



HAMANN AG

Exhaust gas cleaning with Sinter Metal-filterelements Siliciumcarbide- and Corderite monolith's obsolete

The shipbuilding and shipping industry as well as manufacturer of diesel engines and exhaust gas cleaning plants had to face the continuously strengthening of maritime air emission requirements in the last few years. And this tendency keeps on going further...

Hamann AG as a well known manufacturer of exhaust gas cleaning plants met the challenge and implemented the **SooFi-series** exhaust gas cleaning unit in the market. The new SooFi-series as the successor of the previous ceramic monolith's V 60 and V 18 series is a co-operation product from Hamann AG with it's partner, Messrs. Greentop GmbH, the german market leader in the field of sinter metal filter for land based applications.

For the first time Hamann AG had the newly developed Hamann-system Greentop® design exhaust gas cleaning system type "SooFi" 2.1 on show on the SMM, one of the world's leading trade fairs for the shipbuilding industry and attracted much of interest amongst the visitors; beside the shiny finish even due to it's new filter material.

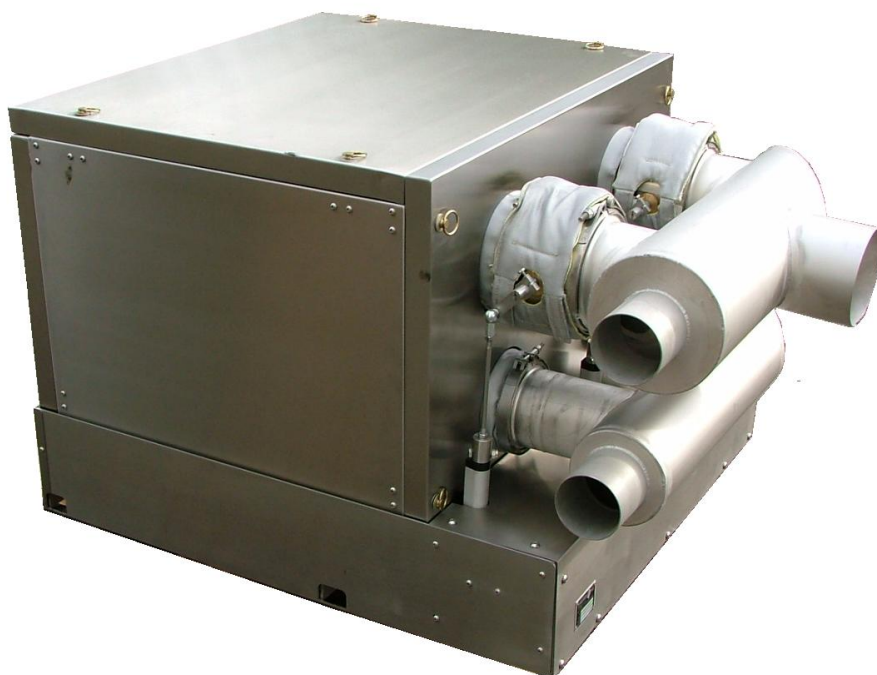


fig.1: Hamann exhaust gas cleaning unit SooFi 2.1



The filter medium was changed from silicon carbide resp. corderite wall-flow filter filter to sinter metal of the stainless quality 1.4548, which offers several advantages compared to the previous filter material.

Although the filter capacity with 95-99 % is quite the same as siliciumcarbide has got, the sinter-metal filter element outreaches the competition of ceramic filter monolith's even in terms of less pressure loss in the filter. The sinter metal has a much higher porosity and thus resulting in a very smoothly rising of the backpressure, achieving about 3-4 times longer maintenance intervals, higher ash storage capability and easier cleaning procedure; just to mention a few benefits.

cycle point 22, n=2000rpm, M=135Nm

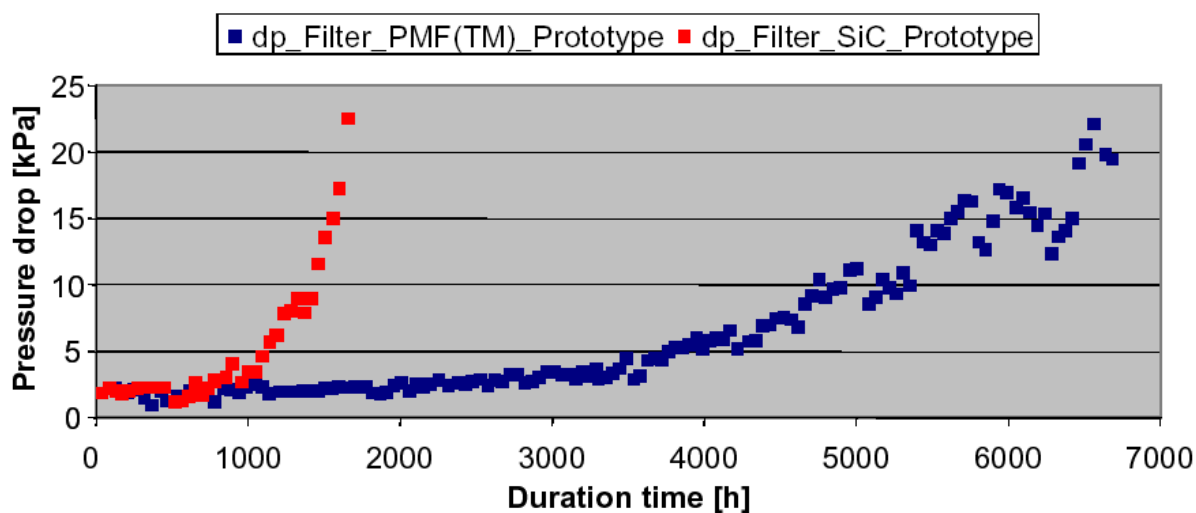


fig.2: Comparison ceramic to sinter metal; pressure drop over duration time (maintenance, i.e. cleaning interval)

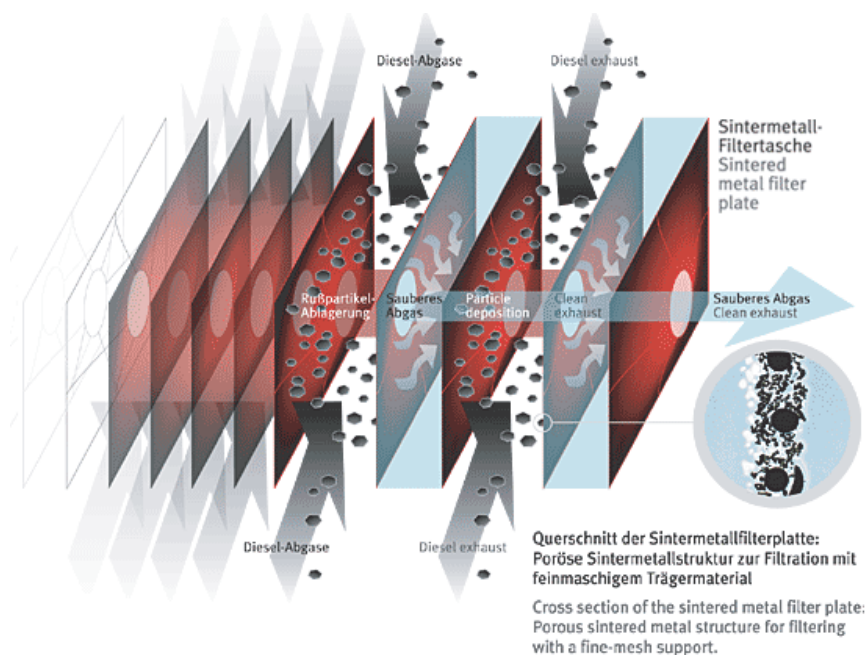


fig.3: exhaust gas passage through the sinter metal plates

Due to the additives in the lub oil as well as high sulphur and other content in marine fuels filter elements clog up more or less fast. Ceramic wall flow elements clog up faster than sinter metal and require shorter maintenance (manual cleaning) intervals. As the residuals can not be completely removed from out of the tiny wall flow channels remaining particles stay in the filter element and increase it's inner pressure value successively. After a number of cleaning procedures the ceramic element is worn out and need replacement. (see fig. 4 clogged ceramic element)

Though the maintenance intervals are 3-4 time longer sinter metal elements are not free of this incident and ash and other contents, which are being restrained in the filter element clock it up additionally and manual cleaning is necessary from time to time as well. Compared to siliciumcarbide monolith's the manual cleaning procedure is much easier to be performed and leaves the environment more unsoiled than the cleaning of a ceramic monolith usually does.

The accordion-shaped sinter metal plates are simply to be taken out of the filter housing and the ash and remaining solids in the space between the plates than cleaned by high pressure water spraying. All particles are than being flushed out and the water retains the stuff; no harmful and cancer causing particles are being led into the atmosphere and can be inhaled.

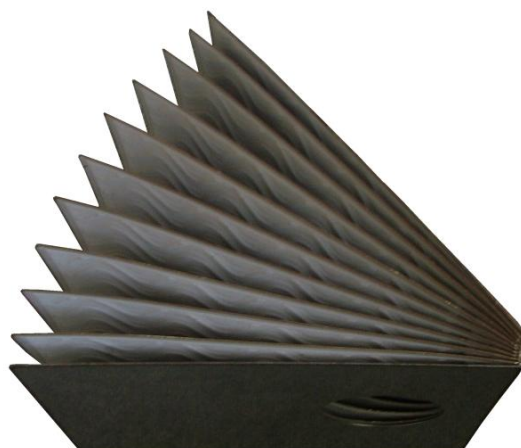


Fig. 4: Clogged ceramic monolith and sinter metal filter package folded apart

When the previous ceramic monolith's systems of Hamann were electrically charged for the regeneration procedure the philosophy has been changed to a progressive and more energy efficient cleaning strategy. Energy efficient regeneration is being performed by the newly developed high efficient fuel burner type „Tempbooster®“ which has an output from about 8 kW to 27 kW. The „Tempbooster®“ has an excellent efficiency factor, best start and burning behavior and will be assembled in all new SooFi-series units.

The SooFi series plants will all be heated up to the self ignition temperature of carbon by the diesel fuel burner, charged with pressed air and kept, until the soot is being oxidized. The regeneration of an individual filter element takes just a short period of time and thus saving energy and resources.

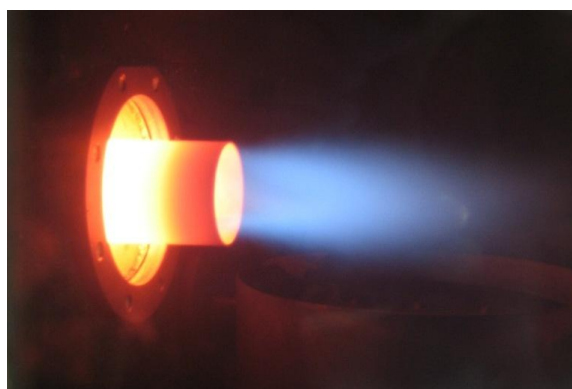
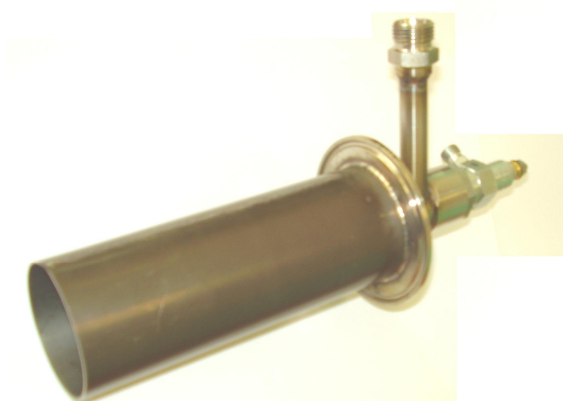


Fig. 5: Fuel burner „Tempbooster®“ and in action burning with blue flame



The new Hamann SooFi series is a modular system and can be assembled with as many filter elements as necessary to cover a range of up to about 2000 - 2500 kW or even more, depending on the maximum allowed backpressure of the appropriate engine.

The system is designed for generator application and is however also be suitable for propulsion engines. There are different system configurations available such as the SooFi 2.1, SooFi 3.1, SooFi 4.1, SooFi 2.2, SooFi 3.2, SooFi 4.2, SooFi 5.2 and SooFi 6.2 system, which are all electronically (PLC) controlled, completely manufactured in stainless steel according to ISO 9001 and from now on all be developed, designed and made in Hamann´s head office and workshop facilities in Hollenstedt/Germany.

For further information please contact Torsten Schnaugst at Hamann AG under tschnaugst@hamannag.com or visit the website www.hamannag.com