



MANN+HUMMEL  
Industrial Air  
Macrogen GT Duo

# Macrogen GT Duo

## Particle Filtration, Water Coalescer, One Stage



CLEAN  
AIR



POWER  
GENERATION



CLEAN ROOM



INDUSTRIAL

**Macrogen GT Duo has been specifically designed to meet the exact needs of gas turbine operators. With a low initial pressure drop and high dust holding capacity, combined with an inherent water repellency (coalescing and drainage), Macrogen GT Duo meets all the needs of GT power plants.**

Made from a durable plastic frame the Macrogen GT Duo product range offers excellent protection to valuable rotating machinery assets like turbines and compressors. Fitted as a pre-filter, Macrogen GT Duo can improve the overall performance of a turbine, whilst taking up minimal space by eliminating the requirement for an extra coalescer stage.

The filter is ideal for tropical, coastal and offshore gas turbine installations and atmospheric dust concentrations up to  $250 \mu\text{g}/\text{m}^3$ . Add to this a high burst strength and it is easy to see why this pre-filter/coalescer combination will improve both your turbine's performance and your maintenance schedule.

### KEY FACTS

- Combines pre-filter with high efficiency coalescer in one stage: Saves time, space and cost
- Patented highly efficient water drainage system: Drains water away from the downstream air flow
- Suitable for ambient dust concentrations up to  $250 \mu\text{g}/\text{m}^3$ : Allowing use in all environments
- Available in two depths/efficiencies and two frame configurations: Simplifies integration and replacement of existing systems
- High burst resistance up to 2,000 Pa: For reliability and safety in operation
- Low pressure drop: Maximises turbine power output
- Unique synthetic media with excellent hydrophobic properties: Eliminates the requirement for a separate coalescer stage
- Fully incinerable and lightweight: For easy storage, handling, installation and disposal
- Robust hollow profile plastic frame: Excellent strength and rigidity
- Stabilised pleats: Allow air flow rates up to  $5,000 \text{ m}^3/\text{h}$  without clogging



Macrogen GT Duo™



# Filter Design

## Improving Output

Macrogen GT Duo filters have been designed specifically to offer outstanding performance as pre filters to high efficiency filters in gas turbines air intake systems. With a unique synthetic media, Macrogen GT Duo not only provides an excellent dust holding capacity, but also coalesces fine water droplets, completely removing them from the air stream.

The ingenious design of the Macrogen GT Duo frame ensures that water always drains away from the turbine. The pleated filter media is stabilized by horizontal support beads and aerodynamically designed filter combs on the reverse side, whilst the filter element is metal-free, non-corroding and fully incinerable.

### TWO DEPTHS/EFFICIENCIES

To meet the diverse needs of differing ambient environments and customer systems, Macrogen GT Duo is available in two depths and corresponding efficiencies. A 100 mm deep panel offers efficiency to G4 (EN 779) and a 150 mm version provides protection to filter class M5. Macrogen GT Duo-100 is designed for the efficient separation of coarse dust emissions, with the 150 version suited to the filtration of smaller fine dust particles as well. This high fractional efficiency against particles in the submicron range

enables optimal protection of the downstream filters and turbine systems, eliminating the need for further pre-filtration. Despite its much smaller footprint, Macrogen GT Duo-150 has a filter area of 4.1 m<sup>2</sup> – the same as a bag filter with six 600 mm long pockets. This additional area means that the Macrogen GT Duo-150 provides a service life nearly double that of the 100 mm deep version – reducing installation, disposal and filter replacement costs.

### TWO DESIGNS

Macrogen GT Duo is also available in two frame configurations – a box design (N) or a flanged format (F) – to provide even greater flexibility and simplified integration with current systems. The traditional box format is installed in standard panel filter apertures, with the flanged version designed as a direct replacement for bag filters, thus requiring no renovation to existing frameworks.

### COMBINED INSTALLATION

Where space is at a premium, the flanged Macrogen GT Duo can be supplied in a reverse format to allow face-to-face installation with our industry-leading Compatex TMP and TMPC intake filters, providing maximum performance in a compact design.

| Air Filter   | 100 mm depth<br>Cost effective, compact design<br>in filter class G4 | 150 mm depth<br>Large filter area and long<br>service life in filter class M5 |
|--|--|---|
| <b>Normal/Box Frame Design:</b> Compact design suitable for installation in standard panel filter framework    | Macrogen GT Duo-100-N  | Macrogen GT Duo-150-N   |
| <b>Flanged Frame Design:</b> Suitable as a direct replacement for bag filters requiring no retrofit investment | Macrogen GT Duo-100-F  | Macrogen GT Duo-150-F   |
| <b>Reversed Frame Design:</b> Used in combination with Compatex TMP/TMPC for minimal space requirement         | Macrogen GT Duo-100-F-R  | Macrogen GT Duo-150-F-R   |



### REMOVING A STAGE. REMOVING THE COST.

One of the quickest ways of reducing the pressure drop of an air intake system, and so lowering cost and improving output, is to remove a filtration stage. Whilst this may appear straightforward initially, each filtration stage is designed to serve a purpose and certainly not included superfluously. Macrogen GT Duo changes this by combining the coalescing and pre-filtration stages into one. With a redundant coalescer stage removed, the pressure drop of the system will be dramatically reduced, maximising output and minimising cost. Usually, a reduction in pressure drop of 50 Pa will increase efficiency of the entire GT by around 0.1 %. Furthermore, with fewer filters to buy, install, remove and dispose, significant reductions can be achieved to the cost of operating the entire system.

# Water Coalescing Macrogen GT Duo under Testing

Where rotating equipment is located in proximity to the sea or where fog or rain is a regular part of the weather pattern, a separate coalescer stage is normal. Macrogen GT Duo has been designed to avoid the need for this through a progressively-structured filter media possessing excellent hydrophobic water repellency characteristics.

In tests, Macrogen GT Duo repelled 30 litres of water over a 1 hour period with no water breakthrough. This level of water resistance means that the option of operating rotating equipment without a classic coalescer stage becomes a reality.



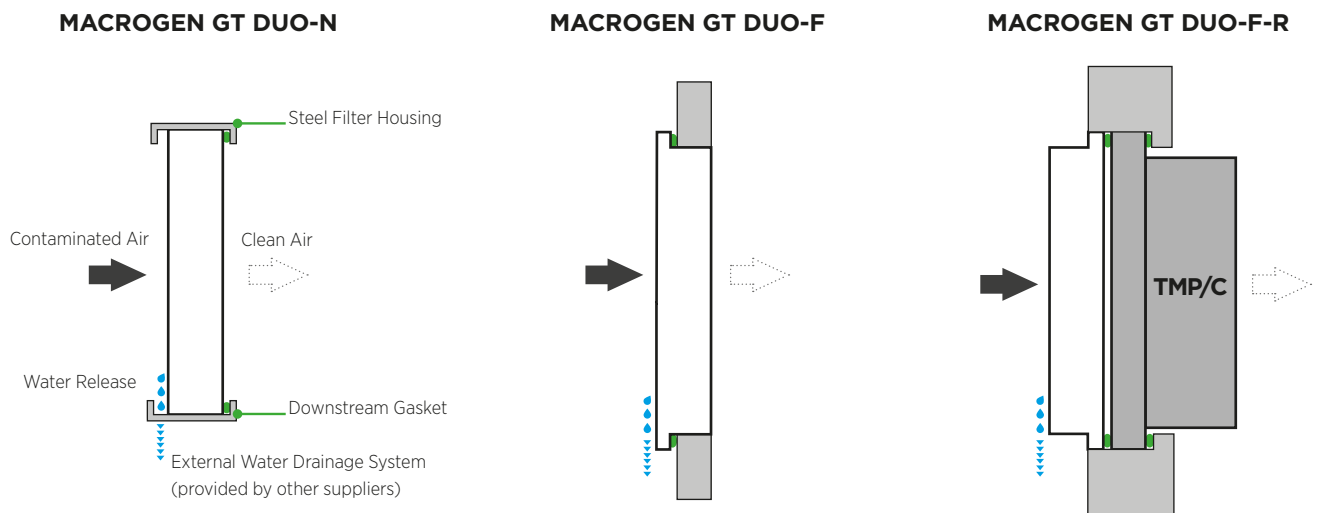
**1** Macrogen GT Duo under testing in a water test rig.

**2** The reservoir of water that collects at the bottom of the filter is removed thanks to an innovative frame design which features one side shallower than the other, forcing the water to drain towards the front of the filter, away from the final filter and turbine itself.

**3** The unique hydrophobic media design makes the filter ideal for foggy, coastal and even off-shore applications.

# Standard Installation

MacroGen GT Duo can be installed in a standard filter housing as well as into a duct housing or other installations. Water is coalesced on the upstream side of the filter media where droplets form and then fall to the base of the filter. Here, water is collected and then released via the lower part of the frame, before being drained away by an external drainage system.

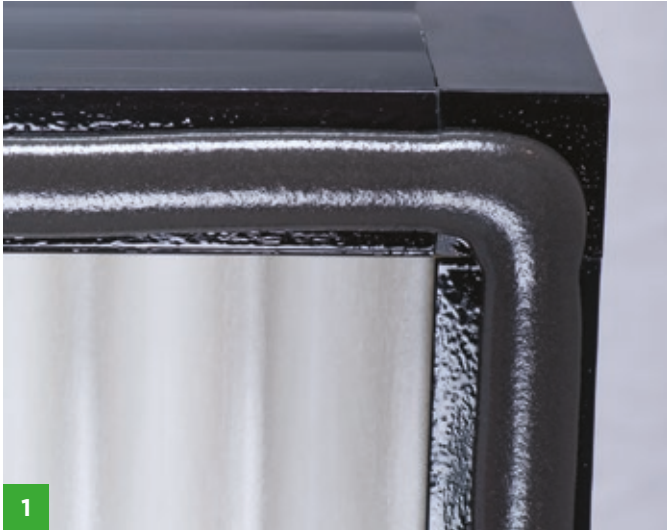


## DISPOSAL

MacroGen GT Duo filters can be disposed of in the same way as normal industrial refuse. MacroGen GT Duo is fully incinerable and contains no metal parts.



# Close-ups



- 1 PU-foamed gasket on downstream side
- 2 Optional: Tesamol gasket (19x 10 mm)
- 3 Specially-designed comb ensures pleats remain open even at the highest air flows
- 4 Aerodynamically designed filter comb

# Technical Data

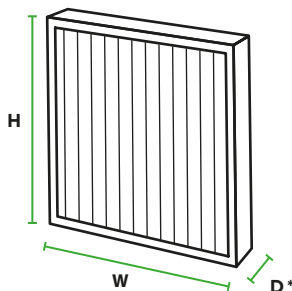
| Technical Data <sup>1)</sup>   | MGT-100-N  | MGT-100-F  | MGT-150-N  | MGT-150-F  |
|--|--|--|--|--|
| <b>Filter class</b> (according to EN 779)                            | G4   | G4   | M5   | M5   |
| <b>Average Arrestance</b>  | > 90%  | > 90%  | > 96%  | > 96%  |
| <b>Effective Filter Area</b>   | 2 m <sup>2</sup>   | 1.8 m <sup>2</sup>   | 4.1 m <sup>2</sup>                                     | 3.6 m <sup>2</sup>                                     |
| <b>Continuous Operating Temperature</b>                              | < 70 °C  | < 70 °C  | < 70 °C  | < 70 °C  |
| <b>Initial Pressure Drop</b> @ 3,400 m <sup>3</sup> /h <sup>3)</sup> | 58 Pa  | 68 Pa  | 51 Pa  | 61 Pa  |
| <b>Initial Pressure Drop</b> @ 4,250 m <sup>3</sup> /h <sup>3)</sup> | 83 Pa  | 93 Pa  | 75 Pa  | 90 Pa  |
| <b>Recommended Final Pressure Drop</b>                               | 450 Pa   | 450 Pa   | 450 Pa   | 450 Pa   |
| <b>Burst Pressure</b> (new filter)                                   | 2,000 Pa   | 2,000 Pa   | 2,000 Pa   | 2,000 Pa   |
| <b>Admissible Relative Humidity</b>                                  | > 100 %  | > 100 %  | > 100 %  | > 100 %  |
| <b>Dust Holding Capacity</b> (SAE Fine)                              | 1,200 g @ 450 Pa   | 1,150 g @ 450 Pa   | 2,010 g @ 450 Pa                                       | 1,800 g @ 450 Pa                                       |
| <b>Dimensions</b> (W x H x D)  | 592 x 592 x 96 mm<br>610 x 610 x 96 mm<br>592 x 305 x 96 mm <sup>2)</sup><br>610 x 305 x 96 mm <sup>2)</sup> | 592 x 592 x 96 mm<br>610 x 610 x 96 mm<br>592 x 305 x 96 mm <sup>2)</sup><br>610 x 305 x 96 mm <sup>2)</sup> | 592 x 592 x 150 mm<br>592 x 305 x 150 mm <sup>2)</sup> | 592 x 592 x 150 mm<br>592 x 305 x 150 mm <sup>2)</sup> |

1) 610 x 610 x 96 mm and 592 x 592 x 150 mm 2) Optional 3) Tolerance ± 10%

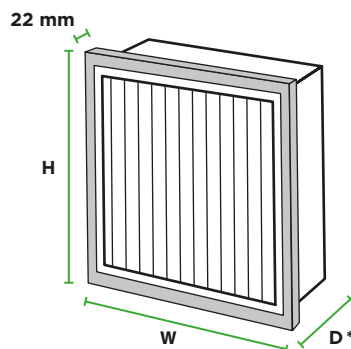
| Material Specification                 |  |
|--|--|
| Filter media                           | Synthetic media, progressively structured with hydrophobic characteristics |
| Frame                                  | ABS plastic  |
| Sealant                                | Polyurethane   |
| Gasket (standard)                      | PU-foamed on down-stream side **   |
| Pleat separator                        | Horizontal hot-melt support beads  |
| Frame stabilizer                       | ABS plastic comb   |
| Flammability Class (acc. to DIN 53438) | F1   |

\*\* Gasket Options: none, various materials, on up-stream side

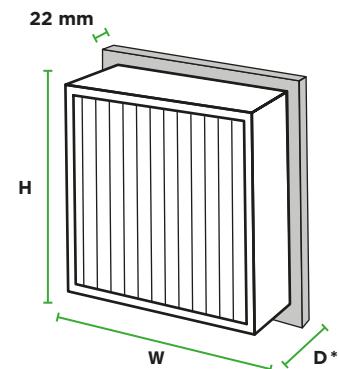
## MACROGEN GT DUO-N



## MACROGEN GT DUO-F



## MACROGEN GT DUO-F-R



\* Add 5 mm for compressed gasket. Mounting on both sides possible.



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