NETZSCH

Proven Excellence.

NETZSCH Fine Impact Mill *CONDUX*®

The Multi-System for Dry Grinding

Business Unit
GRINDING & DISPERSING

Individual and Flexible

Condux® fine impact mills can be used for a wide range of applications. Equipped with various grinding tools and stators, optimum adaptations to suit different processes are guaranteed, also for pressure-shock-proof, inert gas and cryogenic grinding plants.
Condux® combines 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.

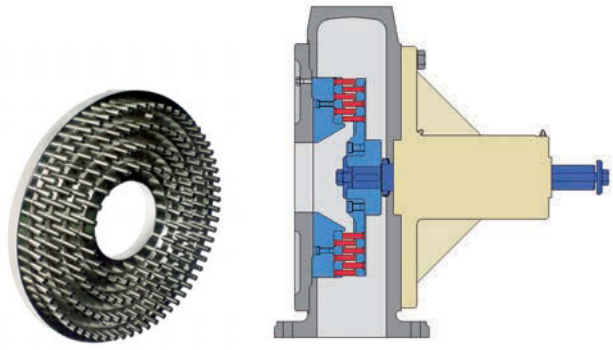
Condux® 1600

be flexible

Pin Discs

for crystalline and brittle products.
The milling fineness is mainly set by adjusting the speed of 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.

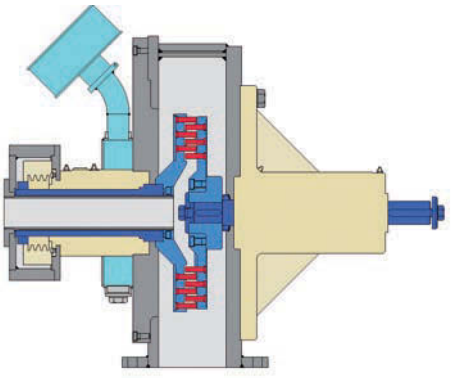
Product finenesses: < 50 µm



Pin Discs, Counter Rotating Design

By installing a second drive on the door of the housing of the impact mill, the stator disc of the single-disc pin mill also becomes a rotor disc. 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".

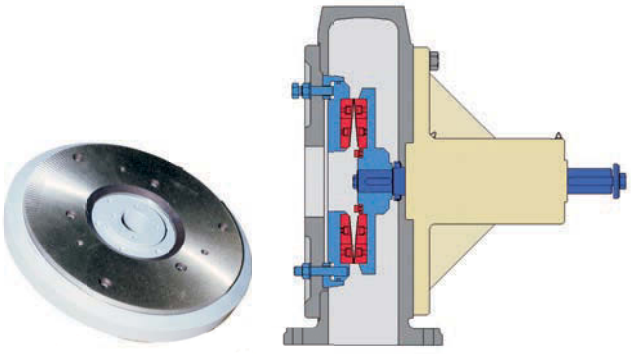
Product finenesses: < 30µm



Grinding Discs

for brittle to ductile-elastic products with low residual moisture.
Depending on the product, the grinding discs are equipped 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 disc.

Product finenesses: < 400 µm



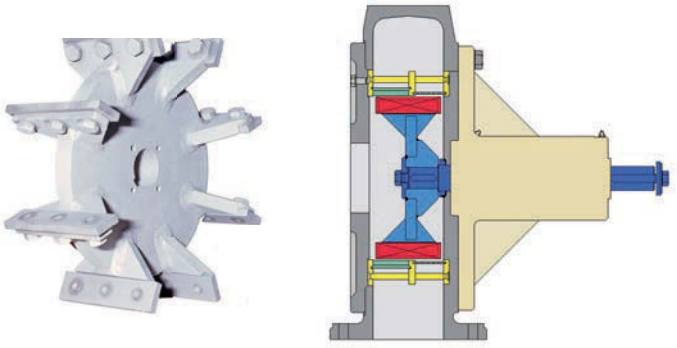
Effective and Economical

Rotor / Stator

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

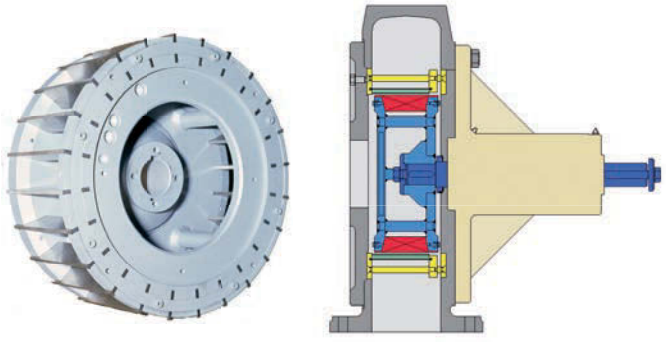
Wing Beater

for brittle to ductile-elastic products with dry to fairly moist consistencies.
Product fineness can be varied by adjusting the peripheral speed and/or by using different stators.
Product finenesses: < 500 µm



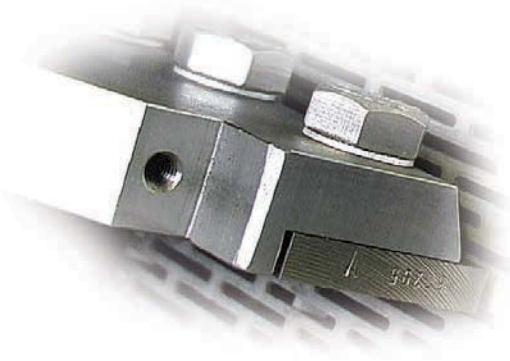
Blast Rotor

for brittle to ductile-elastic materials and even crystalline products with dry to moist consistencies.
The blast rotor generates a high air flow due to the great number of exchangeable beater blades. This means that temperature-sensitive products can also be processed.
Product fineness can be varied by adjusting the peripheral speed and/or by using different stators.
Product finenesses: < 100 µm



Screen Basket/Grinding Basket

A basket in screwed design encloses the rotor (360°).
Depending on the application the basket is equipped with a continuous screen track (perforation according to choice) or individual grinding elements with coarser or finer corrugation. A combination of screen track and grinding elements is possible as well.



Rotor / Classifier

With the newly designed execution of the Impact Mill *Condux®* with an integrated dynamic air classifier, higher finenesses and exact upper particle size limit can be achieved. The simple housing construction means that cleaning can be carried out rapidly. Unlike conventional classifier mills, grinding disc and classifier wheel are torque proof connected and are driven by one motor.

Grinding Classifier

for ductile and crystalline products with dry consistency.
The mill execution can be used for all applications for which two-rotor classifier mills of conventional construction seem too complex and of which the final fineness cannot be obtained with normal pin- and blast mills.

Changing of the grinding fineness is carried out by adjusting the speed of the grinding disc-/classifier-combination and can also be done by changing the height of the classifier wheel. The air volume flow can also be adapted. Product fineness < 30 µm.

Grinding tools for many different grinding tasks are available to give the most effective and economical processing.

It is very easy to vary the setting of the separation limit by adjusting the height of the classifier wheel.

Multiple Installation Variants

Standard Grinding Units

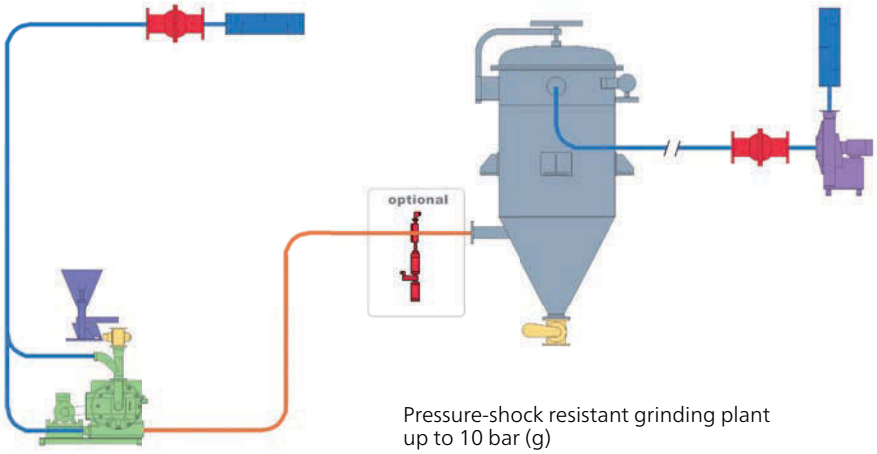
We offer a wide range of standard plants for the processing of products that are not potentially explosive and can therefore be processed under normal operating conditions. This example shows a one-level assembly of a complete plant with dosing station, mill with pneumatic product conveying into the fully automatic dust filter. Depending on the field of application, this grinding plant can be assembled with an intermediate 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 product bunker offers another alternative. The impact mill is placed directly above the bunker. The mill discharges the product directly into the bunker, 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 top filter installed next to the Impact Mill *Condux*® on top of the bunker. Filter residues after filter cleaning go directly back into the product bunker. With machines of this design the product is discharged and filled into drums at one point. There is no product loss due to dust filtration.

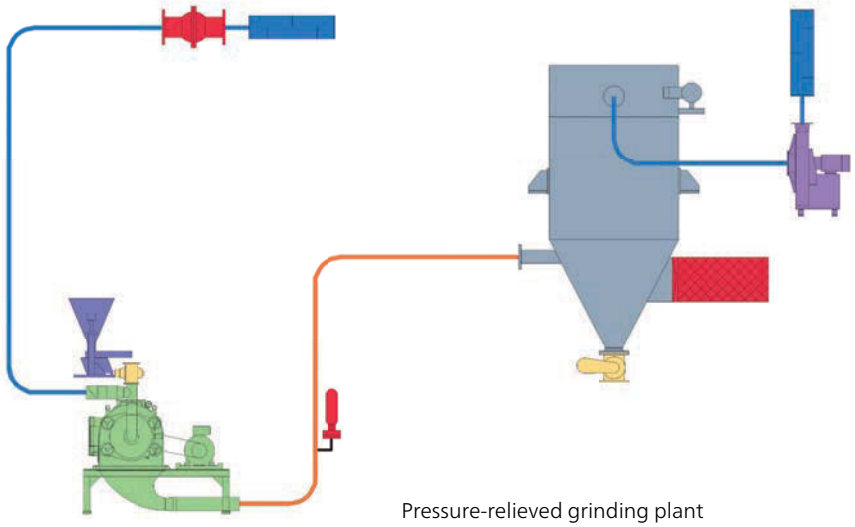
Pressure-Shock-Resistant Grinding Plants

For the fine-grinding of potentially explosive products we offer complete grinding plants pressure-shock-resistant up to 10 bar (g) or plants with pressure relief.
Our customers frequently use the above mentioned standard grinding units with a 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 designed for a reduced explosion pressure overload.

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 which 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

Condux® Compact

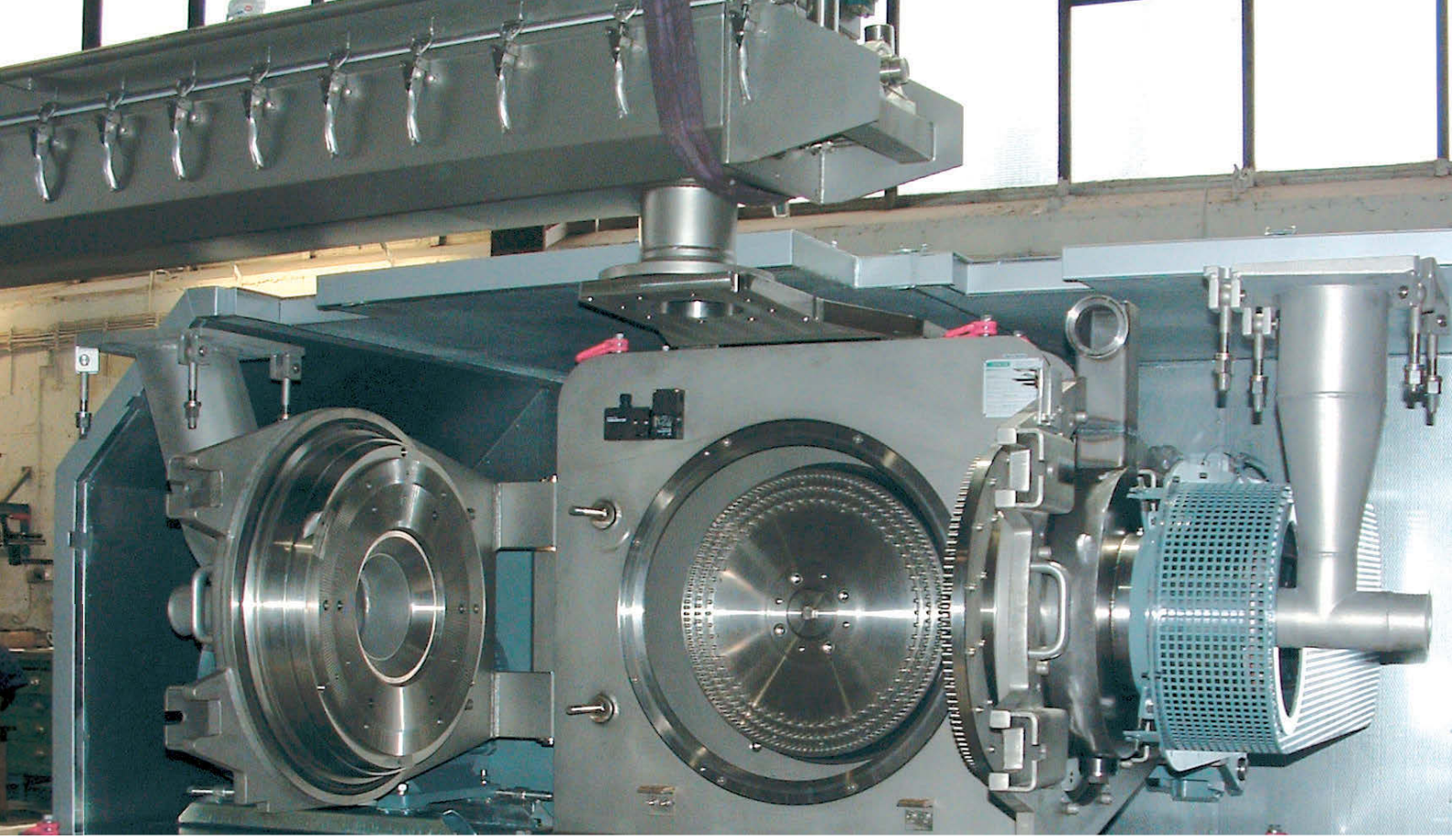
The grinding of dust explosive products places particularly high demands on the technology used and the design of a grinding plant with regard to safety. The most frequently used variant is a complete grinding system which is pressure shock resistant up to 10 bar (g). However, this usually means considerable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

With the new ATEX-compliant plant concept *Condux® 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 *Condux® 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.

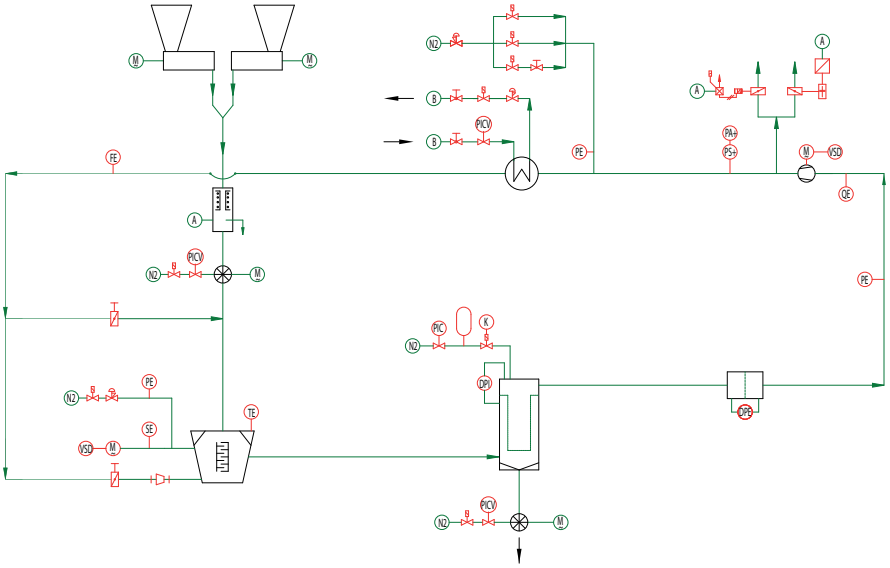
The additional rinsing air fed through the valves and mill bearing is continuously discharged by the system to prevent a buildup of pressure. The mini-aspiration filter specifically designed for these small amounts, prevents the uncontrolled escape of dust through the product feed- and discharging valves.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



Cryogenic Grinding

Cryogenic grinding plants are designed for products that cannot be ground to the desired final particle size at ambient temperature and to avoid loss of quality such as 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 mill a screw cooler is installed, in which the fed product is pre-frosted and made brittle by LN_2 before the actual grinding process.



Inert Gas Grinding

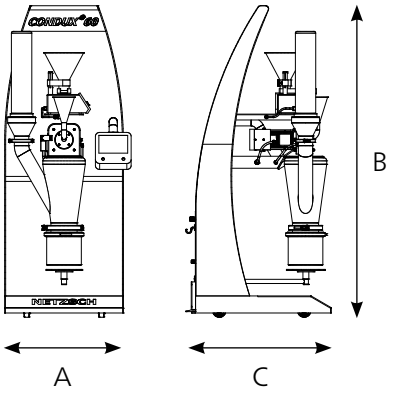
This machine type is used for processing potentially explosive products and materials that tend to oxidate or change their properties in contact with oxygen. Such inert gas grinding plants are always designed for closed loop operation. After product separation the inert gas is guided via a safety filter and a heat exchanger back to the suction side of the 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 pressure slightly higher than the ambient pressure.

Applications

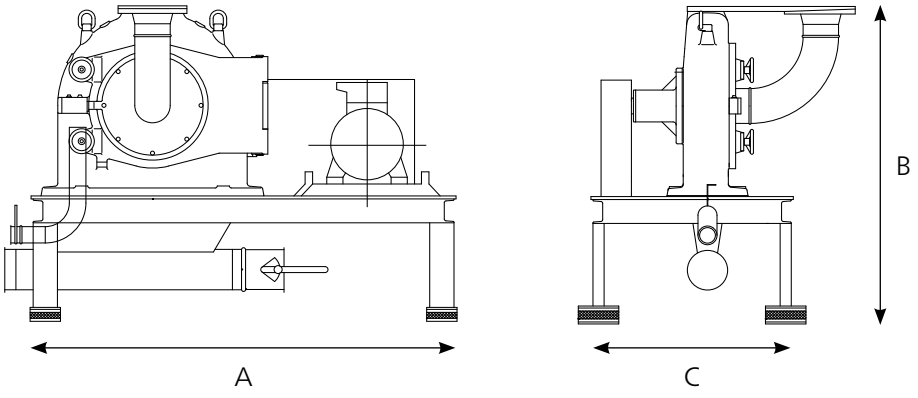
Examples of Products	Fineness [µm]	Size	Capacity [kg h^{-1}]
Ammonium chloride	50 - 100	*Condux*® 150	200 - 250
Aniseed	$d_{98,5}$ < 800	*Condux*® 680	900 - 1 300
Calcium carbonate	$d_{99,9}$ 20 - 22	*Condux*® 300	1 800
Carbon black	d_{98} 45	*Condux*® 150	200 - 300
Cellulose derivative (CMC)	d_{99} 250	*Condux*® 1250	1 800 - 2 100
Cellulose derivative (EHEC)	d_{97} 475	*Condux*® 680	1 250
Cellulose derivative (HPMC)	< 1 500	*Condux*® 900	480
Chilli peppers	2 % > 500	*Condux*® 1250	1 500
Cork	30.5 % > 630	*Condux*® 680	320
Corn starch	< 400	*Condux*® 220	200
Cosmetic products	d_{90} < 30	*Condux*® 220	100
Grain (wheat)	93 % < 250	*Condux*® 450	500
Grain flakes	< 500	*Condux*® 450	1 000
Graphite	100 - 200	*Condux*® 300	907
HDPE	d_{95} 1 000	*Condux*® 300	140
LDPE	< 500	*Condux*® 680	400
Paprika	< 400 - 500	*Condux*® 680	240 - 480
Potassium nitrate	10 - 200	*Condux*® 220	20 - 30
PTFE	d_{96} 500	*Condux*® 680	260 - 340
PVC (hard)	d_{90} < 1 000	*Condux*® 680	500
SEBS	d_{90} < 800 / 1 680	*Condux*® 1250	850 - 1 300
Sodium carbonate	d_{90} < 100	*Condux*® 900	7 500
Sugar	< 400	*Condux*® 150	400 - 500
Sugar	d_{95} 100	*Condux*® 680	2 500
Sugar	80 % < 100	*Condux*® 450	2 000
Sugar	99 % < 350	*Condux*® 450	3 000 - 3 500
Sugar substitute	25 - 30 % < 150	*Condux*® 680	3 000
Talcum	45 - 50 % < 63	*Condux*® 680	7 000
UHMWPE	< 800	*Condux*® 450	100
Urea	200 - 1 200	*Condux*® 300	500 - 600
Wheat gluten	98 % < 2 000	*Condux*® 680	7 000 - 8 000
Wood flour	20 % > 250	*Condux*® 680	500

Technical Data

Size	CONDUX®	60	150	220	300	450	680	900	1250	1600
Power factor		–	0.3	0.6	1	2	4	6	11	17
Pin Discs										
Diameter	ø mm	60	150	220	330	500	750	900	1 250	1 600
Speed	min^{-1}	30 000	16 000	13 000	9 200	5 500	3 600	3 200	2 200	1 700
Drive power (max.)	kW	1.1	5.5	11	22	45	90	132	250	355
Pin Discs, Counter Rotating Design										
Speed housing	min^{-1}	–	–	11 750	8 000	5 400	3 600	2 950	2 200	–
Speed door	min^{-1}	–	–	9 500	6 400	2 950	2 100	1 600	1 200	–
Drive power (max.)	kW	–	–	11+7.5	22+15	45+30	90+55	110+90	200+160	–
Grinding Discs										
Diameter		–	150	220	300	500	800	–	–	–
Speed	min^{-1}	–	16 000	13 000	9 200	5 500	3 450	–	–	–
Drive power (max.)	kW	–	5.5	11	22	45	90	–	–	–
Blast Rotor										
Diameter		60	150	220	300	450	680	900	1 250	1 600
Speed	min^{-1}	30 000	12 000	10 000	7 350	4 600	3 100	2 500	1 680	1 350
Drive power (max.)	kW	1.1	5.5	11	18.5	37	75	110	200	315
Wing Beater										
Diameter		60	150	220	300	450	680	900	1 250	1 600
Speed	min^{-1}	23 000	9 000	6 700	4 900	3 200	2 400	1 650	1 150	900
Drive power (max.)	kW	1.1	4	7.5	11	22	45	75	132	200
Grinding Classifier										
Diameter		–	150	220	300	450	680	900	–	–
Speed	min^{-1}	–	12 000	10 000	7 350	4 600	3 100	2 500	–	–
Drive power (max.)	kW	–	5.5	11	18.5	37	75	110	–	–
Size and Weight										
Length (A)	mm	700	1 100	1 400	1 550	2 000	2 750	3 700	3 850	4 370
Width (B)	mm	800	550	800	850	1 000	1 200	1 750	1 750	2 300
Height (C)	mm	1 825	800	900	1 050	1 500	2 000	2 410	3 120	3 315
Weight approx.	kg	250	230	390	625	1 480	2 990	6 660	9 690	21 000



CONDUX® 60



CONDUX® 150 - CONDUX® 1600

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