BOLLFILTER
Protection Systems

Membrane Filtration Solutions for Exhaust Gas Recirculation (EGR) and intelligent Control by Exhaust Recycling (iCER)

Filtration specialist for the maritime industry

BOLL & KIRCH offers tailor-made filtration solutions for Exhaust Gas Recirculation (EGR) according to the International Maritime Organization (IMO) criteria, suited to remove sulphur and particles from the bleed-off water which may harm diesel-marine engines.

Membrane solutions for reliable EGR bleed-off water treatment processes

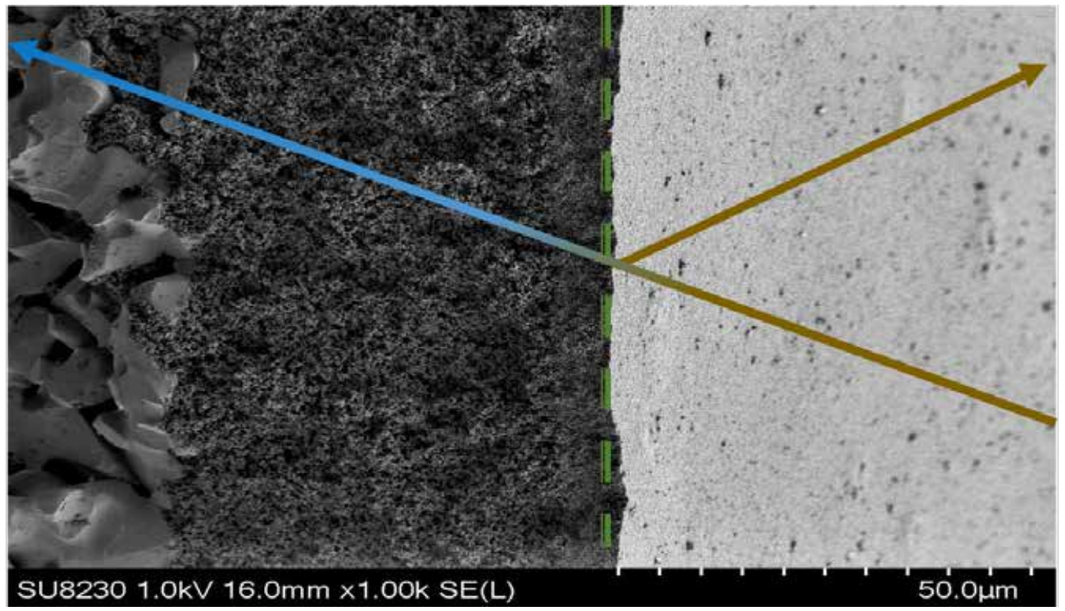
BOLL & KIRCH knows about customers demand and delivers the best benefits for your EGR treatment process. The tailored solution is called **BOLL FineFilterUnit**. As a fully automated system, the BOLL FineFilterUnit cleans bleed-off water and removes suspended particles to be finally collected as a concentrated sludge or solid component, based on advanced membrane technology.

Applicable Water Treatmen Unit for EGR Systems by MAN & iCER Systems by WinGD

Membrane filtration in compliance with regulation for bleed-off water - IMO MEPC.307(73)

Permeate according to IMO MEPC.307(73)

Sludge consisting of particles, carbon black and lipids



SEM picture of the ceramic membrane with a schematic illustration of the bleed-off water treatment

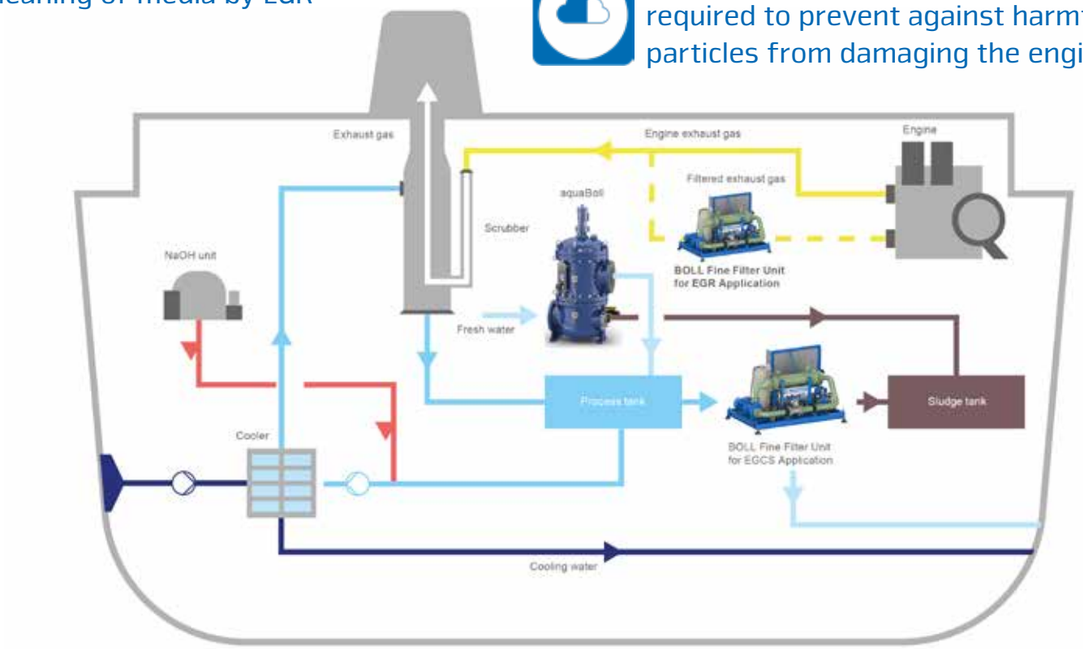
The BOLL FineFilterUnit ensures the discharge criteria according to the guidelines for exhaust gas recirculating IMO MEPC.307(73) in a complete manner.
Furthermore, we strive to protect your complete EGR system through sustainable improvements in order to provide you continuous and trouble-free operation through our treatment application.

Background and task

BOLL FineFilterUnit for engine protection

Cleaning of media by EGR

Cleaned recirculated exhaust gas is required to prevent against harmful particles from damaging the engine



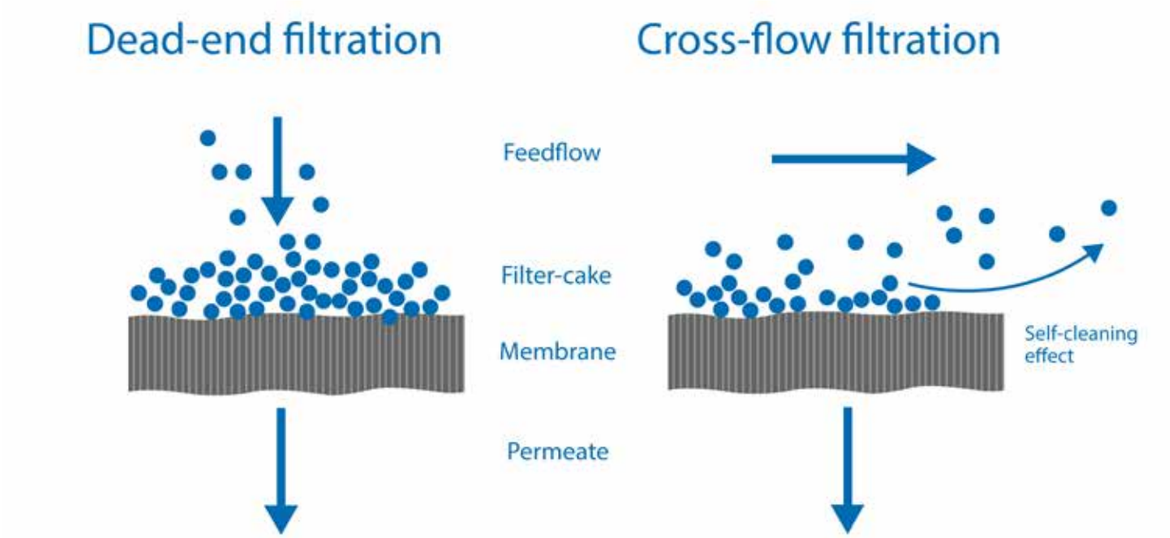
Water treatment system to clean, cool and neutralize the exhaust gas

Bleed-Off Water Treatment with BOLL FineFilterUnit

The BOLL FineFilterUnit is a fully automated system; controlled and monitored by a Programmable Logic Controller (PLC) enabling the continuity of the separation process with limited maintenance. It offers a high and reliable filtration flux of bleed-off water coming from process tanks and does not alter its pH value. The BOLL FineFilterUnit is designed to operate as stand-alone unit and does not necessarily need further process steps e.g. a Sludge Treatment Unit (STU) for post-treatment.

Advantages of cross-flow filtration

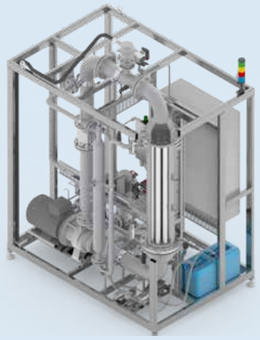
The operating principle of the BOLL FineFilterUnit is based on cross-flow filtration. In comparison to the alternative operating principle dead-end-filtration, the feed flow of the bleed-off water moves tangentially across the surface of the membrane. This minimizes particle deposition on the membrane and enables high sludge concentrations, ensuring a high operational time, while performing at a prolonged permeate flux rate up to 250 L/(m²h).



Schematic illustration of membrane filtration processes

The main advantage of cross-flow filtration is the self-cleaning effect. Through the tangential feed flow, the filter cake is continuously removed and thus ensuring the operational time of the membrane. Additionally, the membrane surface and the loop itself are cleaned by a CIP-liquid composed of a mixture of water and our in-house developed cleaning agent BOLL CLEAN. Depending on the feed composition and the operation of the unit, the cleaning liquid stored in the CIP-tank can be reused several times. The cleaning process will be executed on demand or automatically after a set time of operation.

Product features and benefits



- TSS: 0 – 2500 mg/L
- pH: 5.5 – 8.0
- T: 30 – 60°C (adjustable)

- Treatment capacity:
  - » 1 – 15m³/h
  - » Flux with up to 250 L/(m²h)

No use of chemicals during the pre-treatment and the filtration process

- Focculants are not required
- Sludge Treatment Unit not necessary due to low sludge generation:
  - » 2.5% of treated water
  - » Sludge solid content 10%

- Low maintenance due to continuous membrane surface cleaning through cross-flow operating principle
- Fast process start phase: <1min

- 100 % compliance with the IMO regulation MEPC.307(73) for treated bleed-off water discharge
- Compatible with our EGCS application solution according to IMO MEPC.340(77)
- WinGD Supplier Approval for WinGD 2-strokes DF engines
- MAN approved

- Easy retrofit due to small and efficient skid footprint
- Modular design enabling variable membrane sizing from 1-15 m³/h
- Defined and stabile separation process despite dynamic process parameters
- Inclusive compliance monitoring

- 70 years of experience in the maritime sector
- Own R&D network, expertise and license for scrubber MAN and WinGD Engines

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Contact:

Boll & Kirch Filterbau GmbH
Siemensstraße 10 – 14
50170 Kerpen

Telefon: +49 2273 562 424
E-mail: info@bollfilter.com
www.bollfilter.com

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