Cyclone filter / Cyclone separator / Multi-cyclone separator

As of: 07/2026



MULTI-CYCLONE SEPARATOR FOR RAIL VEHICLE VENTILATION SYSTEMS:





- Separation tests in line with ISO5011 yield an overall degree of separation of up to 97 %
- Very low maintenance costs
- Operation with and without dust extraction fan possible
- With rail approval
- Designed and produced in accordance with DIN EN 15085
- Vibration and shock test in accordance with IEC 61373:1999 category 1, class B
- With fire protection certificate in accordance with EN45545

DESCRIPTION:

High concentrations of dust in the intake air may result in frequent maintenance intervals for downstream components in rail vehicles or failures caused by dust contamination. Either contaminated textile filters require frequent replacement or downstream components need regular cleaning to ensure fault-free operation of the systems. The self-cleaning dust separator with continuous dust discharge for technical ventilation systems facilitates significantly longer maintenance intervals and improves the service life of the other components (filters, fans, actuators) in the system.

PROS AND CONS OF DIFFERENT DUST FILTERATION SYSTEMS:

	Air intake grille without filter mat	Ventilation grille with filter mat	Multycyclone
Degree of dust separation	--	++	++ (up to 97 %)
Water separation degree	++	++	+
Price	++	+	+
Maintenance expenditure	++	--	+
Pressure loss	++	+	-

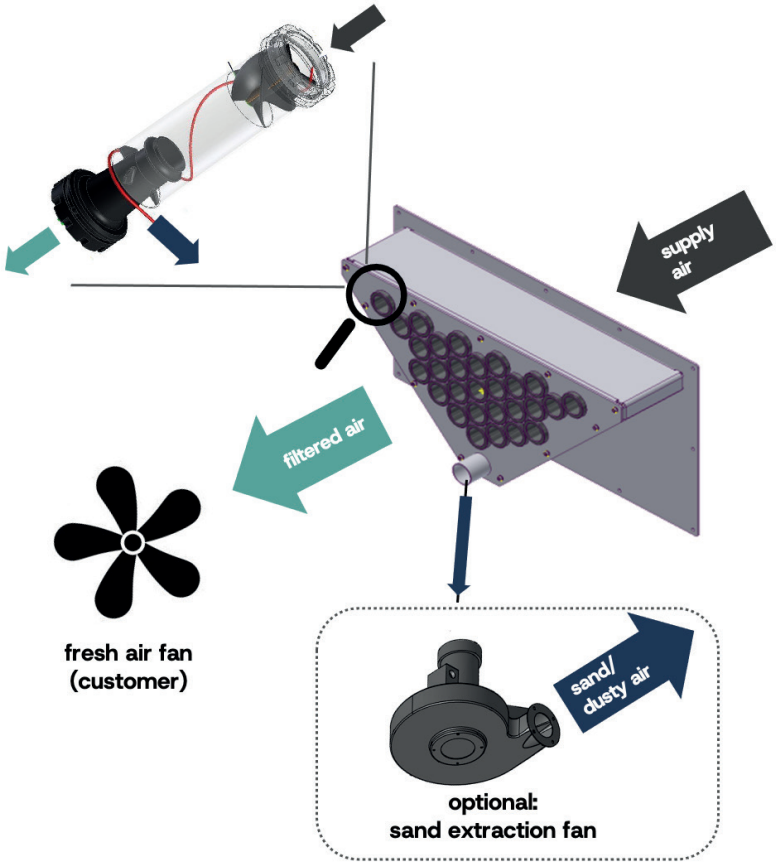
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KRAPF LEX

Standard air intake grilles feature a high level of water separation and no continuous separation of dust.
The filter mats installed downstream of ventilation grilles soon come to the end of their dust storage capacity with large volumes of air and dust.

Multicyclones as pre-separators increase the service life of filter mats by 2000 %.
Used in numerous projects in Saudi Arabia, Kazakhstan, Egypt, etc. since 2012.

FUNCTIONAL PRINCIPLE / SERVICE LIFE



FUNCTIONAL PRINCIPLE:

The air is put info rotation as it enters the cyclone. The dust is descharged to the outside due to centrifugal force and extraced by a dust discharge fan or collected in a sealed area.



Degree of separation Pre-filter	Dust quantity in the fine filter	Filter service life	
		Factor	Percent
0 %	1000 g	1	100 %
50 %	500 g	2	200 %
75 %	250 g	4	400 %
80 %	200 g	5	500 %
85 %	150 g	6,7	667 %
90 %	100 g	10	1000 %
95 %	50 g	20	2000 %

INCREASE FILTER MAT SERVICE LIFE

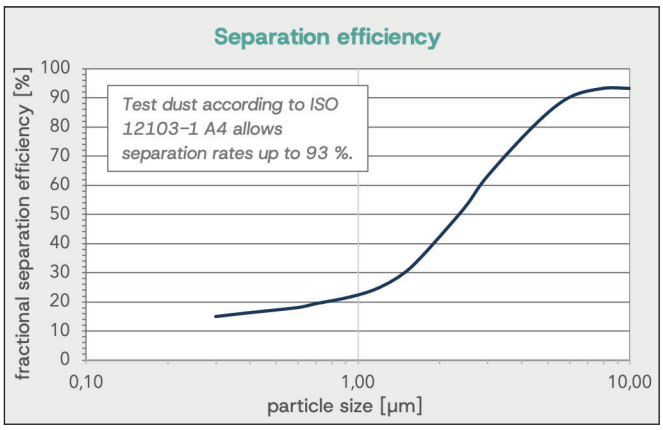
The service life of downstream fine filters increases depending on the level of separation of the multicyclone. The dust load of the fine filter drops to up to 50 g with a dust quantity of 1000 g, for example. This extends the service life by 2000 %.

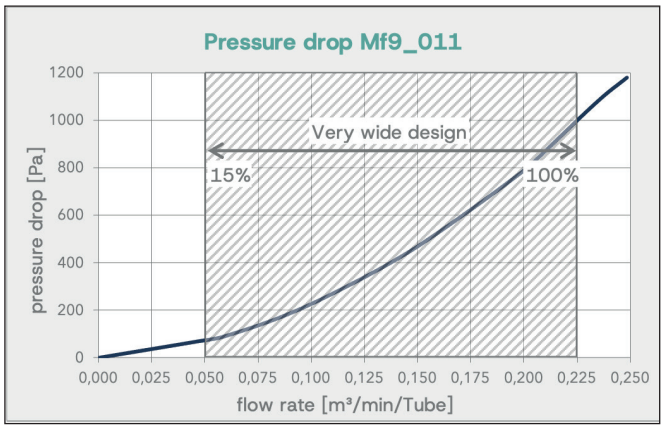
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TECHNICAL DATA:

SMALL CYCLONE

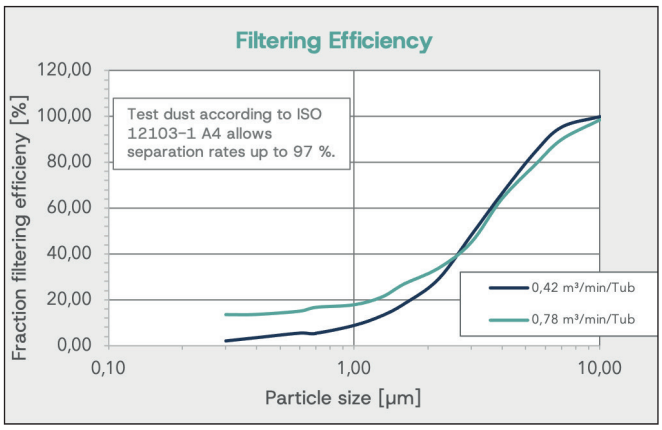


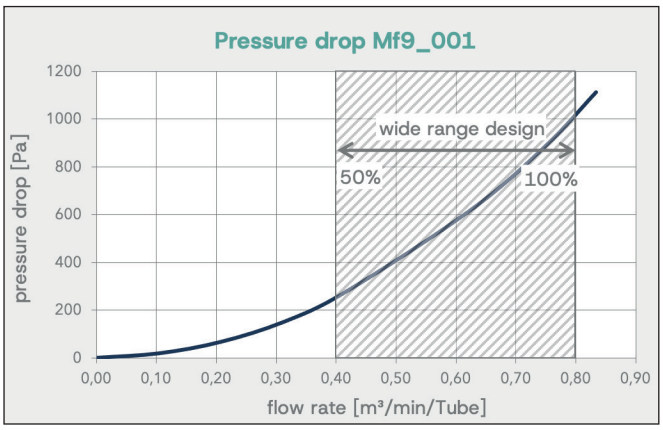




LARGE CYCLONE









TESTED IN THE DESERT:

The dust load that rail vehicles are exposed to in desert regions was simulated with trucks. The superstructure on the test truck drew in the dust-laden air from the dust plume of the truck in front at a rate of approx. 700 m³/h. Following test runs, both the quantities of dust separated by the cyclone as well as the quantities not separated were determined. These dust samples also yielded valuable information regarding the dust composition. A generator and the complete ventilation system with multi-cyclone, dust extraction fan and various fine filters were placed on the loading area of the test vehicle. The test was conducted by Krapf & Lex in the Tunisian desert.

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