NETZSCH

Grinding & Dispersing

CONDUX Universal Mills CUM

The multi-system for dry grinding

our technology
YOUR SUCCESS

Individual and Flexible

CONDUX CUM Universal Mills can be used for a wide range of applications. Equipped with various grinding tools and stators, optimum adaptations to different processes are guaranteed, also for pressure-shock-proof, inert gas and cryogenic grinding plants.

CONDUX Universal Mills CUM combine all the advantages of modern grinding technology with a multitude of application possibilities. We can offer you a practical and highly-efficient machine design for a large range of different products.

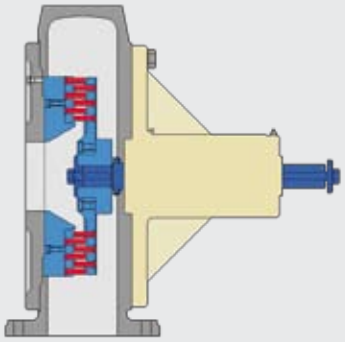
Easy and fast replacement of grinding elements offers flexibility in a wide field of applications and reduces down times.

Universal Mill CUM 680

be flexible

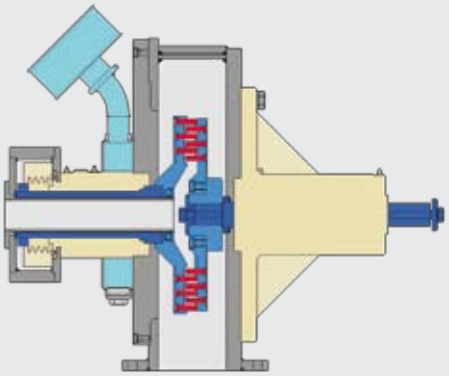
Pin Disc

for crystalline and brittle products.
The fineness is mainly set by speed adjusting the rotor disc (peripheral speed up to 150 m s^{-1}). Moreover, it is possible to influence the fineness by changing the number of pins and their arrangement.
Product finenesses: < 50 µm



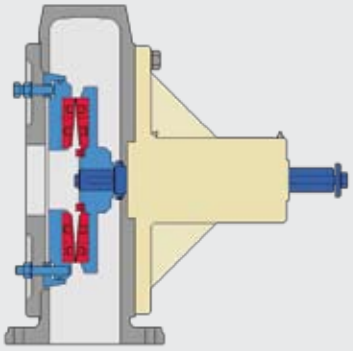
Pin Discs, Counter Rotating Design

With the assembly of a second drive on the door of the housing of the Universal Mill, the stator disc of the single-disc pin mill is changed into a rotor disc as well. Due to the counter rotation of these two pin discs the relative peripheral speed is increased up to 250 m s^{-1}. This machine type can be used for similar applications as the conventional single pin disc mill. However, the focus is clearly in the field of ,,cryogenic grinding".
Product finenesses: < 30µm



Grinding Discs

for brittle to elastic products with little residual moisture.
Depending on the product, the grinding discs are provided with a certain number of ground shearing edges. Additionally, the product size is determined by adjustment of the disc gap and the speed of the rotor.
Product finenesses: < 400 µm



Universal & customized

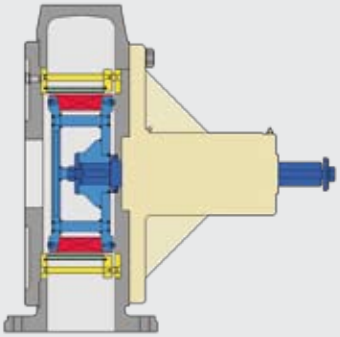
Rotors

High-performance rotors in welded executions are used in combination with various stator baskets for high operational demands and to give final finenesses free of oversized particles. The choice of rotor to be used is made based on the required final fineness as well as the properties of the product to be ground:

Blast Rotor

for brittle to tough-elastic materials and even crystalline products with dry to moist consistencies.

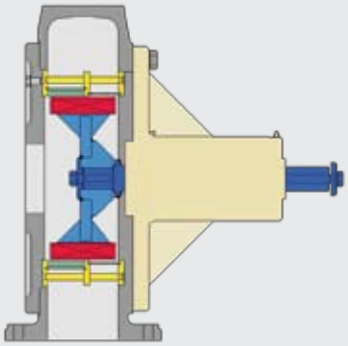
The blast rotor generates a large amount of air flow due to the great number of exchangeable beater blades. This also allows processing of temperature-sensitive products. Product fineness can be varied by adjusting the peripheral speed and/or by using different stators.
Product finenesses: < 100 µm



Wing Beater

for brittle to tough-elastic products with dry to highly moist consistencies.

Product fineness can be varied by adjusting the peripheral speed and/or by using different stators.
Product finenesses: < 500 µm



Stators

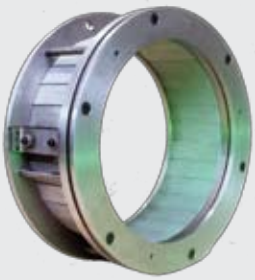
Together with the wing beater and the blast rotor, correspondingly designed stators are used. The various types of stators are mainly necessary to meet the requirements of the different products and in order to achieve the desired fineness:

Screen Basket

This basket in screwed design with screen track completely encloses the rotor (360°). This stator type is quite frequently used for crystalline products.

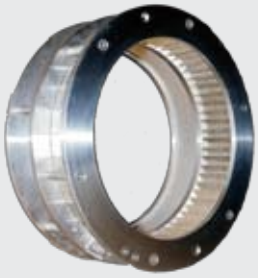
Grinding Basket

The ground product is discharged through a narrow discharge gap at the back end of the grinding track. This stator type is mainly used for temperature-sensitive products.



Screen / Grinding Basket

Combination of a screen basket and a grinding basket. Grinding track elements as well as screen inserts with perforations as selected are assembled inside a screwed and closed stator basket.



Effective and Economical

Grinding tools for many different grinding tasks are available to give the most effective and economical processing with our Universal Mill Type CUM.

Multiple Installation Variants

Standard Grinding Units

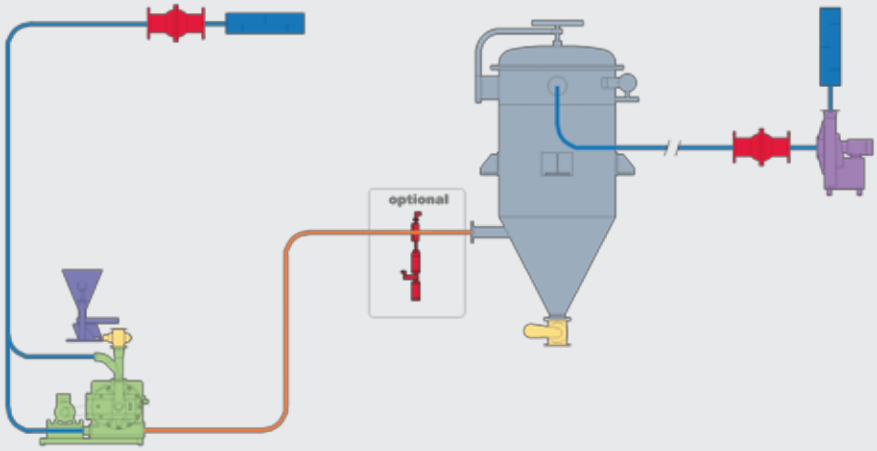
We offer a wide range of standard plants for the processing of products that are not potentially explosive and can therefore be processed under normal operating conditions. This example shows a one-level assembly of a complete plant with dosing station, Universal Mill CUM with pneumatic product transfer into the fully automatic dust filter. Depending on the field of application, this grinding plant can be assembled with a cyclone separation. In this case the final product is separated directly via a high-performance cyclone and discharged by a rotary valve or similar unit.

The version with silo offers another alternative. The Universal Mill is placed directly above the silo. The mill discharges the product directly into the silo, which is equipped with a flap valve or rotary valve for discharging the product. It is also possible to discharge the product directly into drums. The product is de-aerated/filtered via a bunker filter installed next to the Universal Mill on top of the silo. Filter residues after filter cleaning go directly back into the silo. With machines of this design the product is discharged and filled into drums at one point. There is no product loss due to dust extraction.

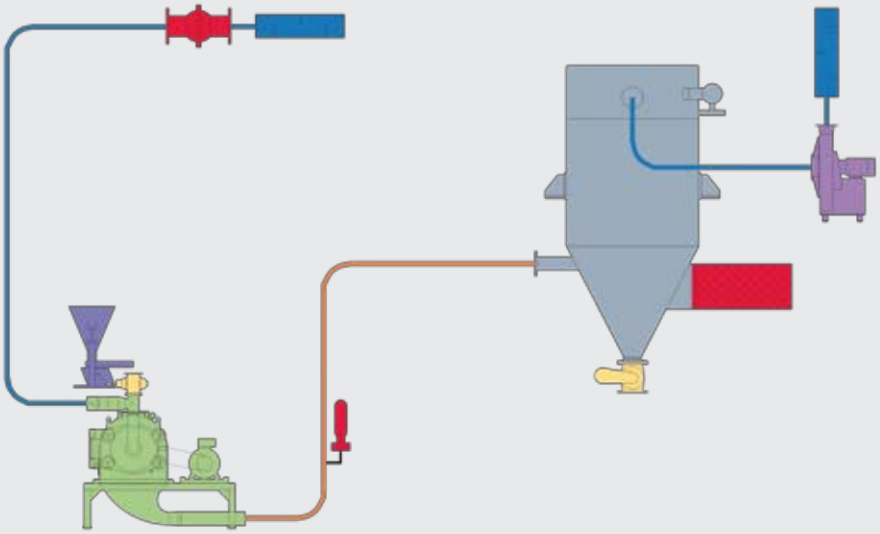
Pressure-Shock-Resistant Grinding Plants

For the fine-grinding of potentially explosive products we offer grinding plants pressure-shock-resistant up to 10 bar (g) or plants with pressure relief.
Our customers frequently use the before mentioned standard grinding units with one-level assembly and pneumatic product transport as a basis for this task. Depending on the machine design all components of the machine are pressure-shock-resistant up to 10 bar (g) or for a reduced explosion pressure.

Moreover, pressure-shock-resistant and flame-proof rotary valves, quick lock slide valves and Ventex valves are included in the standard design for pressure isolation. Fire extinguishing devices with detection- and control systems can be added if necessary or desired. Pipeline systems with relief canals or similar units are other extras that are used for the planning of explosion proof grinding plants.



Pressure-shock resistant grinding plant up to 10 bar (g)



Pressure-relieved grinding plant

ATEX conformity

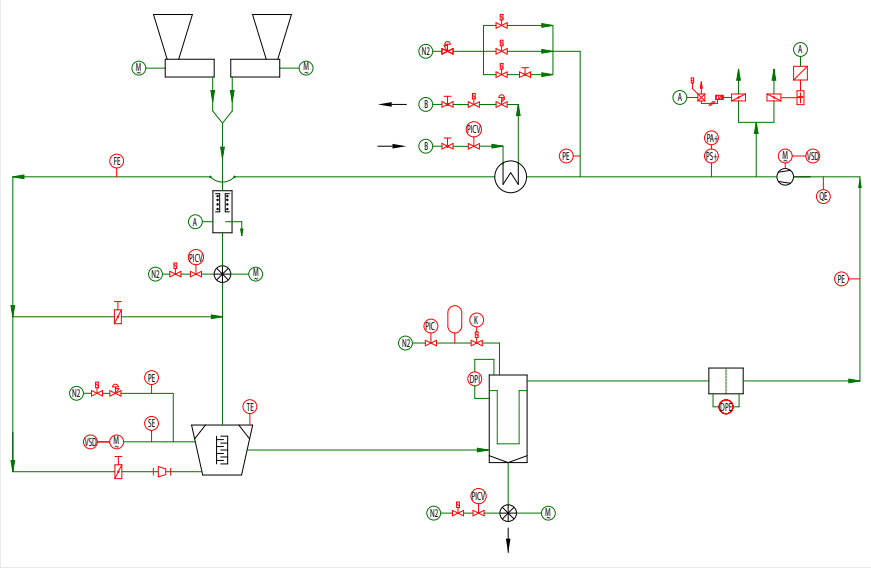
EC-TYPE EXAMINATION CERTIFICATE
under the directive 94/9/EG, Appendix III

II 1 (i) D / 2 (o) D c 100 °C
IBExU04ATEX1185X

Also for special requirements

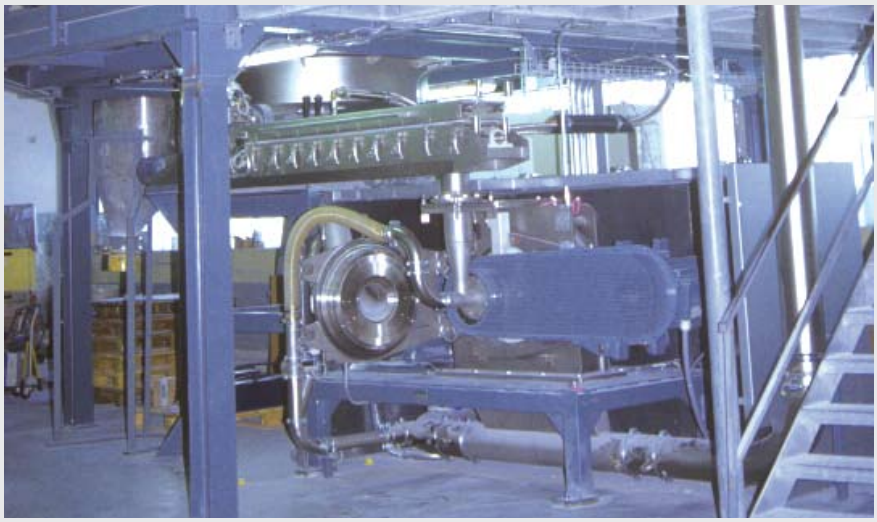
Inert Gas Grinding

This machine type is used for processing potentially explosive products and materials that tend to oxidate or change their properties in contact with oxygen. These inert gas grinding plants are always designed for closed loop operation. After product separation the inert gas is guided via a safety filter and a heat exchanger back to the suction side of the Universal Mill. During the operation of the plant the oxygen content of the atmosphere inside the plant is permanently monitored and kept below a certain level. Additionally the plant is operated with a low overpressure.



Cryogenic Grinding

Cryogenic Grinding plants are designed for products that cannot be ground to the desired final grain size at ambient temperature and to avoid loss of quality like e.g. loss of essential oils or damage by heat. These plants are generally based on our standard assembly, however, between the actual product feeding and the Universal Mill a correspondingly dimensioned screw cooler is installed, in which the fed product is frosted and made brittle by LN_2 before the actual grinding process.



Compact Plant

The grinding of dust explosive products places particularly high demands on the technology used and the design of a grinding plant with regard to safety. The most frequently used variant is a complete grinding system which is pressure shock resistant up to 10 bar (g). However, this usually means considerable costs for peripheral equipment.

With the new ATEX-compliant plant concept CUM *Compact*, the installation of a more efficient grinding plant for many products is considerably easier: With this newly developed plant concept explosion protection valves or explosion suppression equipment, explosion-decoupling devices, ventilators and even dust filter systems are no longer required in the classical sense.

In contrast to conventional grinding plants, the processing gas in the new Universal Mill CUM *Compact* is circulated. A pressure shock resistant rotary valve feeds the product directly into the mill. After the product has been ground, it leaves the machine through another valve at the bottom of the mill.

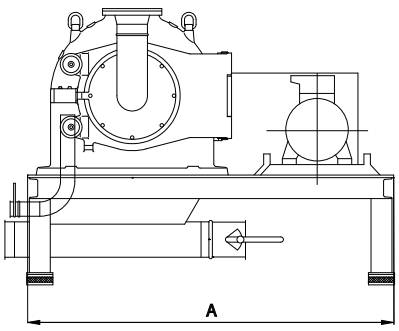
The additional rinsing air fed through the valves and mill bearing is continuously discharged by the system to prevent a buildup of pressure. The mini-aspiration filter specifically designed for these small amounts, prohibits the uncontrolled escape of dust through the product feed- and discharging valves. A downstream injector generates the low pressure needed by the system.

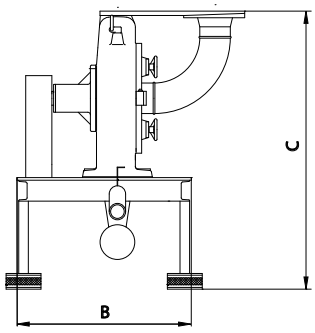
The heat generated inside the mill during milling is removed with the product when it leaves the machine, without any damage to the product itself. For this reason no processing air or equipment is needed for cooling. For example, the max. temperature increase of ground powdered sugar (fineness 99% < 200 µm) is a ΔT of 25°C.

Applications
Technical Data

Examples of Products	Fineness [µm]	Size	Capacity [kg h^{-1}]
Ammonium chloride	50 - 100	CUM 150	200 - 250
Aniseed	$d_{98,5}$ < 800	CUM 680	900 - 1 300
Calcium carbonate	$d_{99,9}$ 20-22	CUM 300	1 800
Calium nitrate	10 - 200	CUM 280	20 - 30
Carbon black	d_{98} 45	CUM 150	200 - 300
Cellulose derivative (CMC)	d_{99} 250	CUM 1250	1 800 - 2 100
Cellulose derivative (EHEC)	d_{97} 475	CUM 680	1 250
Cellulose derivative (HPMC)	< 1500	CUM 900	480
Chilli peppers	2% > 500	CUM 1250	1 500
Cork	30,5% > 630	CUM 680	320
Corn starch	< 400	CUM 250	200
Cosmetic products	d_{90} < 30	CUM 250	100
Grain (wheat)	93% < 250	CUM 450	500
Grain flakes	< 500	CUM 450	1 000
Graphite	100-200 mesh	CUM 300	907
HDPE	d_{95} 1000	CUM 300	140
LDPE	< 500 µm	CUM 680	400
Paprika	< 400 - 500	CUM 680	240 - 480
PTFE	d_{96} 500	CUM 680	260 - 340
PVC (hard)	d_{90} < 1000	CUM 680	500
SEBS	90% < 800 / 1680	CUM 1250	850 - 1300
Sodium bicarbonate	d_{50} 10	CUM 100	25
Sodium carbonate	d_{90} < 100	CUM 900	7 500
Sugar	< 400 my	CUM 150	400 - 500
Sugar	d_{95} 100 µm	CUM 680	2 500
Sugar	80% <100	CUM 450	2 000
Sugar	99% < 350	CUM 450	3 000 - 3 500
Sugar substitute	25 - 30% < 150	CUM 680	3 000
Talcum	45 - 50% < 63	CUM 680	7 000
UHMWPE	< 800 µm	CUM 450	100
Urea	200 - 1200	CUM 300	500 - 600
Wheat gluten	98% < 2000	CUM 680	7 000 - 8 000
Wood flour	20% > 250	CUM 680	500

Size	CUM	150	250	300	450	680	900	1250	1600
Power factor		0.38	0.7	1	2	4	6.5	11	17
Pin Discs									
Diameter	ø mm	150	250	330	500	750	900	1 250	1 600
Speed	min^{-1}	16 000	12 000	9 200	5 500	3 600	3 200	2 200	1 700
Drive power	kW	4	11	18,5	37	75	110	200	200
Air volume (nom.)	$m^3\ h^{-1}$	410	760	1 100	2 170	4 380	7 050	12 330	18 740
Pin Discs, Counter Rotating Design									
Speed housing	min^{-1}	-	-	8 000	5 400	3 600	2 950	2 200	-
Speed door	min^{-1}	-	-	6 400	2 950	2 100	1 600	1 200	-
Drive power	kW	-	-	22 + 15	45 + 30	90 + 55	110 + 90	200 + 160	-
Air volume (nom)	$m^3\ h^{-1}$	-	-	1 050	2 300	4 640	7 470	13 070	-
Grinding Discs									
Diameter	ø mm	170	-	300	500	800	-	-	-
Speed	min^{-1}	16 000	-	9 200	5 500	3 450	-	-	-
Drive power	kW	5,5	-	22	45	90	-	-	-
Air volume (nom.)	$m^3\ h^{-1}$	540	-	1 300	2 850	5 750	-	-	-
Blast Rotor									
Diameter	ø mm	170	244	300	450	680	900	1 250	1 600
Speed	min^{-1}	12 000	9 000	7 350	4 600	3 100	2 500	1 680	1 350
Drive power	kW	4	11	18,5	37	75	110	200	315
Air volume (nom.)	$m^3\ h^{-1}$	570	1 050	1 490	2 690	5 970	9 610	16 800	25 560
Wing Beater									
Diameter	ø mm	170	244	300	450	680	900	1 250	1 600
Speed	min^{-1}	9 000	6 000	4 900	3 200	2 400	1 650	1 150	900
Drive power	kW	3	7,5	11	22	45	75	110	110
Air volume (nom.)	$m^3\ h^{-1}$	350	650	930	1 840	3 710	5 980	10 460	15 910
Length (A)	mm	1 100	1 640	1 550	2 000	2 750	3 700	3 850	4 370
Width (B)	mm	550	800	850	1 000	1 200	1 750	1 750	2 300
Height (C)	mm	800	1 800	1 050	1 500	2 000	2 410	3 120	3 315
Weight approx.	kg	230	390	625	1 480	2 990	6 660	9 690	21 000





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The World's Leading Grinding Technology

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The NETZSCH Group is an owner-managed, internationally operating technology company headquartered in Germany. Three Business Units – Analyzing & Testing, Grinding & Dispersing, and Pumps & Systems – provide tailored solutions for highest-level needs. Over 2200 employees at 125 sales and production centers in 23 countries across the globe guarantee that expert service is never far from our customers.

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