Retsch®
a VERDER company

CUTTING MILL

SM 50

retsch.com/products/milling/cutting-mills/sm-50/

SM 50

CUTTING MILL

The new SM 50 revolutionizes laboratory workflows and solves multiple problems at the same time.

Many laboratories face 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, and the risk of contamination that can distort analysis results.

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.

The SM 50 expertly merges the compactness of benchtop mills with the high-capacity performance of floor-standing mills.

* Depending on the sample material and application.

PRECISION. POWER. PERFORMANCE.

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.

SM 50

KEY FEATURES

- Powerful 1.5 kW motor with a standard single phase power plug.
- Up to 30 % time savings on cleaning with the Total Access Concept.
- Push-fit milling chamber, rotor, sieve and cyclone for tool-free removal.
- Integrated cyclone for efficient sample recovery.
- EasyInspect hopper for sample pieces up to 50 mm.
- Variable speed up to 4,000 rpm.

SM 50

A SINGLE SOLUTION FOR EVERYTHING

The SM 50 is the world's most powerful benchtop cutting mill with a standard one phase power plug. 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.

CUTTING MILL SM 50

EVERYTHING IN VIEW

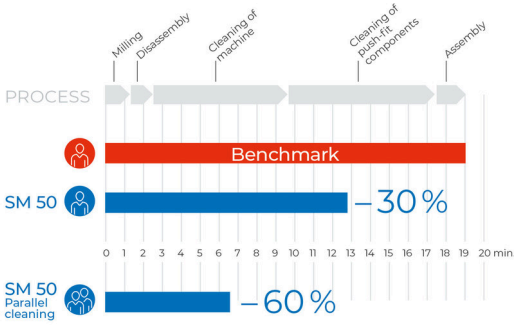
World innovation: When opening the machine door, the front of the hopper swings out to the side, providing full visibility inside. The Total Access Concept ensures easy inspection and cleaning of all sample-contacting components.

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.
- 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.
- 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.



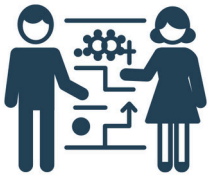
Thanks to the Total Access Concept and removable milling chamber process time is significantly reduced.

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: external cleaning of sieve, rotor, cyclone and grinding chamber, removable without tools using a push-fit system.



Parallel cleaning: with a second grinding set, samples can be processed directly one after another using push-fit grinding tools.

UP TO 100 % SAMPLE RECOVERY

STOP LOSING MATERIAL

- Compared to milling without cyclone technology, the recovery of sample material is significantly improved. The cyclone 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.
- Batchwise feeding serves as a flow control gate and optimizes grinding performance and cyclone separation efficiency.

Cyclone technology optimizes material flow and enables up to 100 % sample recovery.*

CUTTING MILL SM 50

STOP MANUAL PRE-CUTTING

The compact EasyInspect hopper and exceptionally large grinding chamber allow large samples up to 50 mm to be fed without pre-cutting. The SM 50 processes a wide range of materials:

- **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

SM 50

STOP CONTAMINATION

Maximum safety, even with frequent sample material changes. 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.

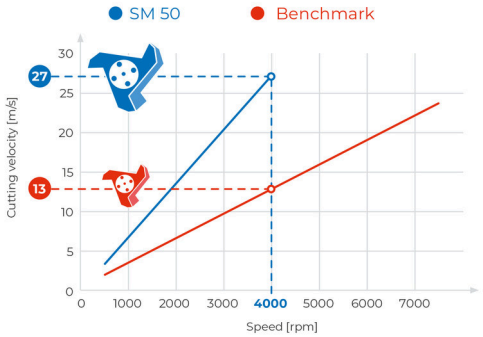
The push-fit milling chamber is available in stainless steel for abrasion-resistant grinding or aluminum for standard applications and grinding without heavy-metal contamination. It can be cleaned outside the machine using e.g. water.

SM 50

STOP COMPROMISING

The SM 50 merges the compactness of benchtop mills with the high-capacity performance of floor-standing mills. Its expansive hopper and chamber can grind large monolithic samples.

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



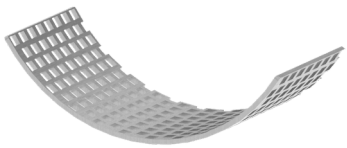
Large rotor diameter and high speed lead to high cutting power.

CUTTING MILL SM 50

WIDE RANGE OF ACCESSORIES

Push-fit milling chambers, rotors, sieves and collecting systems give the SM 50 flexibility for standard applications, abrasion- and corrosion-resistant applications, and grinding without heavy-metal contamination.

Parallel-section and 3-disc rotors



Nine sieve sizes, 0.25 to 10 mm

Integrated cyclone and collecting systems

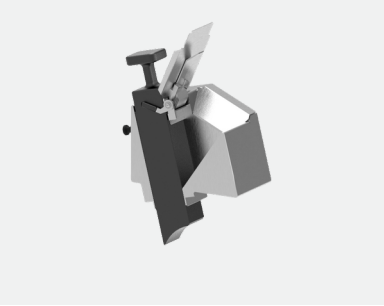
CUTTING MILL SM 50

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.

1 | PUSH-FIT MILLING CHAMBER

The removable chamber, available in various materials, prevents contamination and allows quick setup changes. External cleaning ensures complete residue removal.



2 | EASYINSPECT HOPPER

Loads up to 200 ml sample volume or single samples up to 50 mm. Batch feeding and a flow control gate optimize grinding performance and cyclone efficiency. A one-hand plunger controls sample flow.

3 | INTEGRATED CYCLONE

The compact push-fit cyclone is integrated into the machine housing for easy cleaning and minimal sample loss. A GL55 thread attaches 250 / 500 ml glass bottles or a 3 liter receptacle via adapter.

CUTTING MILL SM 50

ATTENTION TO DETAIL

Special features for superior performance:

- **Rotor shaft release:** touch display function for easy cleaning or rotor mounting.
- **Hopper flap:** helps push fluffy materials into the milling chamber.
- **Removable plunger:** detaches by loosening just one screw.
- **Inspection opening:** allows cleaning of channels that connect to the vacuum cleaner.
- **Touch display with rotary push button:** intuitive control.
- **Gravity chamber:** for coarse pre-crushing of non-dusty materials.

CUTTING MILL SM 50

FASTER AND MORE FLEXIBLE PREPARATION

Different tasks, different users: In contract laboratories or academic institutions, many people use the same laboratory grinder for a wide variety of samples. Feathers may be ground today and textiles or different samples tomorrow.

Optimized for different sample tasks in a row: The quality of agricultural products is tested in environmental and food laboratories. Precise knowledge of food composition and freedom from harmful substances are important.

Grinding of small sample quantities: Product safety is essential for children's toys and animal feed. Manufacturers and retailers must ensure that their products do not contain ingredients harmful to health.

CUTTING MILL SM 50

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

CUTTING MILL SM 50

IN CUSTOMER USE

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.

“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

CUTTING MILL SM 50

TECHNICAL DATA

Applications	size reduction by cutting
Field of application	agriculture, chemicals / plastics, electronics, environmental / recyling, food / feed, pharma / biotech / medtech, construction materials, power generation / energy
Feed material	soft, medium-hard, tough, elastic, fibrous
Size reduction principle	shearing, cutting
Max. 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

SM 50

ORDERING INFORMATION

CUTTING MILL SM 50

Please order milling chamber set, rotor, hopper and bottom sieve separately.

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 gravity 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 reversible cutting tips made of tungsten carbide
22.608.0042	3-disc rotor made of steel 1.0570 with reversible 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

22.785.0011	EasyInspect hopper made of stainless steel with PE plunger

ORDERING INFORMATION

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
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

ORDERING INFORMATION

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
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

ORDERING INFORMATION

ACCESSORIES SM 50

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

SM 50

FURTHER INFORMATION

Product data sheet SM 50, flyer SM 50 and the RETSCH General Catalogue are available on the product page.

PRODUCT PAGE → retsch.com/products/milling/cutting-mills/sm-50/

ORDER DATA → retsch.com/products/milling/cutting-mills/sm-50/order-data/

SM 50

CONTACT US →

retsch.com/contact-services/contact-form/

REQUEST A QUOTE →

retsch.com/products/milling/cutting-mills/sm-50/order-data/

retsch.com/products/milling/cutting-mills/sm-50/

© RETSCH – retsch.com / Content may be subject to modifications or corrections