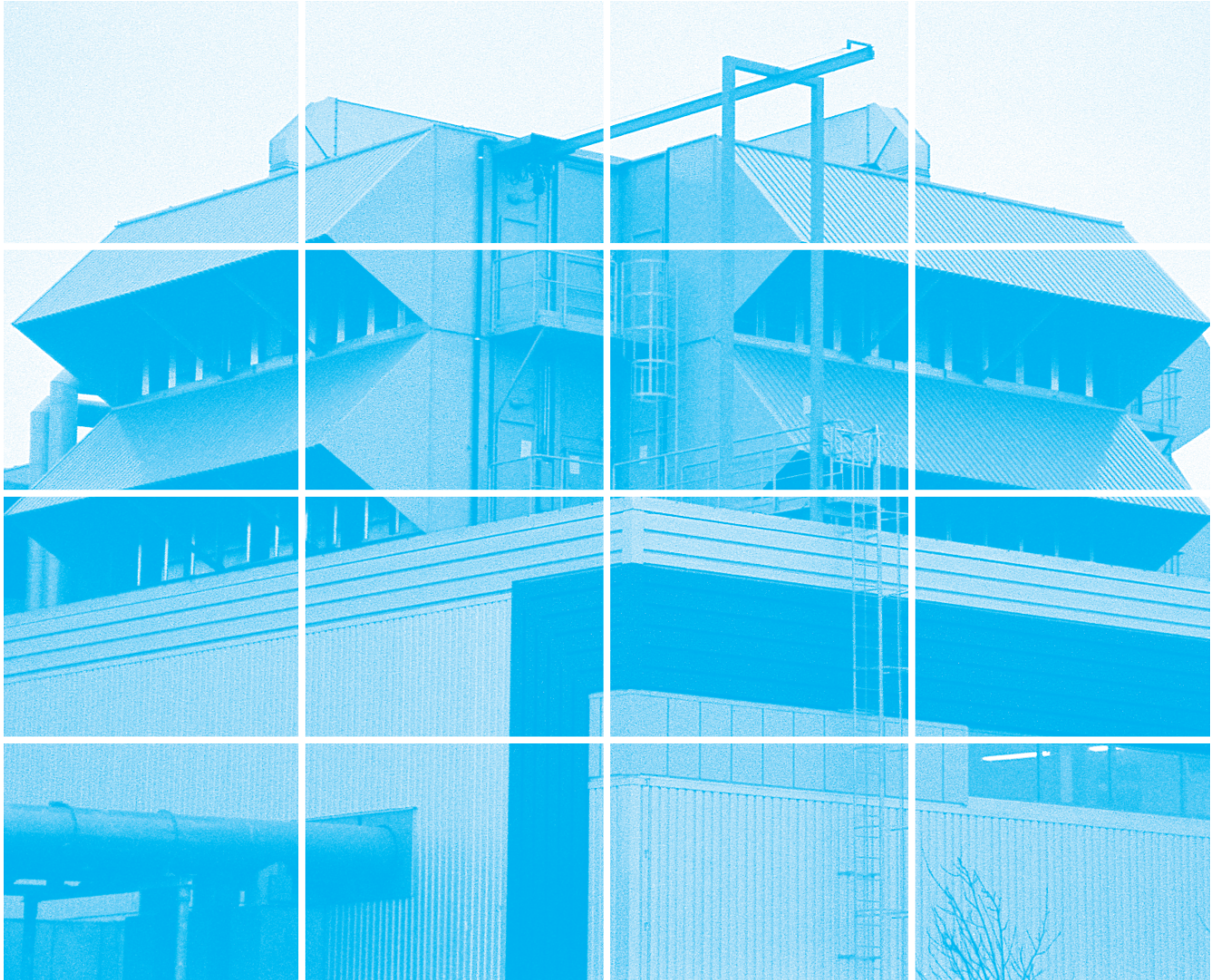


# Luwa<sup>®</sup> TMP and TMPC Filters



## The Superior Solution for Combustion Air Intake Systems

- New, fully sealed TMPC version for off-shore and coastal application
- Most comprehensive range – fully tested
- Large filter surfaces – extremely long service life
- Low pressure drop – maximum power output
- Robust hollow profile plastic frame – high burst resistance
- Glass fibre paper medium – no fibre loss, no shedding
- Fully incinerable, recyclable materials
- Minimal weight and installation depth
- Fits all commonly used filter frames

**Luwa**

# Luwa Turbine Minipleat Filters – the superior solution

LuwaTMP filters remove airborne particulate matter from combustion engine intake air, providing full protection from fouling, corrosion and erosion of the turbines key components. TMP filters are most suitable for gas turbines, diesel engines, compressors and air conditioning units for power plants, offering lower pressure drop and extended life. The Luwa TMP filters are available in 7 efficiencies, two pleating densities and two designs. Used in combination with the Luwa GS synthetic pocket filter range, they offer optimised efficiency/life time relationship at the lowest pressure drop.

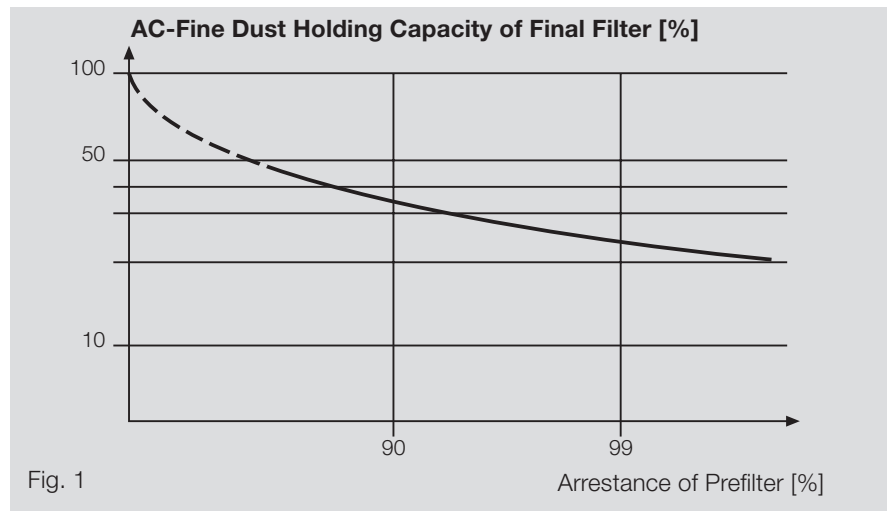
When selecting a combination of pre-filters and final filters, one should consider:

- the co-ordination of the filters efficiencies,
- the optimisation of the dust holding capacity,
- the minimisation of the overall system pressure drop.

Tests confirm that the dust holding capacity of the final filter is reduced with increasing arrestance of the prefilter (see **Fig. 1**).

## Is Cost Important to You?

The cost performance of combined filter stages depends on the interaction of the filter efficiency of the prefilter with that of the final filter and hence its effect on the overall system dust holding



capacity. For a given final filter efficiency, both a too low and a too high prefilter arrestance increase overall cost. The higher the efficiency of the final filter stage, the narrower is the resulting sector for an optimal choice of the prefilter stage (see **Fig. 2**).

Based on these facts and on extensive practical experience, Luwa specialists are happy to assist you in the selection of optimal pre and final filter combinations, tailored to your local environmental and operating conditions.

## How We Reduce Your Cost

The initial pressure drop of the Luwa TMP filter combination is extremely low.

For example:

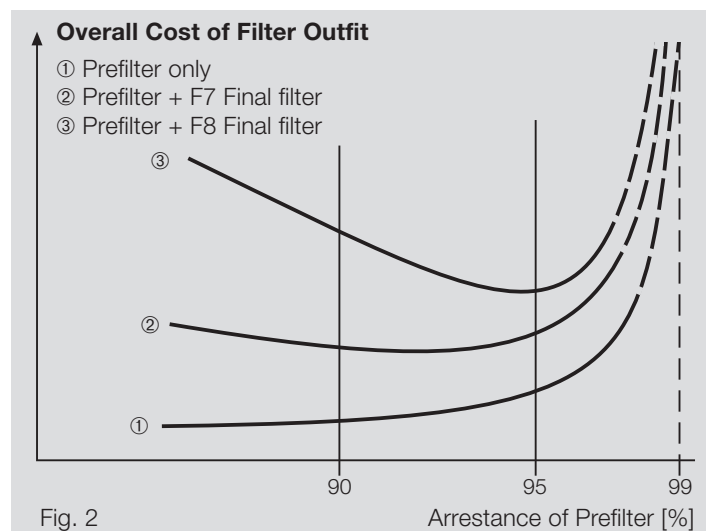
- GS-G3-K (125 mm) + TMP-F7: 120 Pa @ 3400 m<sup>3</sup>/h  
190 Pa @ 4250 m<sup>3</sup>/h
- GS-G4 (350 mm) + TMP-F8: 150 Pa @ 3400 m<sup>3</sup>/h  
215 Pa @ 4250 m<sup>3</sup>/h

These low pressure drops – a typical property of the Luwa filter systems – offer on one hand significant higher power output of the engine and thus a shorter pay back period of the investment. The high dust holding capacities on the other hand assure low maintenance and replacement cost.

Luwa GS/TMP filters are designed for a module air flow of 4250 m<sup>3</sup>/h (2500 cfm). Compared with the traditional 3400 m<sup>3</sup>/h (2000 cfm) units they offer 20% space saving for a comparable life expectancy. When traditional units with a module air flow of 3400 m<sup>3</sup>/h are exchanged, the Luwa filter combination typically doubles the life.



Gas turbine air intake housing for 515000 m<sup>3</sup>/h



Luwa TMP and TMPC fine dust filters are available in efficiency rates of 70, 86, 93, 96 and 98 % to ASHRAE 52.1-92 and in filter classes F6 to F9 to EN 779 respectively. The micro glass fibre paper is mini pleated, formed into mats and sealed into a fully welded plastic frame in a four-V arrangement. Unique hollow profiles feature an extremely rigid and light-weight filter (5.3 kg only). Maximum open face area results in lowest pressure drop and extended filter medium area in maximum dust holding capacity. A fully potted HEPA-tight version, TMPC, with conical plates for optimal water drainage is also available. Luwa TMP and TMPC fine dust filters, with the standard dimensions 592 x 592 x 300 mm, are interchangeable with commonly used filters and fit most frames.



**Luwa TMP Filter**

### Application Parameters

#### Continuous operating temperature:

- ≤ 70 °C
- High temperature version for up to 120 °C on request

#### Pressure drop (pd):

- Recommended final pd: 450 Pa
- Maximal final pd: 800 Pa
- Burst pd (new filter): >2500 Pa

#### Dimensions:

see page 4

#### Admissible relative humidity:

< 100 % for TMP  
 ≤ 100% for TMPC

Luwa Fine Dust Filter TMP and TMPC	Type	F6-610	F7-610	F8-610	F9-610	H10-610
Air flow $\dot{V}_N$ (normal service life)	m <sup>3</sup> /h	4250	4250	4250	4250	3400
Initial pressure drop at $\dot{V}_N$	Pa	95	105	125	135	140
Rated air flow $\dot{V}_R$ (long service life)	m <sup>3</sup> /h	3400	3400	3400	3400	3000
Initial pressure drop at $\dot{V}_R$	Pa	65	70	90	95	120
Filter class as per EN 779 (EN 1822)	–	F6	F7	F8	F9	(H10)
Efficiency, atmospheric, average <sup>1)</sup>	%	70	86	93	96	98
Arrestance, gravimetric, average <sup>1)</sup>	%	98	>99	>99	~100	~100
<b>Type N:</b> Filter medium area	m <sup>2</sup>	20	20	20	20	20
ASHRAE dust holding capacity <sup>1)</sup>	g	750	624	596	564	460
AC-fine dust holding capacity <sup>2)</sup>	g	1420	1300	1030	920	790
<b>Type E:</b> Filter medium area	m <sup>2</sup>	–	24	24	24	24
ASHRAE dust holding capacity <sup>1)</sup>	g	–	724	692	655	535
AC-fine dust holding capacity <sup>2)</sup>	g	–	1510	1200	1070	920

<sup>1)</sup> Tested to ASHRAE 52.1 and EN 779, for 3400 m<sup>3</sup>/h (2000 cfm) up to 450 Pa final pressure drop

<sup>2)</sup> Tested on ASHRAE 52.1 test rig, for 4250 m<sup>3</sup>/h (2500 cfm) up to 600 Pa final pressure drop

### Material Specification

#### Filter medium:

micro glass-fibre bonded to paper

#### Filter frame:

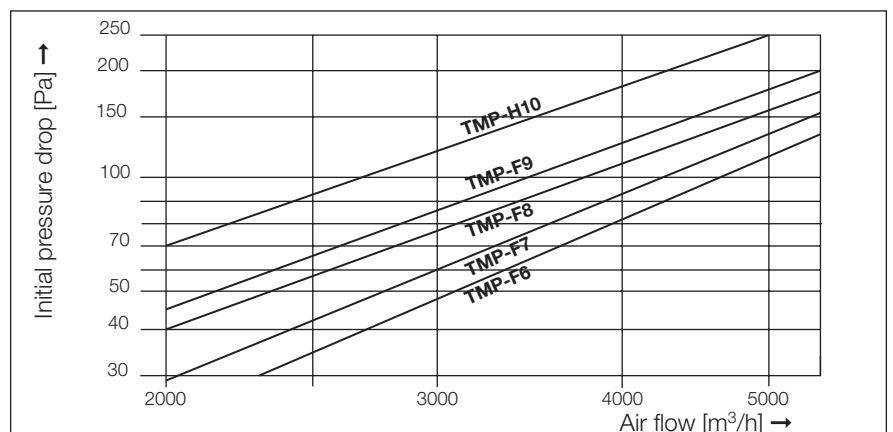
incinerable, halogen-free, recycled Polystyrol

#### Flammability classification:

DIN 53438-K2/F2 and DIN 4102-B2 Version with classification DIN 53438-K1/F1 (UL 900, Class 2) on request

#### Sealant:

Polyurethane foam



Luwa TMPC Ultrafilters are available in nominal efficiency rates of 90%, 97% and 99.9% for 0.3  $\mu\text{m}$  DOP to US Mil. Std. 282 and in filter classes H10, H11 and H12 to EN 1822 respectively. They are designed in the same way as the TMPC fine dust filters, described on page three.

Luwa TMPC Ultrafilters are designed to meet the requirements of the latest generations of ultra-efficient GT's which are very sensitive to submicron particles. The Ultrafilters are available in the fully potted HEPA-tight TMPC version only, due to the higher tightness requirements of the higher efficiencies.

For application parameters and material specifications see page 3



Luwa Ultrafilter TMPC	Type	H10-610	H11-610	H12-610
Air flow $\dot{V}_N$ (normal service life)	$\text{m}^3/\text{h}$	3400	3400	3400
Initial pressure drop at $\dot{V}_N$	Pa	140	180	295
Rated air flow $\dot{V}_R$ (long service life)	$\text{m}^3/\text{h}$	3000	3000	3000
Initial pressure drop at $\dot{V}_R$	Pa	120	155	260
Filter class as per EN 1822	–	H10	H11	H12
Initial efficiency as per EN 1822 (MPPS-DEHS test)	%	$\geq 85$	$\geq 95$	$\geq 99.5$
Initial efficiency as per US. Mil. Std. 282 (DOP test)	%	90	97	99.9
<b>Type E:</b> Filter medium area	$\text{m}^2$	24	22	22
Recommended class of prefiltration <sup>1)</sup> (EN 779)	–	F7	F8	F9

<sup>1)</sup> Depending on local environmental conditions – ask for Luwa's design assistance

