



Cooling
Scrubbing
Conveying with
jet scrubbers



Körting

THE EJECTOR COMPANY

Körting
jet scrubbers

The wet scrubbing specialists

Jet scrubbers

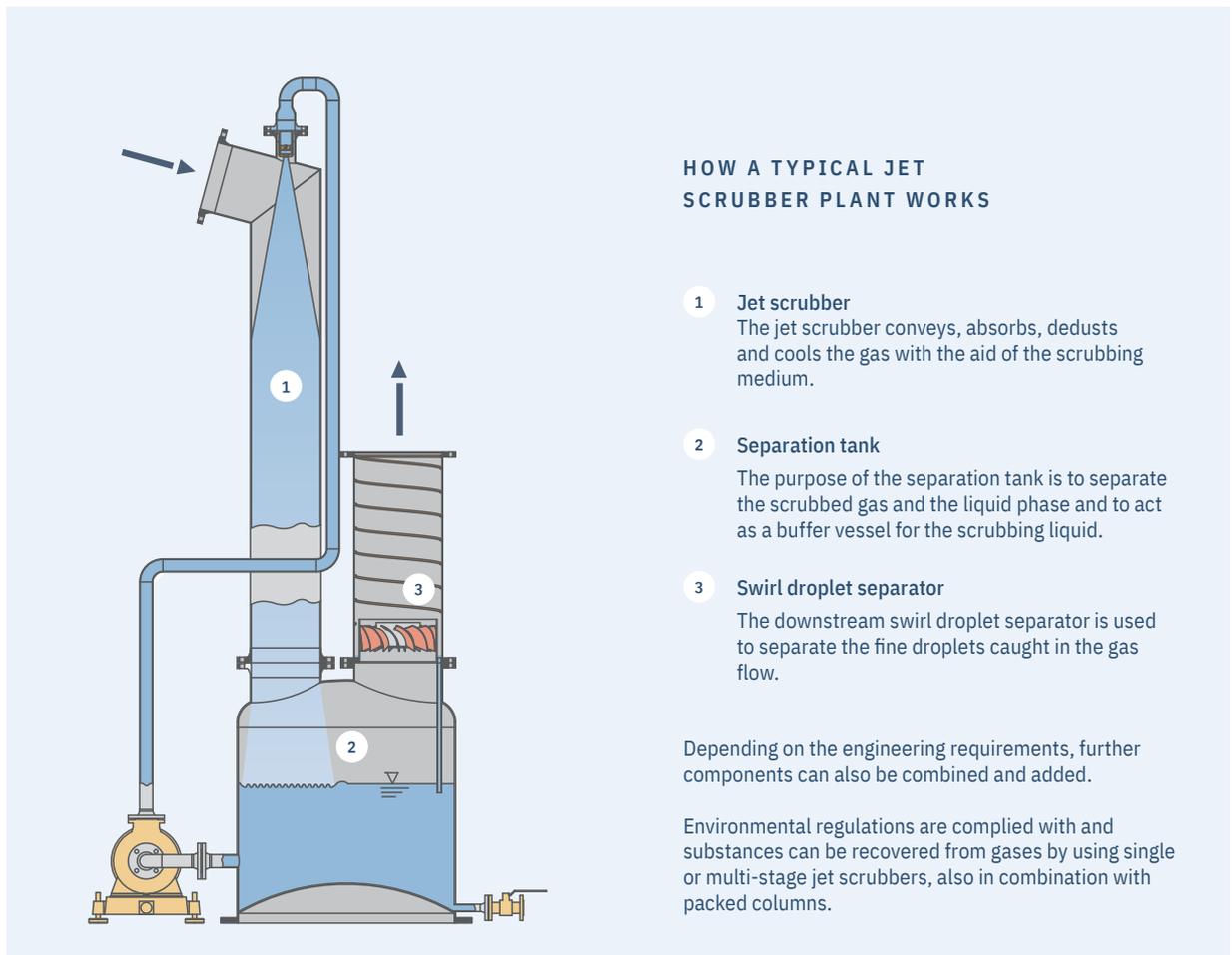
FROM PLANNING TO COMMISSIONING

Jet scrubbers are used for the following processes:

- Cooling
- Absorption
- Dedusting
- Conveying

The gas enters the jet scrubber from the side. The motive fluid acts as a scrubbing medium and is injected into the scrubber in the same direction as the gas. The gas is accelerated due to the momentum exchange with the motive fluid.

This results in conveying flow, enabling an increase in the gas pressure. Depending on the design of the scrubber, this rise in pressure means that its internal flow resistance and the resistance in adjacent pipes can be overcome. Therefore, the jet scrubber replaces a mechanical ventilator in many cases. The level of power transmission manifests itself in a jet scrubber's pressure gain. Because the scrubbing medium is sprayed through nozzles, the cylindrical section of the scrubber is filled with a full cone and reaches the large phase interface area between the gas and the liquid, which is required for the basic operations.



HOW A TYPICAL JET SCRUBBER PLANT WORKS

- 1 Jet scrubber**
The jet scrubber conveys, absorbs, dedusts and cools the gas with the aid of the scrubbing medium.
- 2 Separation tank**
The purpose of the separation tank is to separate the scrubbed gas and the liquid phase and to act as a buffer vessel for the scrubbing liquid.
- 3 Swirl droplet separator**
The downstream swirl droplet separator is used to separate the fine droplets caught in the gas flow.

Depending on the engineering requirements, further components can also be combined and added.

Environmental regulations are complied with and substances can be recovered from gases by using single or multi-stage jet scrubbers, also in combination with packed columns.

Two-stage jet scrubber
to absorb H₂S
(hydrogen sulphide)
in synthetic fibre production



BENEFITS OF THE KÖRTING JET SCRUBBER

- Simple and compact designs
- Low maintenance
- High degrees of reliability and availability
- No fire risk in the scrubber
- A combination of gas conveying with dedusting, absorption and cooling



Vent gas treating system (VGTS) for the continuous renewable reformer (CCR) process, based on the UOP process

Vent gas treating system (VGTS)

The vent gas treating system is a complete unit that consists of key components such as a jet scrubber, separation tank, packed tower and a swirl droplet separator, all mounted in a steel structure. The task of the system shown above is to remove hydrochloric acid, chlorine and sulphur dioxide from a hot process flow. The machine is designed for a

gas inlet temperature of **530°C**. When sodium hydroxide (**10% NaOH**) and sodium bisulphite (**20% NaHSO₃**) are used as the scrubbing medium, all components requiring absorption can be removed from the waste gas. As required by environmental regulations (German TA Luft regulation), the gas emissions are scrubbed and can be released into the atmosphere.

APPLICATIONS

The self-priming jet scrubber is superb for:

- **Conveying gas without mechanical ventilators**
- **Direct gas cooling (quenching)**
- **Physical and chemical absorption of pollutants (SO₂, Cl₂, HCl, NH₃, HF, H₂S, etc.)**
- **Separating dust particles over 3 µm**
- **Recovering substances from gases**

SIZES

Körting jet scrubbers are supplied as follows:

- Standard designs of DN 80 to DN 1,000 for gas flows of 60 to 26,000 m³/h, also in combination with packed columns
- Customised solutions for gas flows of 60 to 100,000 m³/h, as a single or multi-stage version

Depending on the application, combinations can be used to fulfil special conditions and requirements.

We can even offer solutions with good track records for special cases, such as gas flows of up to 300,000 m³/h or gas temperatures over 1,000°C.



ATEX-compliant jet scrubber

MATERIALS

The Körting jet scrubbers are supplied in:

- Carbon steel, stainless steel
- Steel with coatings: rubber, PVDF, PTFE, Halar, etc.
- Plastic: fibreglass, PP, PVC, PVDF – reinforced and non-reinforced
- Special materials

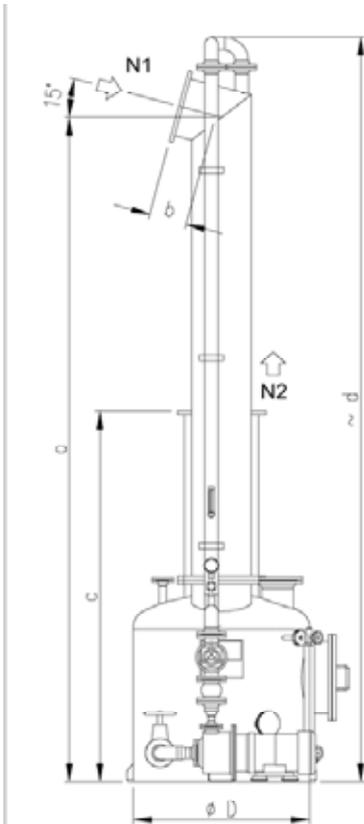
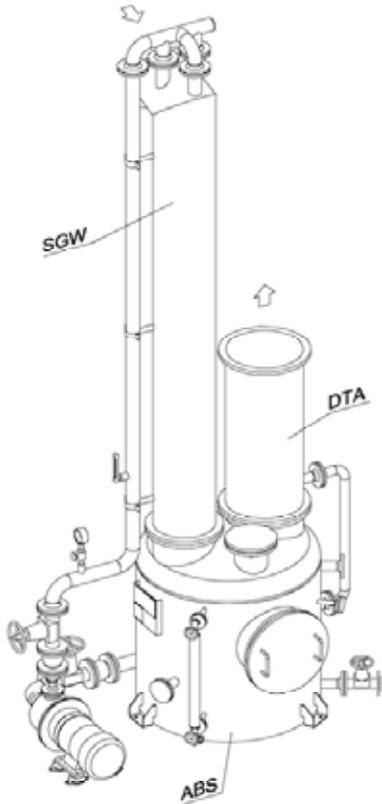


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Jet Scrubber Plant: Type I

v22.02



EXECUTION	
Material	PP
Pump	PP
Fittings	PP
Screws	A2-70
Gaskets	EPDM
FIXED FLANGES (Connecting dimension)	
Gas	EN 1092-1
Liquid	EN 1092-1
DESIGN	
allow.work.temp.	80 °C
allow.work.pres.	+/-10 mbar
Corrosion suppl.	0 mm

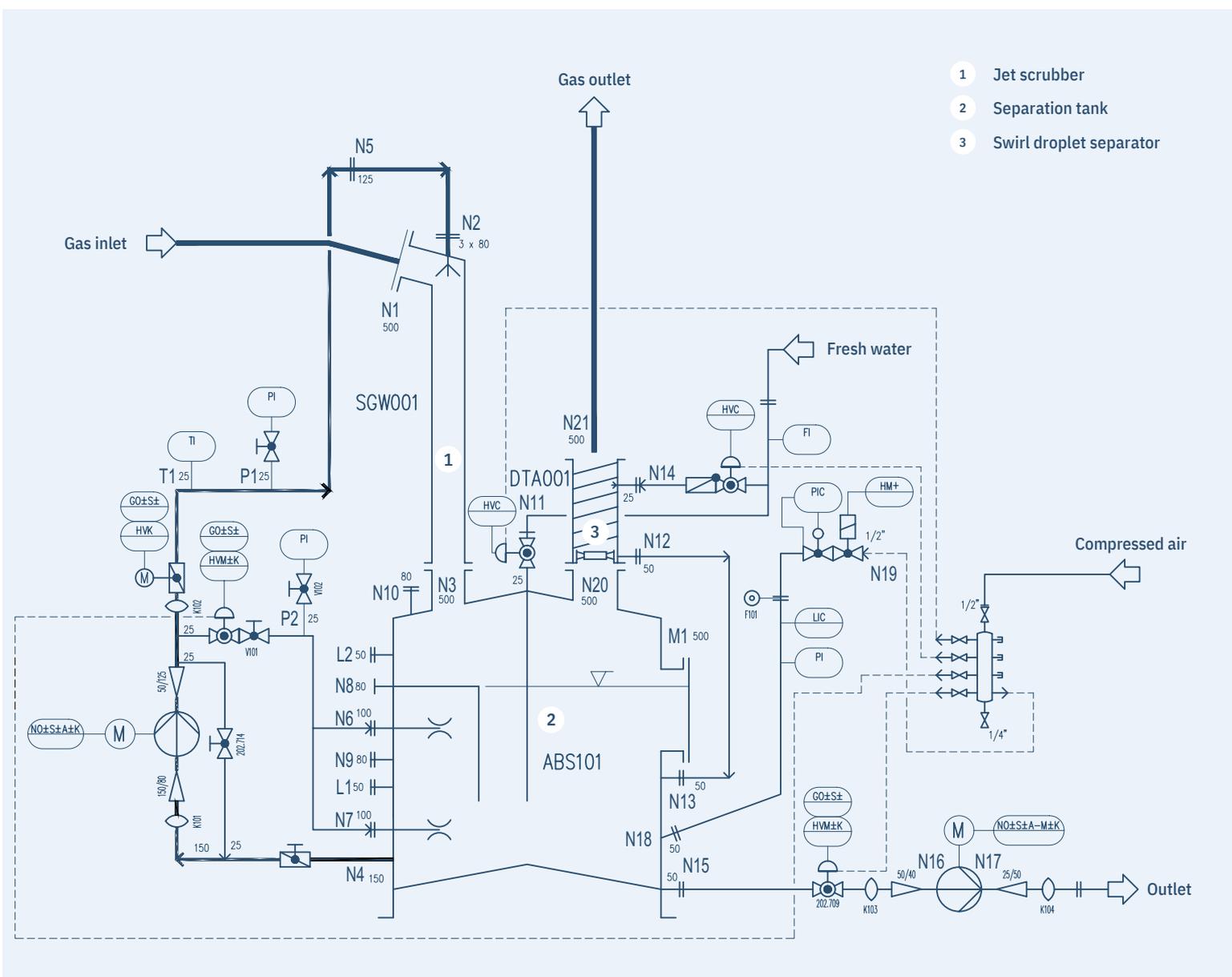
EXECUTION	
Material	1.4301
Pump	SS
Fittings	SS
Screws	A2-70
Gaskets	Klinger SIL
FLANGES (Gas up to DN 250: EN 1092-1)	
Gas	DIN 28031/'33
Liquid	EN 1092-1
DESIGN	
allow.work.temp.	150 °C
allow.work.pres.	-0,2/+0,5 bar
Corrosion suppl.	0,3 mm

SCOPE OF DELIVERY
 acc.
 Technical Specification

SIZE	FLOW			DIMENSIONS								WEIGHT	
	Gas		Liquid	Gas								Plant	
	norm	max		inlet	outlet							PP	1.4301
	[m³/h]	[m³/h]	[m³/h]	N1	N2	D	a	b	c	d	Area	[kg]	[kg]
0	60	150	1,5	80	200 (D)	700	1980	200	1300	2300			
1	100	250	2	100	250 (D)	700	2100	200	1300	2400			
2	180	400	3	125	200	700	2400	200	1650	2700			
3	250	600	4	150	250	700	2750	200	1750	3050			
4	500	1000	5	200	300	800	3200	200	1950	3550			
5	850	1650	8,5	250	350	900	3950	250	2270	4300			
6	1200	2400	12	300	400	1000	4650	300	2470	5100			
7	2200	4100	22	400	500	1200	4900	350	2870	5450			
8	3400	6700	34	500	700	1600	5250	400	3380	5850			
9	5000	9100	50	600	700	1800	6300	450	3580	6850			
10	8900	17000	90	800	1000	2200	7320	550	4270	7950			
11	13300	26000	135	1000	1200	2600	8700	650	4780	9555			

Dimensions and weights are approximate.
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Remarks:
 SGW = Jet Scrubber
 ABS = Separator
 DTA = Swirl Droplet Separator



Flow diagram of a single-stage jet scrubber

PILOT EQUIPMENT

Transportable Körting pilot equipment can be used before customised solutions are planned. Designed to handle gas flows of **300 m³/h** each, this equipment can be used to explore and try out new applications under real-world conditions directly on site.

KEY FIGURES

Gas volume flow	[m ³ /h]	60 ... 100 000
Liquid requirement per m ³ of gas	[l/m ³]	5 ... 65
Liquid pressure	[bar g]	1.5 ... 5
Relative velocity	[m/s]	10 ... 25
Pressure differential	[mbar]	3 ... 40
Dust separation efficiency (1 µm / 10 µm)	[%]	55 / 99
Absorption efficiency	[%]	> 99
Energy consumption	[kWh/1,000 m ³]	0.6 ... 7.5



For a practical questionnaire to answer an enquiry for a quote quickly and more information, go to: koerting.de/en/jet-scrubber.html



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