CUTTING MILL SM 50

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MANY LABORATORIES FACE THESE CHALLENGES:

- Time losses due to complex cleaning and reassembly
- Sample losses caused by hidden residues in hard-to-reach areas
- Limited flexibility when processing various materials
- Risk of contamination that can distort analysis results

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RETSCH TACKLES CHALLENGES:

The new SM 50 revolutionizes laboratory workflows and solves multiple problems at the same time. With its innovative design featuring a removable milling chamber, the SM 50 simplifies cleaning, saving up to 30 % process time. At the same time, the unrivaled powerful benchtop cutting mill with a single phase power plug allows up to 100 % sample recovery* and contamination-free sample preparation.

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CUTTING MILL SM 50

IN CUSTOMER USE

Find out which processes our customers use the SM 50 for.

DEPARTMENT OF CHEMISTRY, BIOCHEMISTRY & PHYSICS
UNIVERSITÉ DU QUÉBEC À TROIS-RIVIÈRES

The research group uses the SM 50 cutting mill to shred plastic waste, biomass, and electronic scrap for the development of new materials for a sustainable world.

“We use the SM 50 cutting mill to process plastic waste, biomass, and electronic scrap for the development of new materials that support a more sustainable future. The SM 50 allows us to quickly and easily pre-grind a wide variety of samples, enabling mechanochemical processes that ultimately lead to the creation of new materials in a circular mindset — a true asset to our scientific work.”

Prof. Thomas Auvray, Department of Chemistry, Biochemistry & Physics, Université du Québec à Trois-Rivières

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A SINGLE SOLUTION FOR EVERYTHING

- The SM 50 is the world's most powerful benchtop cutting mill with a standard one phase power plug. Its 1.5 kW motor drives a large rotor, delivering impressive high-speed cutting power. The max. speed is 4,000 rpm and can be adjusted to suit various applications.

- The EasyInspect hopper operates on a batch-wise feeding system and can process large sample pieces up to 50 mm with ease. The compact powerhouse features an internal cyclone system, ensuring effortless and efficient processing of various materials.

- Sieves with apertures from 0.25 mm to 10 mm allow a final fineness of less than 250 µm, depending on the feed material. A two-step grinding process allows fine particles to be produced by first using a large aperture sieve, followed by a finer one. The design supports high throughput with large sieve areas of 48 mm x 120 mm.

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CUTTING MILL SM 50

EVERYTHING IN VIEW

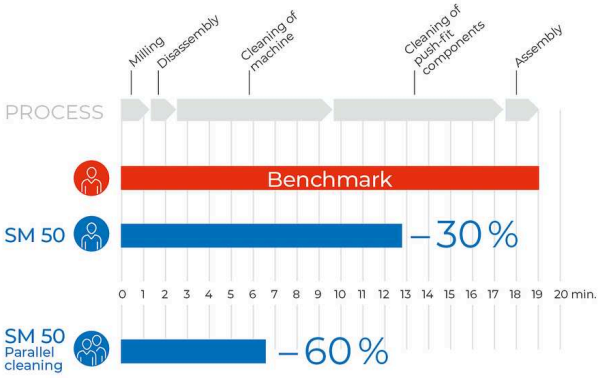
World innovation: When opening the machine door, the front of the hopper swings out to the side, providing full visibility inside. The Total Access Concept ensures easy inspection and cleaning of all sample-contacting components.

CUTTING MILL SM 50

STOP WASTING TIME

Up to 30 % time savings on cleaning with the Total Access Concept and push-fit components.

- The push-fit system allows rotor, sieves, cyclone and milling chamber to be removed without tools.
- For the first time, the milling chamber can be removed as well, making complete cleaning easy and significantly reducing machine downtime.
- EasyInspect hopper fully opens for inspection and cleaning, ensuring quick cleaning.
- No more hard-to-reach pipes or hoses – the SM 50 integrates the cyclone directly into the machine.
- Intuitive operation via touch display and push button, allowing effortless speed adjustments.



Thanks to the Total Access Concept and removable milling chamber process time is significantly reduced in the SM 50

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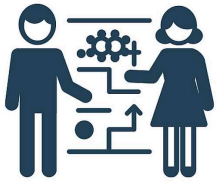
CUTTING MILL SM 50

THREE OPTIONS FOR THE CLEANING OPERATION

Surface cleaning: full access to mill interior, including hopper, with door open for inspection and cleaning with brush, vacuum or compressed air

Intense Cleaning: Comprehensive external cleaning of all grinding tools, including sieve, rotor, cyclone and grinding chamber, all removable without tools using a push-fit system



Parallel cleaning: If a second grinding set is available, samples can be processed directly one after another, thanks to the push-fit grinding tools, including the push-fit milling chamber.

UP TO 100 % SAMPLE RECOVERY*

STOP LOSING MATERIAL

- Compared to milling without cyclone technology, the recovery of sample material is significantly improved. The cyclone technology efficiently transports the sample into the receptacle with no dust release and minimal sample residue left in the mill.
- The integrated cyclone eliminates the need for connecting elements such as pipes or hoses and minimizes distances and surface areas.
- The batchwise feeding of the hopper concept serves as a flow control gate and optimizes the grinding performance and separation efficiency of the cyclone.

Cyclone technology, small distances and minimized surface areas optimize the material flow in the mill and enables up to 100 % sample recovery.*

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STOP MANUAL PRE-CUTTING

The compact EasyInspect hopper allows processing of large sample pieces without pre-cutting.

The exceptionally large grinding chamber allows large samples to be fed, as does the hopper design for batch feeding of samples up to 50 mm. The power and technical design of the SM 50 makes it easy to process a wide range of materials, including:

- Dense monoliths: Dog biscuits, roots, wood pieces
- Tough polymers: Plastic components, rubber compounds, children toys, household items
- Hard & brittle components: electronic parts, LN_2 embrittled samples

animal feed

plastic toys

roots

STOP CONTAMINATION

Maximum safety, even with frequent sample material changes

1. Cleaning on a new level: All grinding tools are easily accessible and can be reliably cleaned of persistent residues. For the first time, the milling chamber can be cleaned separately as well, further preventing cross-contamination from previous milled samples.
2. The push-fit milling chamber is available in various materials, such as stainless steel for abrasion-resistant grinding or aluminum for standard applications as well as for grinding without heavy-metal contamination, allowing a flexible setup in one mill.

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Push-fit milling chamber can be cleaned outside the machine using e.g. water.

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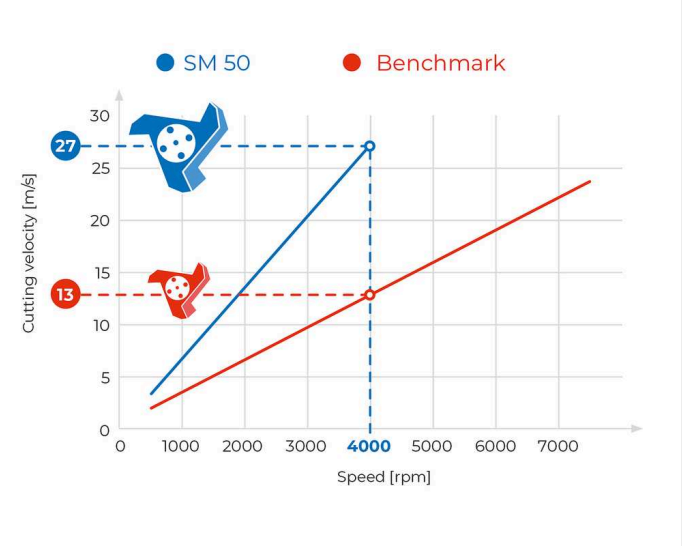
STOP COMPROMISING

The SM 50 expertly merges the compactness of benchtop-mills with the high-capacity performance of floor-standing mills. Unlike other benchtop models, it can grind large monolithic samples, thanks to its expansive hopper and chamber volume. Precision. Power. Performance. Nothing less than exceptional results. And there are many more reasons to choose the new SM 50.

- 1.5 kW drive with variable speed for highly efficient size reduction.
- Maximum speed of 4,000 rpm for exceptional cutting performance
- Large 130 mm rotor diameter and depth of 48 mm for high impact power and fast sample throughput (comparable to large floor-standing cutting mills).
- Superior cutting speed of 27 m/s.
- 3 double acting cutting bars result in 18 cutting events per round and a specific cutting length of 864 mm per round for superior cutting efficiency.
- Optimized design reduces blockages and guarantees smooth operation
- Comprehensive and convenient door opening mechanisms with a pivoting handle.



Large rotor diameter and high speed leads to exceptional high cutting speed for high cutting power.

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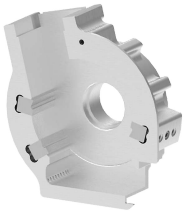
WIDE RANGE OF ACCESSORIES FOR HIGHEST FLEXIBILITY

For the SM 50 a wide range of accessories is available including

- Push-fit milling chamber of three different materials for standard applications, abrasive and corrosion-resistant applications, and for grinding without heavy-metal contamination.
- The integrated cyclone ensures complete sample recovery.
- Gravity chamber for grinding without cyclone, where the receptacle is placed directly underneath the machine so that the material falls in by gravity. Only suitable for applications requiring coarse pre-grinding of non-dusty materials.
- Parallel-section rotor and 3-disc rotor designed for processing materials ranging from soft to hard properties.
- 9 different sieve sizes from 10 mm down to 0.25 mm for standard application or for grinding without heavy-metal contamination.
- Collecting systems are available in 0.25 and 0.5 l capacities for glass collection, as well as a 3 l container.

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INNOVATIVE COMPONENTS AT A GLANCE

The SM 50 ensures up to 100 % sample recovery and contamination-free results through advanced engineering with the EasyInspect hopper, integrated cyclone, and push-fit milling chamber.

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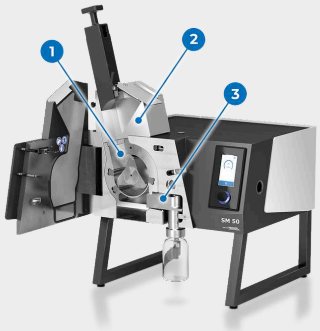
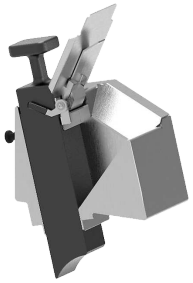


1 | PUSH-FIT MILLING CHAMBER

The removable push-fit milling chamber, available in various materials, prevents contamination and allows quick setup changes. External cleaning ensures complete residue removal, enhancing contamination-free sample preparation.



2 | EASYINSPECT HOPPER

The EasyInspect hopper enables loading of up to 200 ml sample volume or single samples up to 50 mm. It operates on a batch feed basis and features a flow control gate for optimum grinding performance and cyclone efficiency further providing safety protection against injury. A one-hand plunger system controls sample flow, while a flap guides bulky materials into the milling channel.

3 | INTEGRATED CYCLONE

The compact, push-fit cyclone is integrated into the machine housing for easy cleaning and minimal sample loss. Designed with just two components (lid and body), it allows quick removal and simple assembly. A GL55 thread enables attachment of 250 / 500 ml glass bottles or a 3 liter receptacle via adapter.

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CUTTING MILL SM 50

ATTENTION TO DETAIL: SPECIAL FEATURES FOR SUPERIOR PERFORMANCE

Explore the various clever design elements that contribute to the exceptional performance of the SM 50 Cutting Mill

1. Rotor Shaft Release: The rotor shaft can be released using a touch display function for easy cleaning or rotor mounting.
2. Hopper Flap: Assists in pushing fluffy materials into the milling chamber efficiently.
3. Removable Plunger: The plunger can be detached by loosening just one screw for quick access.
4. Inspection Opening: Allows inspection and cleaning of channels that connect to the vacuum cleaner.
5. Touch Display with rotary push button: Provides intuitive control and operation of the machine's functions.
6. Gravity Chamber: Utilizes gravity to assist in material flow for coarse pre-crushing tasks of non-dusty materials.

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Discover the key functions of the SM 50

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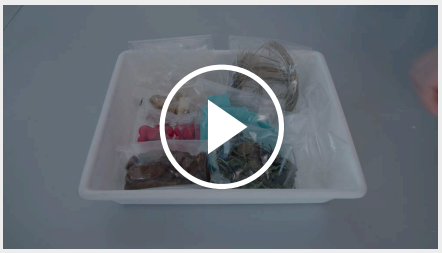
CUTTING MILL SM 50

FASTER AND MORE FLEXIBLE SAMPLE PREPARATION



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Different tasks, different users

In contract laboratories or academic institutions, many people use the same laboratory grinder for a wide variety of samples. It can happen that feathers are ground today and textiles or completely different sample types tomorrow.

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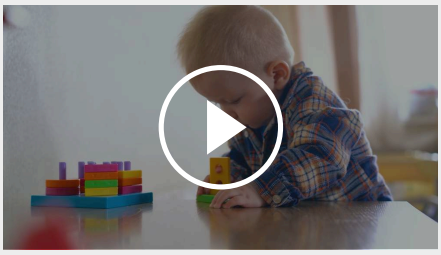
Optimized for different sample tasks in a row

Healthy nutrition is the basis for a happy life. Our food should combine enjoyment and health. To achieve this, it is important that our food is free from harmful substances and that we have precise knowledge of its composition. The quality of agricultural products is tested in environmental and food laboratories.



Click to view video

Grinding of small sample quantities

What do your child's carefree play and your dog's health have to do with the food grinder SM 50? Product safety is essential in many areas, be it children's toys or animal feed. Manufacturers and retailers must ensure that their products do not contain any ingredients that are harmful to health. Take a look!

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APPLICATION EXAMPLES

The high cutting performance of the SM 50 makes it ideal for applications in industries such as agriculture, recycling, food and feed, and pharmaceuticals. The shearing and cutting action, the clever design and the wide range of accessories make it possible to grind soft, medium-hard, tough, elastic and fibrous materials.


roots


preforms


feathers


plastic toys

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FUNCTIONAL PRINCIPLE

The Cutting Mill SM 50 utilizes cutting and shearing forces to achieve size reduction. Samples are fed in batches through the EasyInspect hopper and transported to the milling chamber using a plunger. Within the chamber, the sample is comminuted between rotor blades and stationary double-acting cutting bars. The 3-disc rotor is equipped with spirally arranged reversible hard metal plates that cut sequentially, while the parallel section rotor delivers a robust cutting action for efficient comminution.

Cyclone technology aids in transferring material from the milling chamber to the receptacle, supported by specific air vents that optimize sample discharge. With a variable speed range from 500 to 4,000 rpm, the SM 50 is easily adaptable to a variety of application requirements.

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TECHNICAL DATA

Applications	size reduction by cutting
Field of application	agriculture, chemicals / plastics, construction materials, electronics, environmental / recyling, food / feed, pharma / biotech / medtech, power generation / energy
Feed material	soft, medium-hard, tough, elastic, fibrous
Size reduction principle	shearing, cutting
Material feed size*	50 mm
Final fineness*	0.25 - 10 mm
Speed at 50 Hz (60 Hz)	500 - 4,000 min-1
Rotor peripheral speed	4.3 - 27.1 m/s
Rotor diameter	129.5 mm
Types of rotors	parallel section rotor / 3-disc rotor
Types of hoppers	EasyInspect hopper
Material of grinding tools	stainless steel, steel for heavy-metal free grinding
Sieve sizes	trapezoid holes 0.25 / 0.50 / 0.75 / 1.00 mm square holes 2.00 / 4.00 / 6.00 / 8.00 / 10.00 mm
Collector systems / capacities	collecting glass 0.25 / 0.5 l (not for gravity chamber) and collecting receptacle 3 l
Drive	3-phase asynchronous motor with frequency converter
Drive power	1.5 kW
Electrical supply data	100 V, 110 V, 120 V, 20 A 200-230 V, 10 A
Power connection	1-phase
Engine brake	yes
Protection code	IP 20
W x H x D closed	565 x 750 x 530 (with base frame and hopper)
Net weight	80 kg
Standards	CE

*depending on feed material and instrument configuration/settings

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ORDER DATA

CUTTING MILL SM 50

Cutting Mill SM 50 (please order milling chamber set, rotor, hopper and bottom sieve seperately)

20.720.0001		SM 50	200-230V 50/60Hz, with frequency converter for variable speed
20.720.0003		SM 50	110V 50/60Hz, with frequency converter for variable speed

MILLING CHAMBER SETS SM 50

Consisting of milling chamber, double acting cutting bars, door insert and 500 ml glass bottle / receptacle

22.010.0003	For standard applications: Aluminum milling chamber with stainless steel double acting cutting bars, stainless steel cyclone, stainless steel door insert, and 500 ml glass bottle
22.010.0004	For abrasion and corrosion resistant applications: Stainless steel milling chamber with stainless steel double acting cutting bars, stainless steel cyclone, stainless steel door insert, and 500 ml glass bottle
22.010.0005	For grinding without heavy metal contamination: Aluminum milling chamber with steel 1.1740 double acting cutting bars, stainless steel cyclone, heavy metal free steel door insert, and 500 ml glass bottle
22.010.0006	For grinding without cyclone: Aluminium gravitiy chamber with stainless steel double acting cutting bars, stainless steel door insert, adapter incl. stainless steel 3 l receptacle

ROTORS SM 50

22.608.0041	3-disc rotor made of stainless steel with reversable cutting tips made of tungsten carbide
22.608.0042	3-disc rotor made of steel 1.0570 with reversable cutting tips made of tungsten carbide, for grinding without heavy-metal contamination
22.608.0039	Parallel-section rotor made of stainless steel with cutting plates made of stainless steel
22.608.0040	Parallel-section rotor made of steel 1.0570 with cutting plates made of steel 1.1740, for grinding without heavy-metal contamination

HOPPER SM 50

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22.785.0011		EasyInspect hopper made of stainless steel with PE plunger

BOTTOM SIEVES SM 50

BOTTOM SIEVES MADE OF STAINLESS STEEL 1.4404

03.647.0574		Trapezoid holes, 0.25 mm
03.647.0575		Trapezoid holes, 0.5 mm
03.647.0576		Trapezoid holes, 0.75 mm
03.647.0577		Trapezoid holes, 1.00 mm
03.647.0578		Square holes, 2.00 mm
03.647.0579		Square holes, 4.00 mm
03.647.0580		Square holes, 6.00 mm
03.647.0581		Square holes, 8.00 mm
03.647.0582		Square holes, 10.00 mm
22.647.0001		Bottom sieves made of stainless steel complete set of 9 bottom sieves 0.25 - 10 mm

BOTTOM SIEVES MADE OF STEEL 1.0353 FOR GRINDING WITHOUT HEAVY-METAL CONTAMINATION

03.647.0583	Trapezoid holes, 0.25 mm
03.647.0584	Trapezoid holes, 0.5 mm
03.647.0585	Trapezoid holes, 0.75 mm
03.647.0586	Trapezoid holes, 1.00 mm
03.647.0587	Square holes, 2.00 mm
03.647.0588	Square holes, 4.00 mm
03.647.0589	Square holes, 6.00 mm

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03.647.0590	Square holes, 8.00 mm
03.647.0591	Square holes, 10.00 mm
22.647.0002	Bottom sieves made of steel 1.0353 complete set of 9 bottom sieves 0.25 - 10 mm

ACCESSORIES SM 50

COLLECTING RECEPTACLES

22.523.0001		Sample bottle 250 ml (10 pcs.)
22.523.0002		Sample bottle 500 ml (10 pcs.)
02.107.0493		Lid for collecting receptacle cyclone 3l (only for cyclone)
02.011.0031		Collecting receptacle 3 litres, stainless steel (for grinding with or without cyclone)
02.183.0146		Adapter for collecting receptacle 3l and 5l (only for SM 50 gravity outlet)
02.011.0029		Collecting receptacle 5 litres, stainless steel (only for SM 50 gravity outlet)

MILLING CHAMBERS

22.010.0007	Milling chamber for cyclone made of aluminium with stainless steel double acting cutting bars for standard grinding applications (A)
22.010.0008	Milling chamber for cyclone made of aluminium with steel 1.1740 double acting cutting bars for grinding without heavy metal contamination (A)
22.010.0009	Milling chamber for cyclone made of stainless steel with stainless steel double acting cutting bars for corrosion resistant applications (A)
22.010.0010	Milling chamber for gravity use made of aluminium with stainless steel double acting cutting bars (B)
22.730.0004	Door insert made of heavy metal free steel 1.0570
22.730.0003	Door insert made of stainless steel

STATIONARY CUTTING BARS FOR MILLING CHAMBERS

22.152.0012	Double acting cutting bars made of stainless steel (3 pcs.) for SM 50

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22.152.0013		Double acting cutting bars made of steel 1.1740 (3 pcs.) for grinding without heavy metal contamination
22.608.0043		Adjustment tool for double acting cutting bars

ACCESSORIES FOR ROTORS		
22.908.0001		Reversible cutting tip incl. screws, tungsten carbide, for 3-disc rotor (10 pcs.)
22.151.0010		Cutting plates made of stainless steel for parallel section rotors (3 pcs.)
22.151.0011		Cutting plates made of steel 1.1740 for parallel section rotors (3 pcs.)

CYCLONES		
22.935.0040		Cyclone made of stainless steel
22.748.0005		Industrial vacuum cleaner for mills, 230 V, 50/ 60 Hz (other electrical versions and spare filter bags available upon request)

ADDITIONAL ITEMS		
03.725.0047		PE plunger for EasyInspect hopper
22.225.0002		Replacement extraction tool for rotor
99.200.0045		IQ/OQ Documentation for SM 50

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