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GQ\_CB\_Dust\_Aspiration\_Systems\_EN\_14004\_02

Innovations for a **better world.**

**BÜHLER**

## Meeting legal emission limits. Achieving optimal protection against explosions.

An estimated one dust explosion occurs somewhere in Europe every day. The consequences can threaten the very existence of a company and cost millions in damage. Major dust explosions in agribusiness and the food industry show that such incidents are still occurring with disturbing regularity, despite improvements in construction. By employing dust aspiration solutions from Bühler Grain Quality and Supply, companies whose production processes result in significant amounts of dust can always be on the safe side.

Our innovative technologies and individual solutions set high standards in terms of safety, flexibility and cost effectiveness. In addition, we help to ensure that the legal emissions levels for dust are met and, thus, that the plant can continue to

operate without interruption, that downstream equipment is protected and that the bulk material can be stored with better capacity.



## Innovative Dust Aspiration Systems. For the entire value-added chain.



Rice mills



Feed mills



Grain Quality and Supply



Oil mills



Grain mills



Malthouses

Bühler dust aspiration systems can be used along the entire food value-added chain and meet all relevant market requirements:

- Explosive atmospheres are avoided for protection of employees, environment and plant
- Legal threshold values for dust emissions are met thereby keeping operating permits for plants in place without interruptions
- Machinery in downstream process is protected due to less dust exposure and storage capacity of bulk material is improved
- Innovative design allows flexible and process-oriented integration into the plant

# Powerful and versatile. **Bühler Dust Aspiration Systems.**



## Round filters

- Minimum consumption of compressed air with the same efficiency and reduced operating costs
- Certified and designed according to the currently relevant standards and guidelines for explosion protection

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## Spot filters

- No loss of product because dust is recycled back into product stream
- Dust-free working areas thanks to air being drawn off from the places of origin

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## Dust aspiration for reception hopper

- Flexible and individual design along with easy installation thanks to sustainable modular construction
- Top suction capacity via below floor and above floor aspiration through adjustable suction slits

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## Complete dust aspiration solutions

- The right combination for guaranteed operation – a compatible and coordinated system
- Everything from a single source and competent supplier

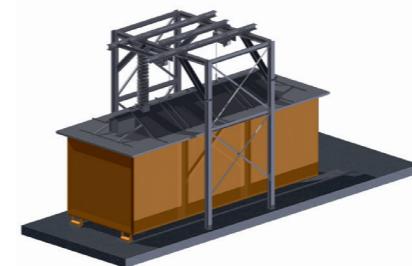
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## Cyclone

- Optimal degree of separation for high volumes with moderate requirements for residual dust content
- Compact, maintenance-free design at low cost

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## Container cover for dust loading

- Direct dust removal outside the building without any intermediate storage saves time and prevents new dust collection
- Plug & Play with easy to operate Bühler control system

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# Round filters.

## Environmentally friendly, efficient and safe.

Round filters are used for filtering dry or dry-wet particles from a dust-gas mixture. A fan draws the dust-laden air into the raw gas chamber of the filter and then through the fabric filter bag into the pure air chamber and blows the clean air into the open air. A first filtration already takes place through the tangential entry over the centrifugal separation on the wall of the raw gas chamber.

The remaining dust particles are deposited on the filter bags. The dust that accumulates on the bags over time causes the pressure loss to increase and therefore must be regularly removed. Cleaning the bags takes place in the pure air chamber using jets of compressed air at 2–6 bar.



Suitable for dry, non-caking dust. Air inlet at top.



Suitable for height restrictions in the plant and for humid, caking dust. With motor-driven discharge bottom. Air inlet at top.



### Customer benefits

- Legally defined emission values are met
- Highly efficient and economic flushing of the filter bags
- Optimal employee and plant protection and maximum plant uptime
- Guaranteed fit in the plant because of compact, modular design
- Long lifespan – thanks to rugged design and continuous life-cycle management
- Meets maximum allowable residual dust content
- Inexpensive compressed air cleaning thanks to Power Reflex Membrane

### Application examples

Round filters can be used in the following areas for dust aspiration:

- Machines
- Conveying systems
- Silos
- Intake hoppers and halls
- Other components

### Safety first – Our most important promise

Each filter and system component is backed by years of experience from our partners in the field of explosion protection who work intensely with us on the issue of safety, in addition to our own in-house expertise. A Bühler filter is

not just any filter, it's a filter with a promise. And you can be confident that the applicable legal regulations and standards will also be there along with the most recent technology.

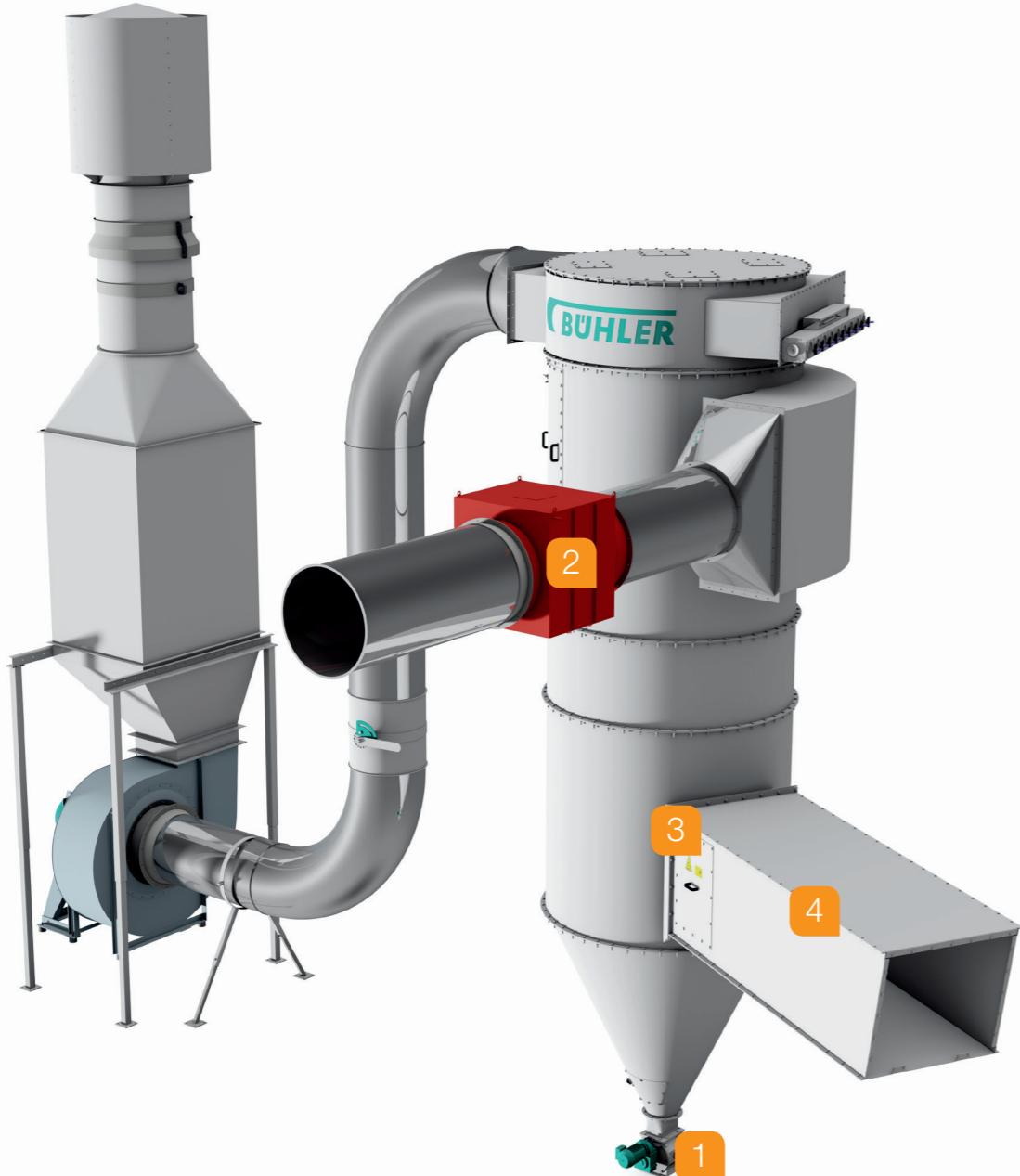
### Round filter portfolio and available filter surfaces

Type/bag length	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
RA 004	1.8	2.7	3.6	–	–	–	–	–
RA 009	4	6.1	8.1	10.1	–	–	–	–
RA/B 012	–	8.1	10.8	13.5	16.2	–	–	–
RA/B 021	–	–	18.9	23.6	28.3	33	37.7	–
RA/B 032	–	–	28.8	35.9	43.1	50.3	57.5	–
RA/B 045	–	–	40.4	50.5	60.6	70.8	80.9	91
RA/B 069	–	–	62	77.5	93	108.5	124	139.5
RA/B 088	–	–	66.4	86.2	106	125.7	145.5	165.3
RA/B 104	–	–	–	102.3	125.7	149	172.4	195.8
RA/B 120	–	–	–	115.4	142.3	169.3	196.2	223.2
RA/B 148	–	–	–	148	181	214	247	280
RA/B 164	–	–	–	–	201	238	275	312
RA/B 188	–	–	–	–	235	277	319	362
RA/B 216	–	–	–	–	275	324	372	420
RA/B 256	–	–	–	–	325,5	383	440,5	498

\* Special versions on request.

# Round filters. Optimal solutions with system.

Bühler as a solution provider and system supplier takes care of your dust from start to finish with an aspiration and discharge system geared to work together for the most economical operation: From selecting the right fan, which is the core of the aspiration system, through to explosion protection and explosion isolation systems all the way to the dust discharge.



1

## Rotary valve

- This discharge component is pressure-shock resistant and insulated for flame penetration
- Prevents unwanted air from entering and ensures safe dust discharge



2

## Check valve

- Safety tested: Certified according to DIN EN 16447 for protection against explosion by detaching
- Flexible integration into the duct thanks to variable spacing for installation



3

## Bursting disk

- For guaranteed safety in the event of an explosion, it opens to release explosion pressure and flames and thus prevents major damage
- Designed and calculated for each filter



4

## Flameless pressure relief

- The flameless pressure relief into the interior provides an optimal alternative to complex protective systems with discharge channels
- Allows process-optimized installation of the system

# Spot filters.

## Effectively counteract dust in conveying systems.

Bühler spot filters are employed for direct dust aspiration in conveying systems (horizontal as well as vertical). The slight negative pressure inside the spot filter draws off a small amount of air from the enclosed or semi-enclosed machine. The dust that adheres to the filter bags is subsequently recycled into the product stream via automatic compressed air jets.



Spot filter for dust containment on horizontal conveying systems.



Spot filter for dust containment on elevators.



Spot filter for dust containment on ship loaders.

### Spot filter portfolio and available filter surfaces

Version	Bag length	Filter surface	Fan flow volume	Fan pressure	Number of fans
FP-H/V-2	1.5	1.35	500 m³/h	850 Pa	1
FP-H/V-4	2	3.6	900 m³/h	1100 Pa	1
FP-H/V-6	2	5.3	1500 m³/h	1400 Pa	1
FP-H/V-9	2	8	2000 m³/h	1800 Pa	1
FP-H/V-12	2.5	13.5	3300 m³/h	1800 Pa	1
FPH-18-2.5	2.5	20	2800 m³/h	1650 Pa	2
FPH-27-2.5	2.5	30	4200 m³/h	1650 Pa	2
FPH-33-3.0	3	45	6300 m³/h	1650 Pa	2

The spot filter combines with the fan, silencer, compressed air tank and control to make a compact unit.

### Customer benefits

- No loss of product and no mixing of various dusts because dust feeds back into the product stream
- Dust-free work area – dust formation is contained so that no dust escapes
- No manual cleaning required – due to automatic cleaning of filter bags
- Easy replacement of filter bags – thanks to easy access on the raw gas side
- No air piping necessary

### Application examples

Spot filters can be used in the following areas for dust aspiration:

- Elevators
- Trough chain conveyors
- Belt conveyors
- Ship loaders



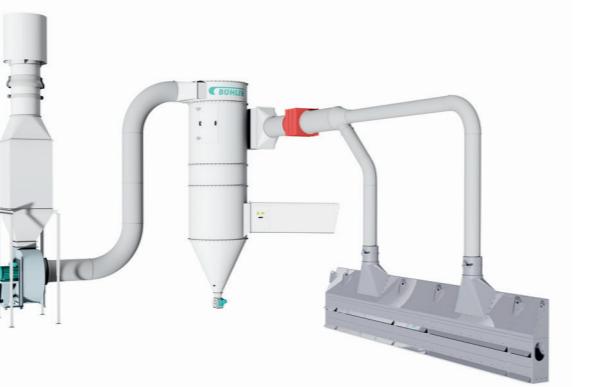
## Flexible hopper aspiration solutions. For optimal suction capacity.

Both filters for intake hoppers (decentralized) and aspiration panels (centralized) are capable of providing effective aspiration of intake hoppers. In the filter module, air is directly filtered at the hopper and the dust goes back into the hopper. In the aspiration panel, the dust is removed from the product stream and sent to a round filter.



### Customer benefits hopper filter

- Removal of dust from intake hoppers of different lengths possible due to modular design
- Top suction capacity via below floor and above floor aspiration through adjustable suction slits
- Great flexibility because installation is possible in existing and new plants
- Inexpensive even for long intake hoppers due to only one control unit for multiple modules



### Customer benefits aspiration panels

- Top suction capacity via below floor and above floor aspiration through adjustable suction slits
- Hall width can be narrower due to side filling and higher, more stable cabinets
- Easy maintenance due to 60° slope that prevents dust accumulation
- Simple installation of aspiration panels

### Application examples

Hopper dust aspiration solutions are used in the following areas:

- Collection and intake operations for grain and other bulk materials
- Handling terminals
- Processing industry



# Dust aspiration systems for cleaning machines. The perfectly matched system.

Current safety and environmental regulations make high-capacity fans just as essential today as modern filter systems. "Made by Bühler" guarantees uniform and standardized filter and dust aspiration system technology solutions for the smooth use of cleaning machines.

## Standardized technology for economic operation

- The corresponding dust aspiration solution using filters or cyclones, including all relevant system components, is already available for all models of the machine types TAS, GrainPlus, SMA 203-3 and 206-6 and SMA 202 in standard dimensions
- Employing the correct dust aspiration technology and coordinated system components has a significant influence on achieving the best possible cleaning results and makes operation energy-efficient and economic thanks to an optimal layout

## Everything from a single source

- Fast preparation of estimates and low engineering costs
- Complete machine and plant technology designed by Bühler experts
- One supplier for all spare parts



1

### Fan

- Our portfolio includes 65 different fans in 8 versions to complete the system covering volume flows of 20–1799 [m³/min] and pressures of 800–5999 [pa]
- Approved for installation in ATEX zones



2

### Silencer

- Including transition pieces and telescopic supports
- Sound reduction from -10 to -34 dB



3

### Deflector hood

- Enables pure air to be released into atmosphere
- Prevents rain or other matter from entering



4

### Air pipe system

- Designed by experts to ensure the necessary air speeds in the air pipe system
- Sturdily built to withstand vacuum pressure in the system

## Highly efficient cyclones. For optimal separation rate.

Cyclones are used for separating dust particles from the aspiration air similarly to a round filter. Since the cyclone does not obtain the same separation efficiency as a filter, it is mainly used when there is a low proportion of fine dust particles in the product or when the requirements for the residual dust content in the filtered air prior to release are moderate.

The cyclone is a centrifugal separator that obtains optimal separation rate in a compact form.



### Customer benefits

- No maintenance necessary – the cyclone forms a unit without electrical components
- Compact design at low costs – no explosion protection components required
- Assured discharge because suitable dust locks are available for any size
- Effective dust extraction for large volumes of air thanks to the eleven standardized sizes

### Application examples

Cyclones are especially suitable for dust aspiration in the following areas:

- Machines
- Conveying systems
- Silos
- Intake halls
- As total separator at high dust loads prior to the filter

### Cyclone portfolio

Model	Air Flow (m <sup>3</sup> /min)	Model	Air Flow (m <sup>3</sup> /min)
No. 35	16–23	No. 160	166–190
No. 55	24–65	No. 180	191–215
No. 83	66–100	No. 220	216–260
No. 100	101–120	No. 280	261–332
No. 120	121–140	No. 360	336–430
No. 140	141–165		

## Container cover for dust loading. Compact dust disposal.

Once dust-laden aspirated air has been filtered, the dust is often temporarily stored in building cells or packed up in bags. Bühler's container cover for dust loading is used to convey the filtered dust out of the building without unnecessary intermediary steps to an appropriate container.

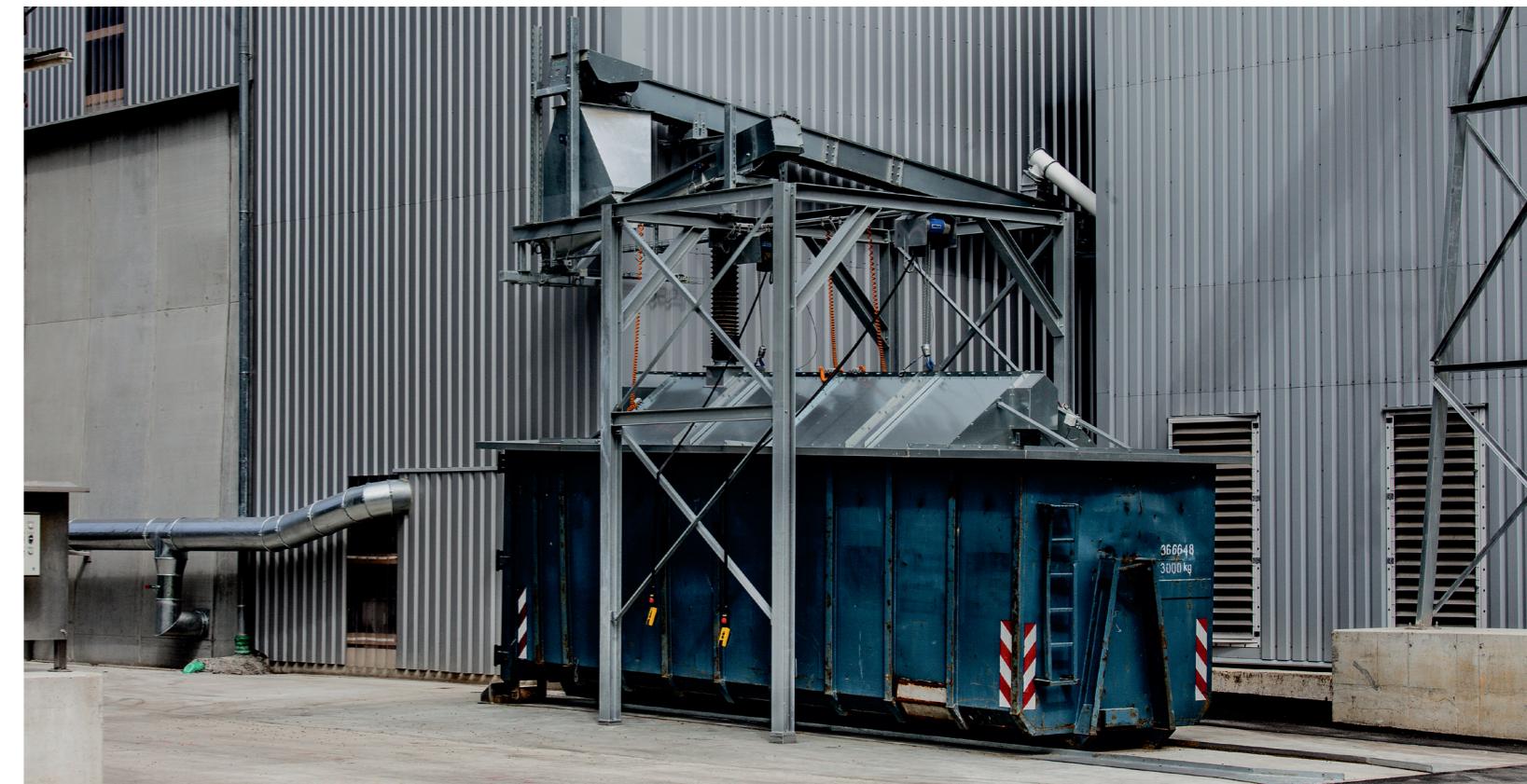
### Customer benefits

- Space and building independent – dust storage takes up no space within the building, which can be saved in new buildings, and becomes available after the conversion
- Direct dust removal without intermediate storage – container can be directly disposed of by truck, saving unnecessary handling steps
- Plug&Play – fully automated with an easy to operate control cabinet
- No new dust collects from loading the filtered dust – dust-free outdoor area in accordance with ATEX guidelines

### Application examples

The covered container for dust loading

- Can be used anywhere where dust needs to be removed from the system
- Can be used with commercial containers with a flat surface





## Long-term safety. Spare parts, training and maintenance.

Whether high-quality spare and wear parts, targeted education and training, innovative retrofits or quick repairs: We offer effective service solutions for sustainable business success. Together we will find the optimal solution for your business and your needs. We will be happy to advise you and look forward to your contacting us!



### Original Bühler spare parts

We provide our customers with high quality spare and wear parts long-term and rapidly. We assist in the identification of the correct parts and guarantee optimum compatibility for maximum performance and operational reliability.

- The correct part for the machine for guaranteed operation
- The safety concept of the plant can only be upheld with original spare parts
- Long-term and reliable availability of spare parts
- Everything from one source – one supplier for all spare parts

An overview over our complete services can be found under "Services" on our website [www.buhlergroup.com](http://www.buhlergroup.com)

### Education and training

Competent, well-trained employees are a key to success for a company. We provide our customers and their employees with professional, industry-specific knowledge and practical skills through individual training courses.

- Know-how transfer from the Bühler experts
- Optimum plant performance through sound process know-how
- Experience shared within the international Bühler network
- Practical examples and exercises in small groups for optimal, individual learning success

### Preventative maintenance

Our **Bühler Care** service contracts provide comprehensive, worldwide service for all components and systems. Using **ProPlant**, the customer-specific service management system from Bühler, it is possible to exactly plan and document maintenance for the system in a simple and clear way.

- Individual service solution to minimize risk
- Transparent and predictable service costs
- Highest productivity and plant availability
- Reduced operating costs
- Simple planning of service work