

Compatex TMP/C

The Outstanding Choice for Combustion Air Intakes



CLEAN
AIR



POWER
GENERATION



CLEAN
ROOM



INDUSTRIAL

Combining industry-leading pressure drop with the highest available dust holding capacity and unrivalled burst resistance, Compatex TMP/C provides unbeatable performance for gas turbine applications.

Designed specifically to remove harmful particulate from engine intake air, Compatex TMP/C provides complete defence against fouling, erosion and corrosion – maximising turbine performance and minimising downtime.

Available in a variety of filtration efficiencies and media capacities, Compatex TMP/C can be tailored to suit the exact environmental conditions and application requirements.

The TMPC version features excellent water tightness and a self-draining system, making it ideally suited for off-shore and coastal regions. Its design is well-proven in applications worldwide and provides assured reliability in operation, even in the wettest of environments.



Compatex TMPC

KEY FACTS

- Comprehensive, fully tested range: For assured performance
- Available with three different filter surface areas up to 30 m²: For normal, extended or extra-long filter life
- Fully-sealed and weather resistant TMPC version: Ideal for offshore and coastal application
- Low pressure drop: Maximises turbine power output
- Fits all commonly used filter frames: For ease of installation
- Robust hollow profile plastic frame: Provides industry-leading burst resistance
- Fully incinerable with recyclable materials: For simple, environmentally friendly disposal
- High-density, micro-glass fibre media: Provides high efficiencies at low pressure drops
- Foamed one-piece PU-gasket with closed surface: Ensures optimum performance



Compatex TMP/C

Unsurpassed Performance for Gas Turbine

Whilst the primary purpose of a gas turbine filter is to remove harmful particulate from the intake air, its effect upon the overall performance of the engine is far greater than this. An air intake filter can be judged according to the three key elements detailed below. Fortunately, Compatex TMP/C provides industry-leading performance for each of these aspects.



01 **PRESSURE DROP**

By reducing the resistance to the air flow entering the turbine, a filter with a lower pressure drop improves engine efficiency. Because of this, specifying such filters is probably the simplest and most cost effective way of boosting engine performance. It is generally agreed that reducing intake pressure drop by 50 Pa causes an increase in electrical power output of around 0.1%. Thanks to its unique design and media construction, Compatex TMP/C provides unrivalled pressure drop performance without compromising filtration efficiency. So, installing Compatex TMP/C will improve overall turbine efficiency with no retrofit and minimal downtime.

02 **BURST RESISTANCE**

An air intake filter retains all kinds of particulate harmful to the delicate inner components of a gas turbine. So, it is no surprise that a burst filter can cause untold damage to an engine as such particulate, along with any remnants of the filter, are released into the air flow. Combining an extremely strong media and rigid frame, Compatex TMP/C offers burst resistance in excess of 5000 Pa—an unmatched level of safety that eliminates concerns of filter failure and associated damage, disruption and downtime.

03 **SERVICE LIFE**

A filter's service life essentially comes down to how much particulate it can hold before compromising pressure drop to an unacceptable level. Filters with a lower dust holding capacity quickly become clogged, choking the air flow entering the turbine and impairing performance. Of course, filters with a shorter life must be changed more frequently too, increasing filter spend, maintenance costs and disruption. Compatex TMP/C features an unparalleled dust holding capacity thanks to its unique design. Firstly, up to 30 m² of media is packed into each element, providing a massive filter surface area to retain particulate. Furthermore, the V-formation of the filter mats allows even distribution of particulate across the filter, eradicating localised dust build-up within the filter.

Compatex TMP/C Construction



1

Foamed, one-piece PU gasket with closed surface ensures secure installation.



2

Frame is either mechanically locked together (TMP) or welded (TMPC). Further rigidity comes from visible and internal stiffening sections.



3

Fully-potted TMPC version for effective water drainage.



4

Unique hollow profiles provide rigidity whilst saving weight.



5

Moulded handles (top and bottom) allow easier transportation and removal of the filter from the transit carton.



6

Micro-glass fibre paper is mini pleated and formed into robust mats.



7

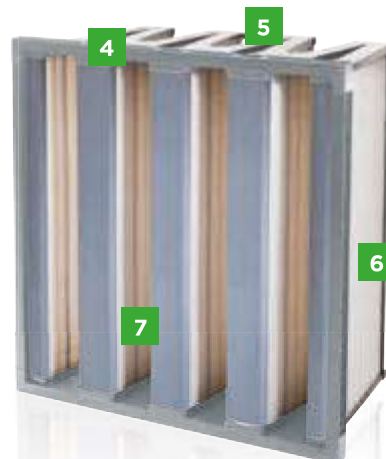
Face area affords the maximum open space for air entry, resulting in an extremely low pressure.



1

2

3



4

5

6

7

Compatex TMP/C Filter Surface Area

Whilst filters may share common external dimensions, Compatex TMP/C packs much more into its frame.

Thanks to the latest developments in high-density glass fibre media and an innovative pleating technique, the latest generation of Compatex TMP/C filters boast up to 30 m² of filter media within its modest frame dimensions—around 50% more than its predecessor. This means that Compatex TMP/C can capture a vast amount of particulate before needing to be replaced—cutting filter spend, maintenance costs and downtime.

Conversely, not all applications or customers will require such a long service life from their intake filters. It is for this reason that for all filtration efficiencies, Compatex TMP/C is available with three filter areas to suit all levels of atmospheric particulate and budget size. No matter what the individual requirements, there will be a suitable Compatex TMP/C configuration to match.



Type	Filter Area	Application
N	20 m ²	Suitable for 'normal' applications where budget is the primary concern
E24	24 m ²	Extended surface for areas with raised levels of atmospheric particulate
E30	30 m ²	Demanding applications requiring the lowest pressure drop and longest life



ENGINE DAMAGE FROM PARTICULATE

Damage caused by ingesting particulate typically falls into one of three categories:

EROSION

Caused by particles greater than 10 µm in diameter, erosion affects both the edge and thickness of the blades, compromising performance.

CORROSION

Salts and moisture entering the turbine cause an electrolytic reaction which damages the blade structure and scales metal alloys.

FOULING

A thin layer of soot and dirt deposited on the compressor blades altering their profile, fouling inhibits compression rates and shaft power output.

Compatex TMP/C E30 has a filter surface 480 times the area of this page.

Compatex TMP/C

Balancing a Multi-Stage Filter System

The overall cost of operating a multi-stage filter system relies upon the interaction between the filters within each stage. Changing the efficiency of the prefilter, for example, can have a dramatic impact upon the overall system performance and operating costs.

A prefilter arrestance which is either too low or too high can increase the overall cost significantly, and the higher the efficiency of the final stage, the narrower this optimum performance window becomes (Fig. 2).

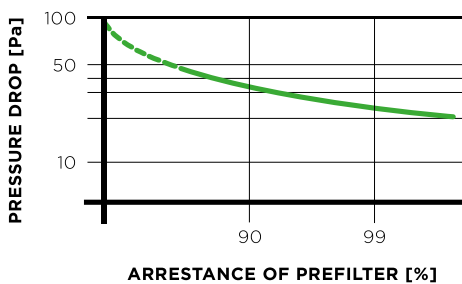
Based on this and extensive practical experience, MANN+HUMMEL specialists can assist in finding the correct balance, ensuring that the selected pre and final filter combination performs to an optimum level. With a solution tailored to the local environmental and operating conditions, the filter system will provide high efficiency, optimum filter life and the lowest possible pressure drop.

HOW WE REDUCE YOUR COST

The initial pressure drop of Compatex TMP/C filter combinations is extremely low. These low pressure drops provide significantly higher engine power output. In addition, extremely high dust holding capacities ensure low maintenance and replacement cost.

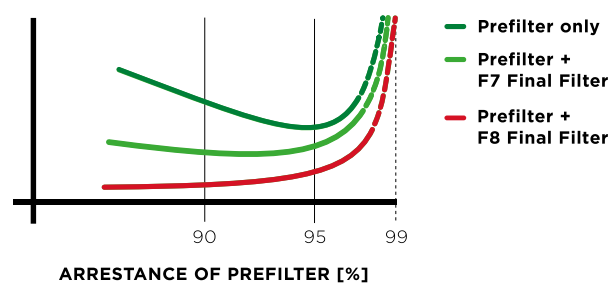
MANN+HUMMEL filters are designed for a nominal air flow of 4,250 m³/h (2,500 cfm), and when compared with the traditional 3,400 m³/h (2,000 cfm) units, they offer a 20 % space saving for a comparable life expectancy. When traditional units with an air flow of 3,400 m³/h are exchanged, the MANN+HUMMEL filter combination typically provides double the life.

Fig. 1 Dust Holding Capacity of Final Filter [%]



Tests confirm that dust holding capacity of the final filter is reduced with increasing arrestance of the prefilter.

Fig. 2 Overall Filtration Cost



Compatex TMP/C Compatibility with Other Stages

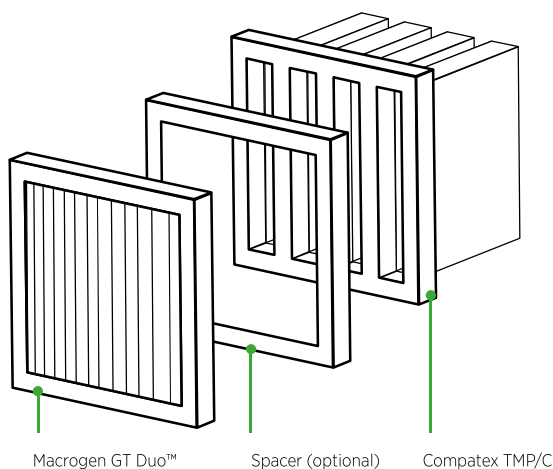
Compatex TMP/C is part of a wider system that protects a gas turbine from external contaminant, so its ease of installation and integration with other stages are crucial benefits.

In a traditional air intake configuration, coalescer panels are employed in the first stage to stop water (in the form of fog or mist) from entering the system. These panels retain moisture well, but quickly become clogged at higher air flows and as they become dirty, choking the air flow and raising differential pressure.

Now though, Macrogen GT Duo™ provides prefiltration and water removal in one filter element, allowing the removal of a dedicated coalescer stage, along with its associated pressure drop.

Accommodating a new filter configuration can require capital investment in new frames and involve significant downtime to alter the mechanical structure of the filter house. To avoid this, Macrogen GT Duo™ and Compatex TMP/C have been designed to be integrated together using simple fastening strips. This ensures straightforward deployment with no modification to the intake structure.

Cut differential pressure and boost turbine performance with no retrofit or capital investment.



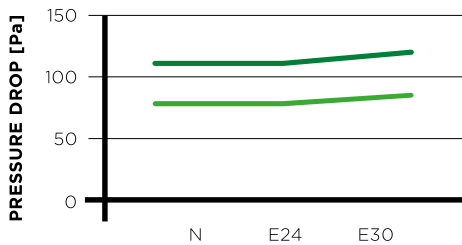
Macrogen GT Duo™

Compatex TMP/C

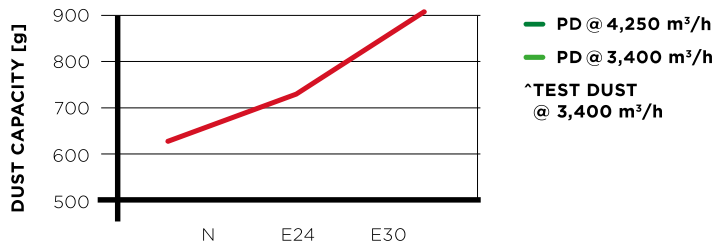
Technical Data

F7	Unit	N	E24	E30
Air Flow Rate V_N (Nominal Service Life)	m ³ /h	4,250	4,250	4,250
Initial Pressure Drop at V_N *	Pa	113	115	118
Air Flow Rate V_L (Long Service Life)	m ³ /h	3,400	3,400	3,400
Initial Pressure Drop at V_L *	Pa	80	80	82
Filter Class as per EN 779	-	F7	F7	F7
Efficiency, Atmospheric, Average**	%	80-90	80-90	80-90
Arrestance, Gravimetric, Average**	%	> 99	> 99	> 99
Filter Media Area (Installed)	m ²	20	24	30
ASHRAE Dust Holding Capacity**	g	624	724	906
Energy Rating***	-	B	B	B

F7 PRESSURE DROP

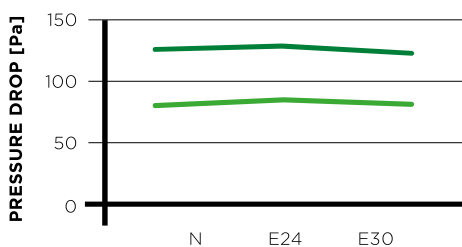


F7 DUST HOLDING CAPACITY*

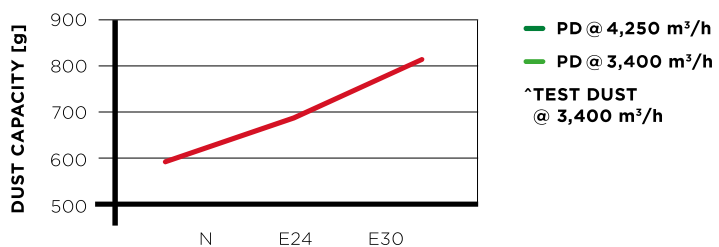


F8	Unit	N	E24	E30
Air Flow Rate V_N (Nominal Service Life)	m ³ /h	4,250	4,250	4,250
Initial Pressure Drop at V_N *	Pa	130	130	119
Air Flow Rate V_L (Long Service Life)	m ³ /h	3,400	3,400	3,400
Initial Pressure Drop at V_L *	Pa	85	85	80
Filter Class as per EN 779	-	F8	F8	F8
Efficiency, Atmospheric, Average**	%	90-95	90-95	90-95
Arrestance, Gravimetric, Average**	%	> 99	> 99	> 99
Filter Media Area (installed)	m ²	20	24	30
ASHRAE Dust Holding Capacity**	g	596	692	809
Energy Rating***	-	B	B	B

F8 PRESSURE DROP



F8 DUST HOLDING CAPACITY*

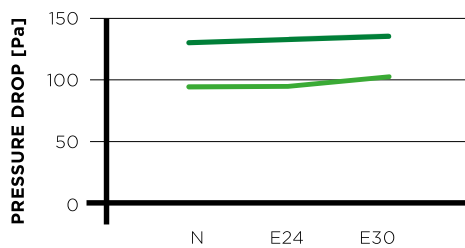


Compatex TMP/C

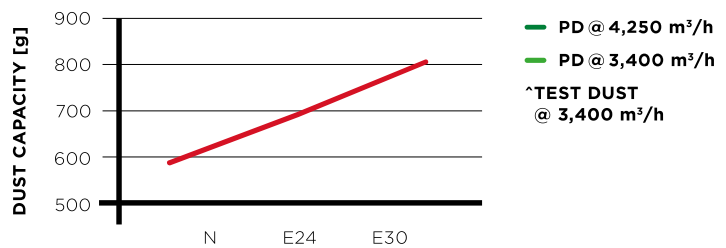
Technical Data

F9	Unit	N	E24	E30
Air Flow Rate V_N (nominal service life)	m ³ /h	4,250	4,250	4,250
Initial Pressure Drop at V_N^*	Pa	127	127	137
Air Flow Rate V_L (long service life)	m ³ /h	3,400	3,400	3,400
Initial Pressure Drop at V_L^*	Pa	94	94	102
Filter Class as per EN 779	-	F9	F9	F9
Efficiency, Atmospheric, Average**	%	>95	>95	>95
Arrestance, Gravimetric, Average**	%	100	100	100
Filter Media Area (installed)	m ²	20	24	30
ASHRAE Dust Holding Capacity**	g	593	696	803
Energy Rating***	-	A+	A	A

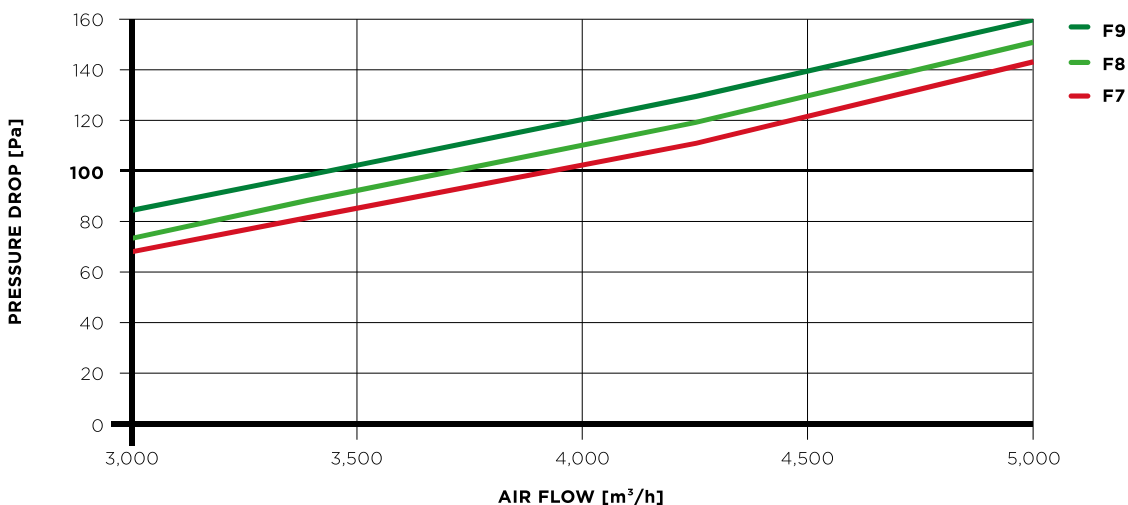
F9 PRESSURE DROP



F9 DUST HOLDING CAPACITY^



PRESSURE DROP VS AIR FLOW



All values for Compatex TMP/C type 610

* Tolerance $\pm 10\%$

** Tested according to EN 779, for 3,400 m³/h (2,000 cfm) up to 450 Pa final pressure drop

*** Energy rated according to Eurovent 4/21 guidelines

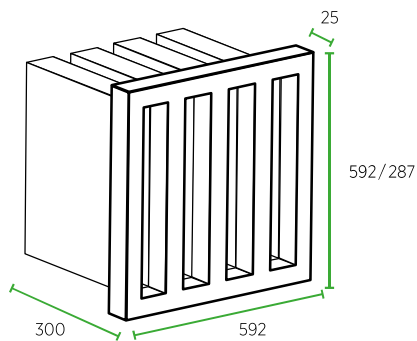
Compatex TMP/C

Technical Data

Application Parameters	
Recommended Final Pressure Drop	450 Pa
Maximum Final Pressure Drop	800 Pa
Static Burst Pressure (new filter)	3,500 Pa (TMP) / 7,500 Pa (TMPC)
Dynamic Burst Pressure (new filter)	3,500 Pa (TMP) / 7,500 Pa (TMPC)
Maximum Air Flow Rate	5,000 m ³ /h
Continuous Operating Temperature	< 70°C
Admissible Relative Humidity	< 100% (TMP) / ≤ 100% (TMPC)

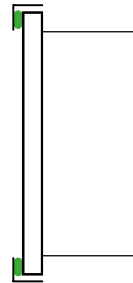
Materials Specification	
Filter Media	Micro glass-fibre bonded to paper
Filter Frame*	Incinerable, halogen-free, recycled polystyrol/ABS (TMP)
Flammability Class (standard)	DIN 53438- K2/F2
Flammability Class (upon request)	DIN 53438- K1/F1 DIN 4102-B2 UL 900, Class 2
Sealant	Two-component polyurethane
Gasket	Polyurethane – foamed in one piece with closed surface

DIMENSIONS (mm)

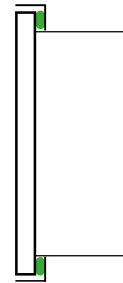


GASKET OPTIONS

Front-Face



Rear-Face



PRODUCT NOMENCLATURE

Compatex	-	TMPC	-	F7	-	610	-	E30
		Product Series TMP: cost effective, entry-level filter TMPC: fully-sealed, weather resistant model		Filter Class F7 – F9		Dimensions 305/610		Filter Area N: Normal (20 m ²) E24: Extended (24 m ²) E30: Extended (30 m ²)

* Maximum permitted torque per mounting point along the plastic frame is 1.4 Nm

Compatex TMP/C-E30 types use an improved hotmelt separator technology together with a strong backing screen attached to the media packs.