be happy to send you the desired images in printable resolution by e-mail.

impetus.PR
Agentur für Corporate Communications GmbH

Ursula Herrling-Tusch
Charlottenburger Allee 27-29
D-52068 Aachen
Tel: +49 [0] 241 / 1 89 25-10
Fax: +49 [0] 241 / 1 89 25-29
E-Mail: herrling-tusch@impetus-pr.de