
Ring-Jet particulates separator

Description

The Ring-Jet is a modular unit developed for the efficient removal of particulates (dust and aerosols) from off gas and flue gas. It is based on the venturi principle. The Ring-Jet allows the energy efficient elimination of a wide variety of different particulates at a high and reliable rate.

Since the ring jet is built into a system in modular way, the gas volume to be treated and the resulting pressure change can easily be accommodated by the addition or removal of individual Ring-Jet units. The very robust Ring-Jet is made of polypropylene. It is little sensitive to plugging and/or crusts formation. The Ring-Jet can be installed and operated in any direction needed to accommodate whatever the airflow requires.

Characteristics

- The Ring-Jet made of polypropylene resists acid and alkaline conditions
- Simple and easy installation
- Small space requirement
- Any mounting position possible according to the airflow required
- Adaption to changing volume flows and/or pressure drop requirements easily possible by the variation of the number of installed Ring-Jets
- Low scrubbing liquid pressure requirements due to optimized distributor will save substantially in pumping energy
- Different options available for the supply of scrubbing liquids
- Stabilization of the pressure drop by simple variation of the scrubbing liquid quantity in case of changing flue gas volumes
- Gaseous pollutants (e.g. SO₂, HCl etc.) will also be eliminated by effective absorption due to the intensive contact of scrubbing liquid and off gas in the venturi jet as well as in the exhaust section
- No auxiliary energy supplies like compressed air, steam or high voltage needed
- Retrofitting of existing scrubbers easily possible

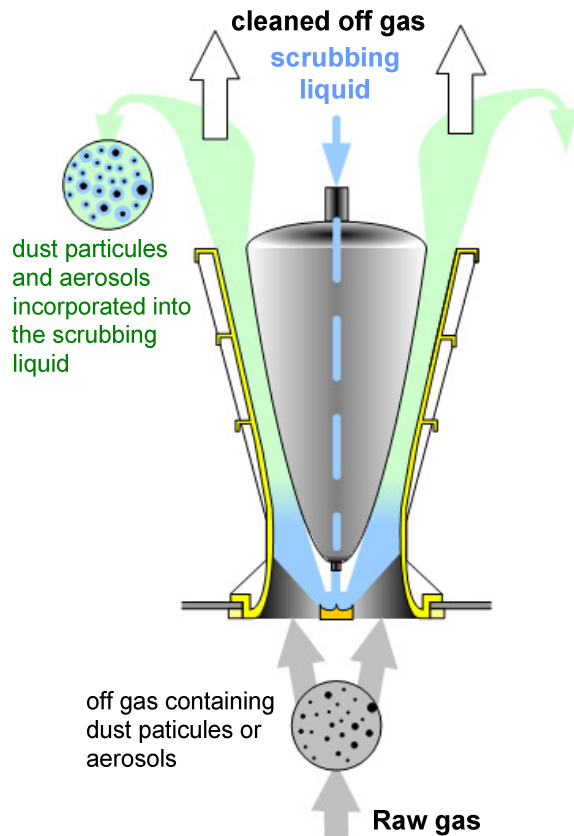


Multiple Ring-Jet modules installed in parallel in a scrubber



To achieve low emission values for particulates the flue gas treatment of the two incineration plants are equipped with Ring-Jet's

Mode of operation



The Ring-Jet particulates separator uses the well known venturi principle. The separation of the particulates in the Ring-Jet is due to the high velocity difference induced by the chosen pressure loss. Using an impact plate, the scrubbing liquid injected by the central tube will be directed into the throat of the unit, where it is evenly distributed. After colliding with dust particles and aerosols of the raw gas, scrubbing liquid and gas will exit the unit by the circular gap.

The entry of the solid particulates into the scrubbing liquid droplet is forced mainly by inertia and therefore depends mainly on the differential velocity between the particulates and the liquid droplet. To increase this velocity, the gas is accelerated in the annular throat of the Ring-Jet. At the point of the highest velocity the scrubbing liquid droplets will impact with the gas stream. Gas and liquid will exit the unit by the diffuser, where the slowdown of the velocity is used to regain pressure and the overall pressure drop is minimized.

The fine liquid droplets are carried out by the gas stream will have to be separated by a subsequent droplet separator. The highly efficient Balewa unit type TB was especially designed for this purpose.

Field of applications

- **Flue gas of incinerator plants**
(domestic and/or industrial wastes)
 - salt aerosols
 - high-molecular organic compounds
 - fine particulate matter
 - heavy metal aerosols
- **Roasting plants**
 - very fine dust
 - condensable metal compounds (e.g. Se, Re)
 - acid mist (e.g. SO₃)
- **Chemical industry**
 - toxic solids (e.g. insecticide, herbicide)
 - acid mist (e.g. HCl, SO₃)
 - aerosols (e.g. NH₄Cl)
- **Dye stuff production**
 - pigment dust particles
- **Tar industry**
 - tar
- **Aluminum foundries**
 - HF, coal dust, tar

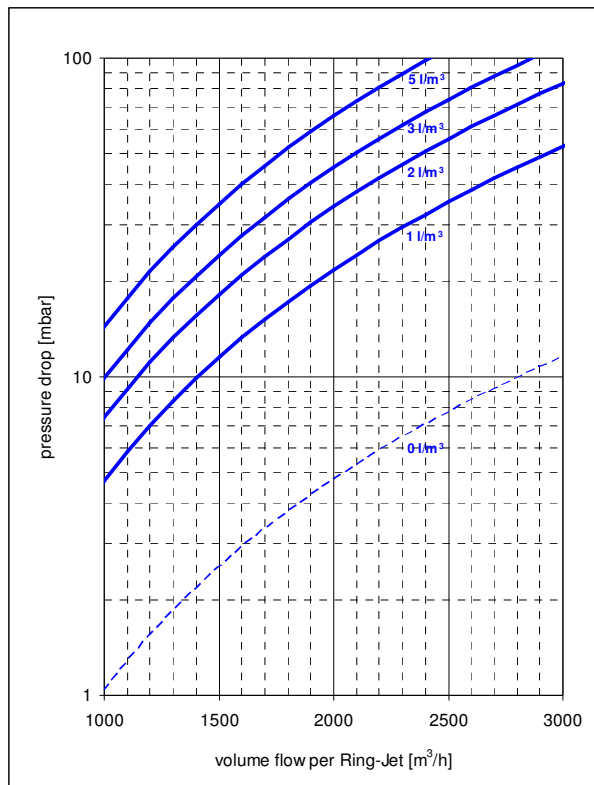
The Ring-Jet units for the efficient particulate removal from gas streams can ideally be combined with our other products such as the HEDGEHOG packing as efficient mass transfer enhancer in off gas scrubbers or the droplet separator type TB for advanced liquid spray elimination.

Technical data

Gas volume per unit	1'500 to 3'000 m ³ /h
Scrubbing liquid quantity per unit	1.5 to 9 m ³ /h
Differential pressure	15 to 120 mbar
PM concentration at inlet	10 mg/m ³ to 10 g/m ³
PM diameter	0.1 μm to >1 mm
Material of construction	Polypropylene
Maxi admissible operating temperature	80° C
Weight per unit	4.5 kg
Dimension per unit (approx.)	height 500 mm, diameter 360 mm

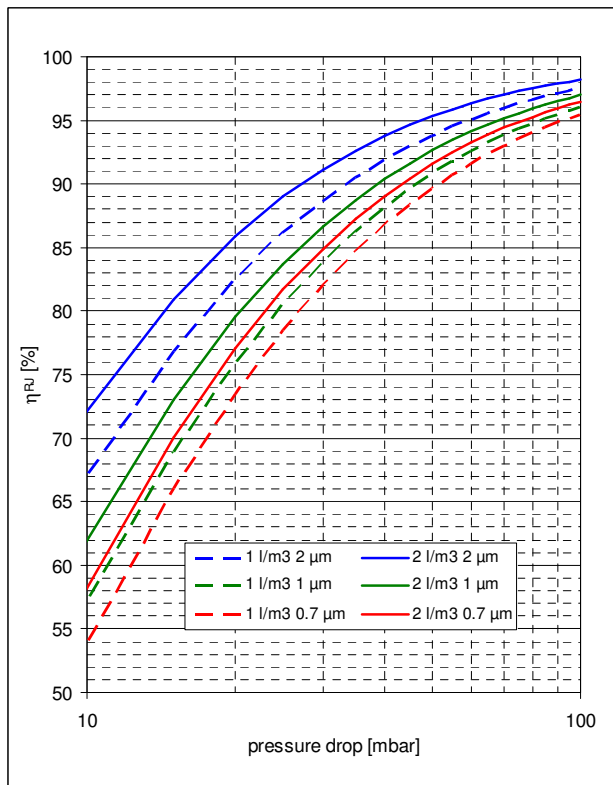
Pressure Drop

at a gas density 1.15 kg/m³



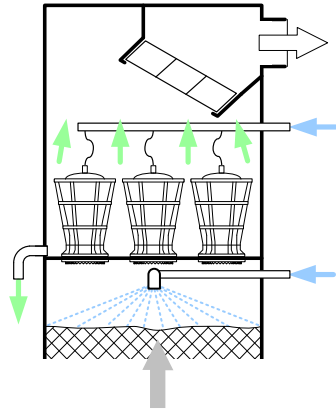
Removal efficiency

at a raw gas concentration of approx. 300 mg/m³



Mounting positions

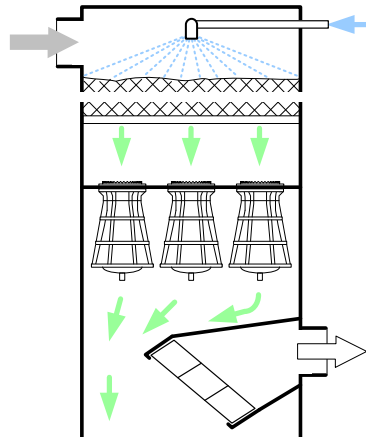
Air flow bottom-up
(counter-current scrubber)



Most popular arrangement for sleek multistage scrubbing systems consisting of packed bed scrubber, Ring-Jet stage and droplet separator

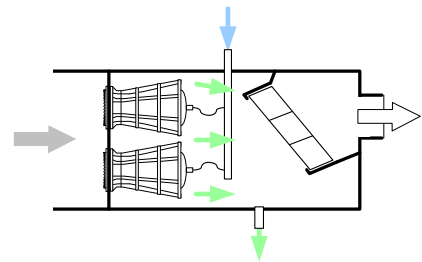
The separation efficiency of particles in the Ring-Jet unit can be increased by pre-conditioning the particulates in a wet packed bed scrubber column installed in front of the Ring-Jet stage

Air flow top-down
(co-current scrubber)



There is no need for the individual supply of scrubbing liquid to each unit if the Ring-Jets are mounted in a top-down mode. The scrubbing liquid poured on the Ring-Jet deck will overflow into each individual unit by means of the specially designed Ring-Jet crown

Air flow horizontal



Due to its high versatility, a Ring-Jet unit can easily be retrofitted as an efficient particulates separator into existing off gas installations. Often, this can be done without the need to install costly and complicated re-directions pipes

Accessories and connecting parts

For easy installation of Ring Jet units as well as for trouble-free operation and maintenance we recommend the use of the following tools and accessories distributed by Balewa AG:

- Pipe-threads and special connection hoses
- Blind-set for blocking spare mounting openings in the Ring-Jet deck
- Mounting tool

Design and sales

Design, sizing, sales

Balewa AG, Grammetstrasse 14, CH-4410 **Liestal**, Switzerland
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e-Mail info@balewa.ch

Packaging

in boxes, larger quantities on one-way-pallets