

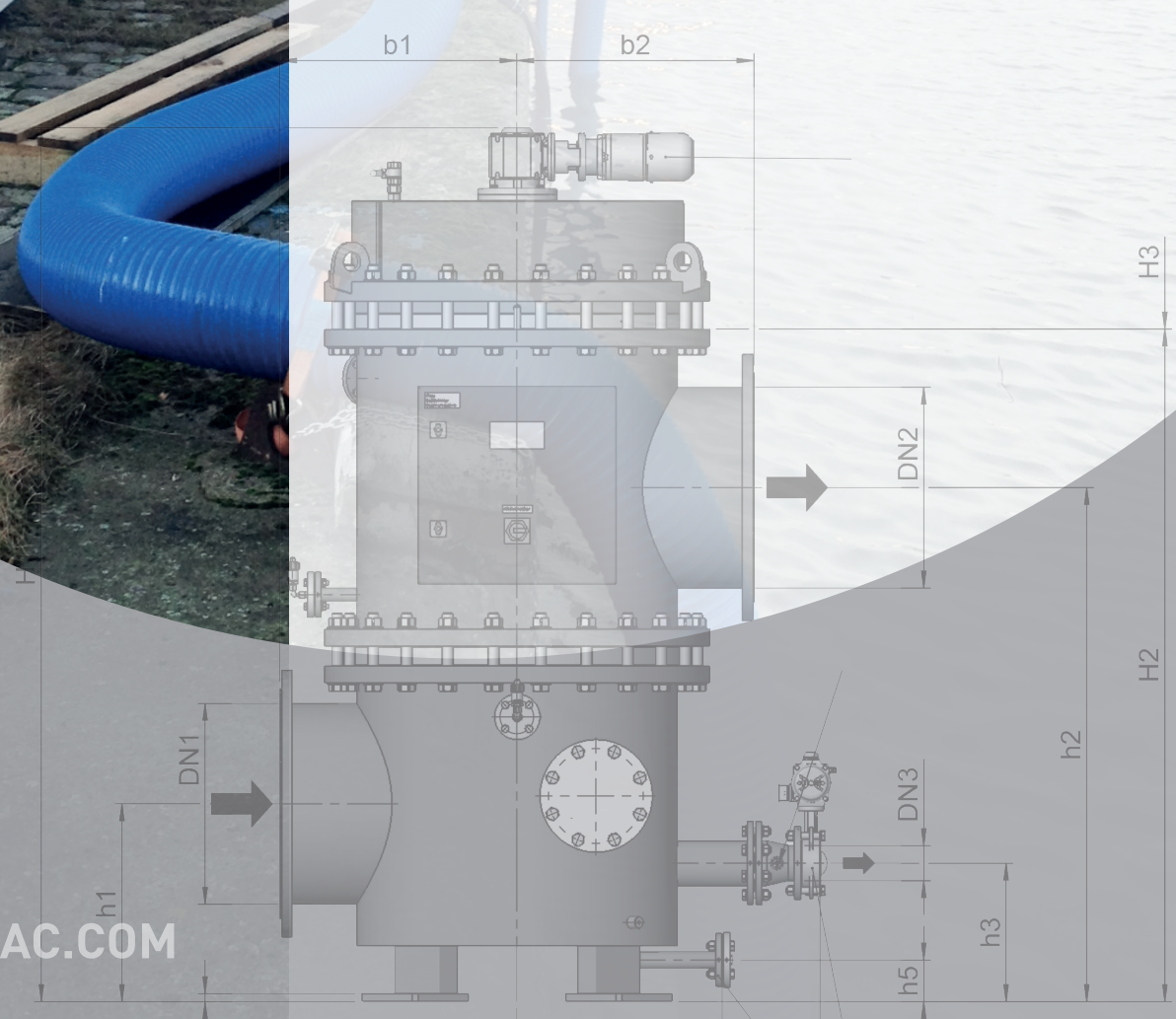
HYDAC

INTERNATIONAL

PROCESS FILTER TEST-CUBE

**Showroom for
Marine Applications**

Filters, pre-tests, product training and
service.



HYDAC worldwide



With over 8000 employees worldwide, HYDAC is one of the leading suppliers of fluid technology, hydraulic and electronic equipment. More than 50 overseas subsidiaries and over 500 sales and service partners guarantee competent on-site service – wherever you need our support.

Your specialist in ballast water pre-filtration

Across the globe, HYDAC has gained a reputation as being one of the world's leading producers of ballast water filters. With its own production sites in Europe, China, Korea and India and a global distributor and service network, HYDAC is especially well equipped for the increasing demand in the Asian markets. The product range includes filters for all types of ship – in particular ships with large ballast water capacities such as VLCCs and tankers. Whether it is for a newly built ship or a retrofit, we can offer the right filter solution for any application.

The site



The test site is located on the premises of Kraeft GmbH Systemtechnik in Bremerhaven, part of the HYDAC company group and a sector and service expert in marine equipment, hydraulic steel structures, system engineering and much more. With its favourable location at the Weser estuary, the site provides ideal test conditions with low tide influence.

Range of services

- Filter test bench
- Filter pre-tests for customers
- Customised system optimisation
- Product training
- Service training

Process Filter Test-Cube

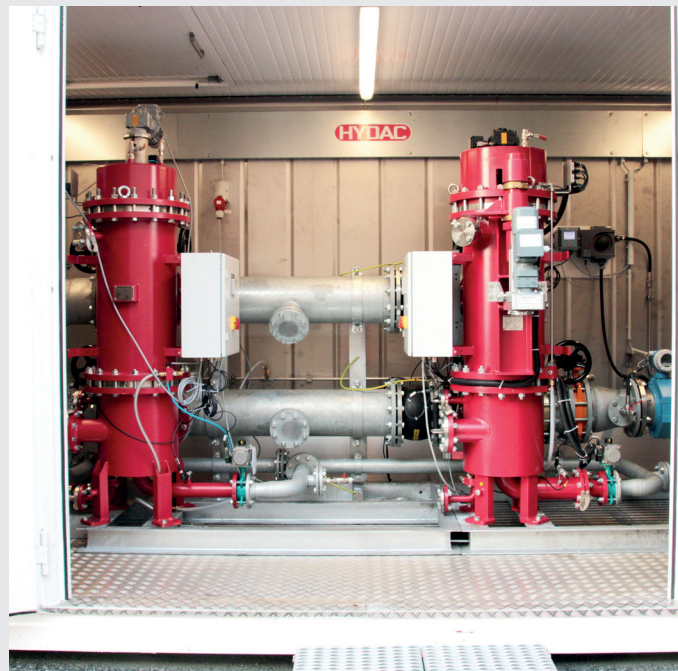


Process Filter Test-Cube

- Insulated 40" High Cube
- Process area with integrated frequency-controlled pump
- Separate electric operating area

Filter test stations

- 2x DN 250
- 1x DN 80



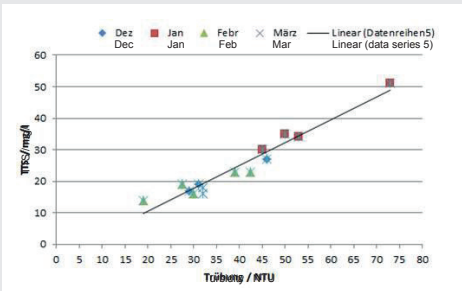


Fig. 1

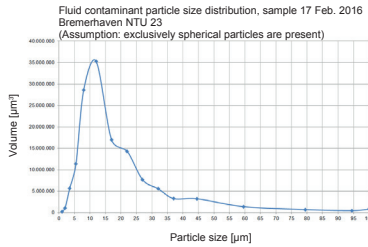


Fig. 2

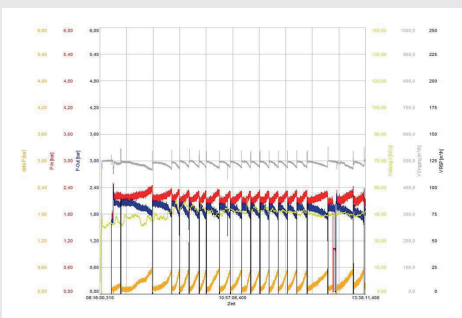


Fig. 3



Fig. 4



Fig. 5

Know-how Filter test and influencing variables

Filtration

The following parameters influence the filter's filtration/retention efficiency:

- Hydraulic parameters
 - Flow in the inlet of the back-flush line
 - Pressure conditions in the inlet and outlet of the back-flush line
- Particle count, particle size and composition
- Biological activity (dependant on the seasons)
- Shipping traffic
- Filtration rating

Turbidity/particles

The water quality is permanently displayed and recorded on the basis of a turbidity measurement (Fig. 1). The online parameter NTU (nephelometric turbidity unit) correlates to solid matter analyses from random samples.

Fluid contaminant particle size distribution

In addition to the solid matter concentration, the distribution of the various particle size fractions is relevant for the assessment of a filtration test (Fig. 2). The measurement is made by taking samples and online particle counting at measurement points upstream and downstream from the filter. The analysis and continuous recording of the measured values is provided by the HYDAC Condition Monitoring Unit CMU, an electronic evaluation unit for permanent online condition monitoring of machines and systems (Fig. 4).

Biology

Samples evaluated by an external provider as required (Fig. 5).

Data analysis

In a similar way to an electrocardiogram (ECG), all the back-flushing filter's electrical activities during operation are recorded (Fig. 3). Analysing this data makes it possible to draw conclusions regarding the particular test conditions. For example, an abrupt increase indicates the influence of shipping operation in the close vicinity of the filter intake.

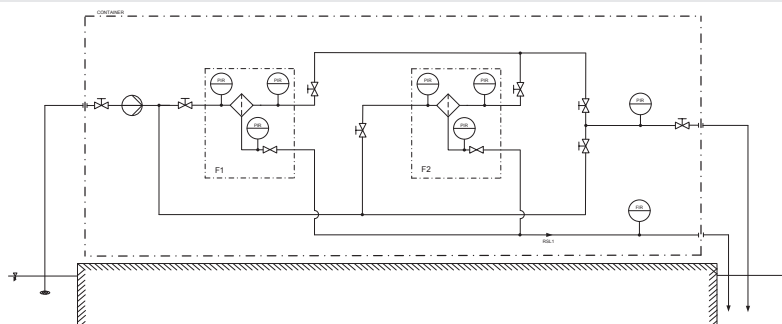
Data transfer

Convenient access and transfer of measured values and operating parameters regardless of place and time zone in the Process Filter Test-Cube.



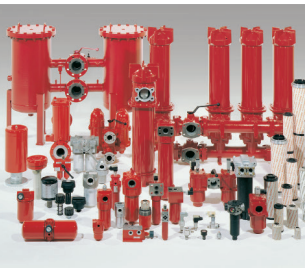
Installation

- Pipe inlets and outlets consistently in size DN 250
- Flow rate measurement (IDM) in inlet flow
- Flow rate measurement in the back-flush line
- Filter bypass operation possible
- Water level roughly 3 – 4 m below pump
- Boost pump, FC-controlled, enables simulation of installation situations
($Q_{\max} = 500 \text{ m}^3/\text{h}$, $p = 3 \text{ bar}$, $P = 55 \text{ kW}$)





Accumulators 30.000



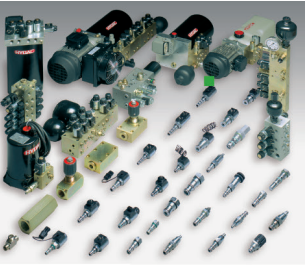
Filter Technology 70.000



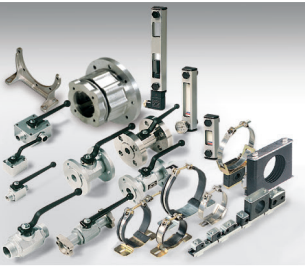
Process Technology 77.000



Filter Systems 79.000



Compact Hydraulics 53.000



Accessories 61.000

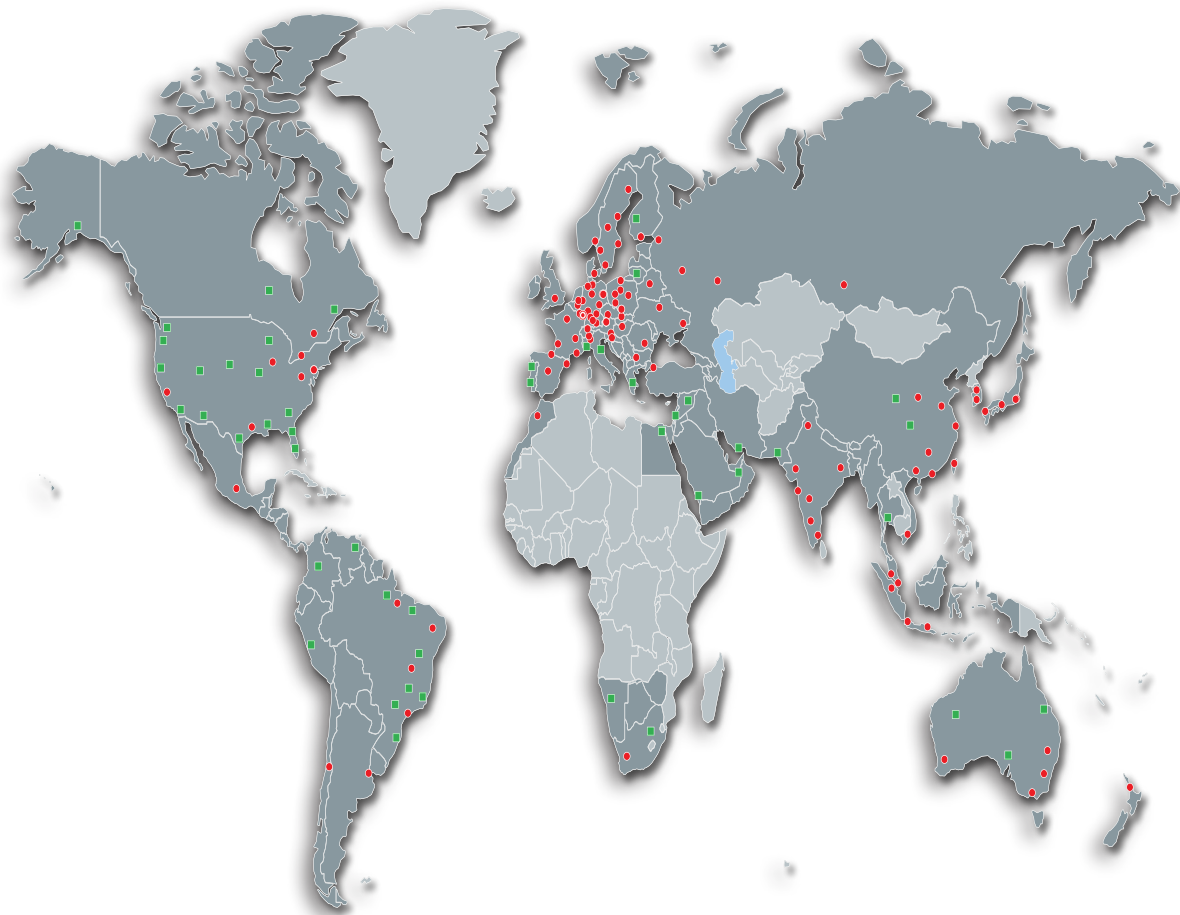





Electronics 180.000



Cooling Systems 57.000

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