

CUTTING MILL SM 300

The High-Performance Model with RES Technology



Cutting mills are suitable for the grinding of soft, medium-hard, tough, elastic, fibrous, and heterogeneous mixes of products. Thanks to the powerful 3 kW drive with high torque and RES technology, the Cutting Mill SM 300 excels especially in the tough jobs where other cutting mills fail. This mill allows for perfect adaptation to application requirements by variable speed from 100 to 3,000 min⁻¹. A range of bottom sieves with aperture sizes from 0.25 - 20 mm is available, ensuring a defined final fineness.



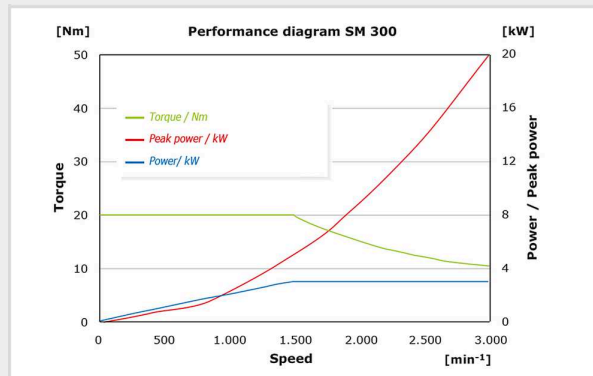
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Product Video

RES TECHNOLOGY - PEAK POWER OF UP TO 20 KW

HIGH TORQUE & RES TECHNOLOGY

An additional flywheel mass accounts for a very high torque which enables the SM 300 to grind many materials to analytical fineness in only one working run (RES Technology, see graphic on the right). The extra peak power derived from the flywheel mass is used to overcome potential blockages, even when grinding particularly tough materials. Additionally, the RES technology enables quick sample feeding.



The diagram shows the torque (green) and the power (blue) of the drive as well as the temporarily achievable peak power (red) against the speed. The peak power increases over the entire speed range. That means, the higher the speed, the more power is temporarily available for the cutting events.

CUTTING MILL SM 300

SUPERIORITY IN DETAIL

CYCLONE-SUCTION-COMBINATION

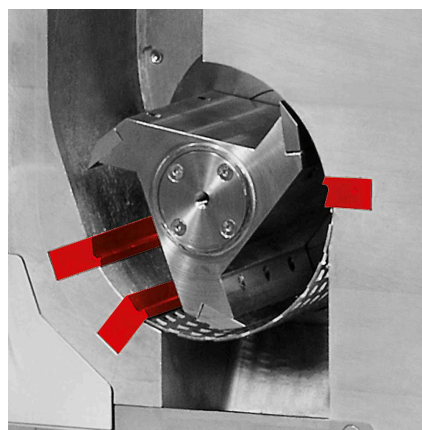


Ideal for light & heat-sensitive materials

When operated with the optional cyclone-suction-combination, the SM 300 is also suitable for grinding low-density or heat-sensitive sample materials.

- | Efficient cooling of sample and cutting tools
- | Improved sample discharge from the grinding chamber
- | Particularly suitable for large volumes
- | The cyclone accommodates sample bottles of 0.5 – 1 – 2 – 5 and 30 liters

DOUBLE ACTING CUTTING BARS

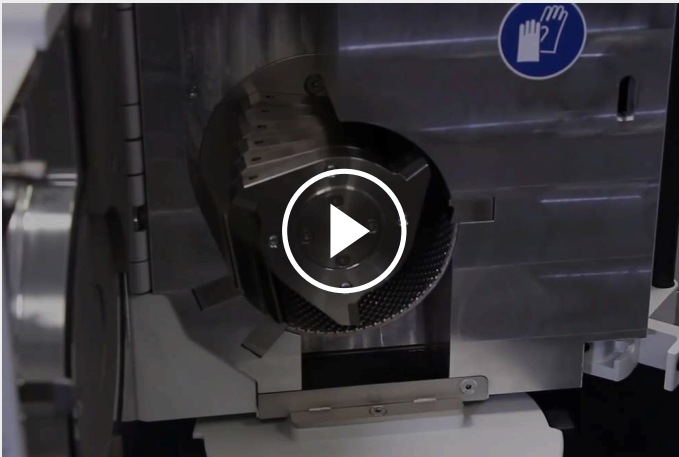


The SM 300 is equipped with double acting cutting bars which substantially increase the number and effectiveness of the cutting events. The parallel section rotor, for example, generates 18 cutting events per rotation.

CUTTING MILL SM 300

EASY OPERATION & CLEANING

CONVENIENT OPERATION



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Operation of the SM 300 is exceptionally simple and safe. The push-fit rotor and bottom sieves can be easily removed without tools. A safety switch prevents the mill from being started with the door open. An electronic safety check ensures that the door cannot be opened when the motor is running.

QUICK AND EASY CLEANING

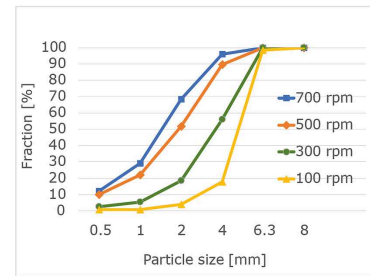


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The hopper can be folded back to get full access to the grinding chamber which, in combination with the smooth surfaces, greatly facilitates cleaning the mill. So does the design of the bottom sieves which reduces trapping of sample pieces to a minimum.

SPEED REDUCTION - LESS FINES, LESS TEMPERATURE RISE

Reduction of the speed leads to a decreased fine fraction of the sample and to more particles within the desired size range. Especially for this type of application, the lowest speed of the SM 300 was reduced to 100 min⁻¹. This is also beneficial for grinding heat-sensitive materials: reduced speed results in less energy input, preventing the sample from getting too warm during the process.



316L STAINLESS STEEL VERSION FOODGRADE

For applications like small scale production of food or cosmetics, the SM 300 is available in a stainless steel 316L foodGrade version which meets the guidelines of the food and pharma industry. It is equipped with a long-stock hopper for easy feeding of materials like cannabis plant parts. All parts in contact with the sample are made of 316L in this configuration. Optionally, the rotor blades and the cutting bars are made of a FDA-certified stainless steel which is less prone to wear under constant stress than 316L.



The unit can be equipped with an optional cyclone and a large 30 l receptacle (both stainless steel 316L) for collecting large sample amounts. Smooth surfaces lead to almost 100% sample recovery and easy cleaning.

CUTTING MILL SM 300

ACCESSORIES FOR SAFE AND EFFECTIVE GRINDING PROCESSES



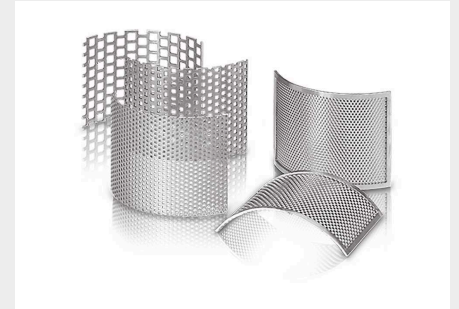
ROTOR TYPES

A parallel section rotor, a 6-disc rotor and a V-rotor are available for optimum adaptation to sample properties.



HOPPER TYPES

The SM 300 can be equipped either with the universal hopper, which is suitable for most samples, or the long-stock hopper which is specially designed for long samples.



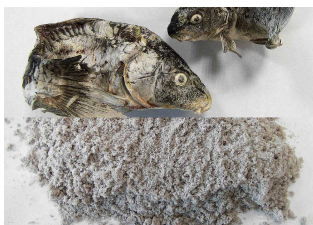
BOTTOM SIEVES

The bottom sieves are made of stainless steel and are available with trapezoid and square holes.

CUTTING MILL SM 300

TYPICAL SAMPLE MATERIALS

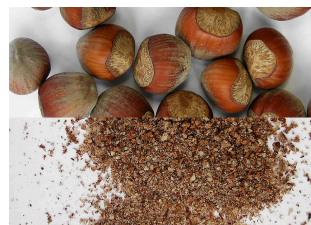
RETSCH cutting mills are suitable for a vast range of applications. Typical materials include PET preforms, aluminium slag, animal feed, bones, cables, cardboard, electronic components, feed pellets, foils, food, leather, lignite, material mixtures, non-ferrous metals, paper, pharmaceutical products, plant materials, plastic toys, plastics, polymers, refuse derived fuels, resins, rubber, spices, straw, textiles, waste, wood, etc.



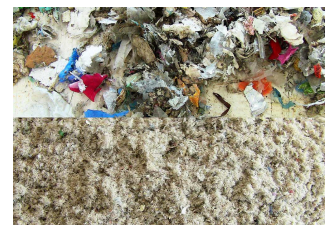
fish



wood



nuts



secondary fuels,
biofuels

APPLICATION EXAMPLES

TORREFACTION & BIO-COAL

Torrefaction is a thermochemical process carried out in the absence of oxygen to cause the partial decomposition of biomass. Water and volatiles are released from the biomass to leave a solid, dry material known as bio-coal. For some applications, bio coal can be used to replace traditional fossil fuels, thus helping to reduce CO₂ emissions.

In this video, both RETSCH cutting mill SM 300 and the CARBOLITE GERO rotating tube furnace TSR have been used as a part of a torrefaction process to create bio-coal fuel.

The Verder Scientific companies provide solutions to support your process every step of the way, from sample preparation and analysis, to heat treatment, and more.



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CUTTING MILL SM 300

TECHNICAL DATA

Applications	size reduction by cutting
Field of application	agriculture, biology, chemistry / plastics, engineering / electronics, environment / recycling, food, medicine / pharmaceuticals
Feed material	soft, medium-hard, tough, elastic, fibrous
Size reduction principle	shearing, cutting
Material feed size*	< 60 x 80 mm
Final fineness*	0.25 - 20 mm
Speed at 50 Hz (60 Hz)	100 - 3000 min ⁻¹
Rotor peripheral speed	4.7 - 20.3 m/s
Rotor diameter	129.5 mm
Types of rotors	parallel section rotor / 6-disc rotor / V-rotor
Types of hoppers	universal, long stock
Material of grinding tools	stainless steel, steel for heavy-metal free grinding, tungsten carbide
Sieve sizes	trapezoid holes 0.25 / 0.50 / 0.75 / 1.00 / 1.50 mm square holes 2.00 / 4.00 / 6.00 / 8.00 / 10.00 / 20.00 mm
Collector systems / capacities	collecting receptacle 5 l / optional: 30 l collecting unit 0.25 / 0.5 l cyclone-suction combination (0.25 l - 30 l)
Drive	3-phase asynchronous motor with frequency converter
Drive power	3 kW with flywheel mass ~ 28.5 kg
Electrical supply data	different voltages
Power connection	1-phase
Engine brake	yes
Protection code	IP 20
W x H x D closed	576 (1080 opened) x 1677 x 750 mm (with base frame and universal hopper)
Net weight	~ 160 kg
Standards	CE

*depending on feed material and instrument configuration/settings

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FUNCTIONAL PRINCIPLE

Size reduction in the Cutting Mill SM 300 takes place by **cutting and shearing forces**. The sample comes into contact with the rotor, and is comminuted between the blades and the stationary double acting cutting bars inserted in the housing.

In the **6-disc rotor**, spirally arranged reversible hard metal plates operate by cutting in sequence. The knives of the **parallel section rotor** carry out comminution with a powerful cutting action. An additional flywheel mass (RES technology) on the drive shaft produces the exceptional performance of the SM 300. Thanks to the **variable speed** from 100 to 3,000 min⁻¹, the SM 300 can be easily adapted to different application requirements



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www.retsch.com/sm300