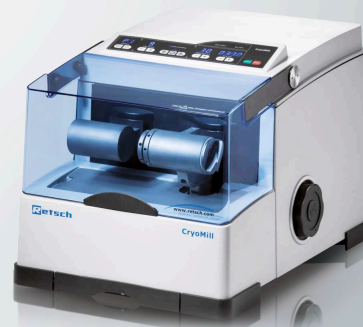


## CRYOMILL



The CryoMill is tailored for **cryogenic grinding**. The grinding jar is continually cooled with liquid nitrogen from the **integrated cooling system** before and during the grinding process.

Thus the sample is embrittled and volatile components are preserved. The liquid nitrogen circulates through the system and is continually replenished from an **Autofill system** in the exact amount which is required to **keep the temperature at -196 °C**.

Powerful impact ball milling results in a **perfect grinding efficiency**. The Autofill system **avoids direct contact with LN<sub>2</sub>** and makes cryogenic grinding **very safe**. Its versatility (cryogenic, wet and dry grinding at room temperature) makes the CryoMill the **ideal grinder** for quantities up to 20 ml.

You may also be interested in the High Energy Ball Mill Emax, an entirely new type of mill for high energy input. The unique combination of high friction and impact results in extremely fine particles within the shortest amount of time.

## APPLICATION EXAMPLES

animal feed, bones, chemical products, food, hair, oil seeds, paper, plant materials, plastics, sewage sludge, soils, tablets, textiles, tissue, waste samples, wood, wool, ...

## PRODUCT ADVANTAGES

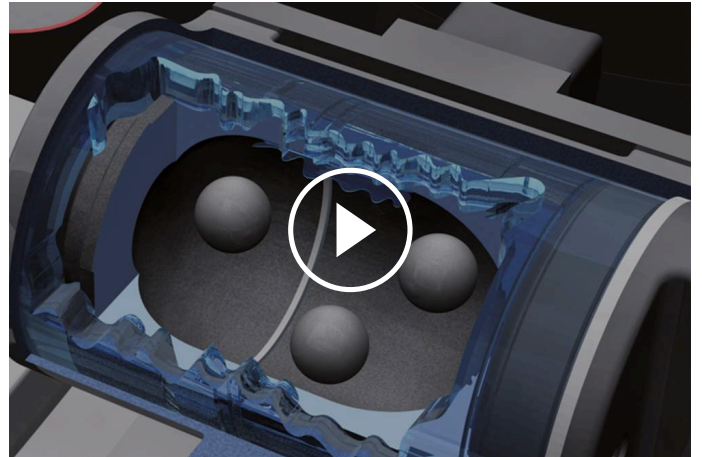
- | powerful cryogenic grinding by impact and friction, up to 30 Hz
- | 3 different grinding modes (cryogenic, dry or wet at ambient temperature)
- | closed LN<sub>2</sub>-system (autofill) for enhanced safety, avoids any contact of the user with LN<sub>2</sub>
- | screw-top grinding jars for convenient, leak-proof operation
- | wide range of accessories including various LN<sub>2</sub> feeding systems, jar and ball sizes, adapter racks, materials
- | low LN<sub>2</sub>-consumption
- | clearly structured user interface, memory for 9 SOPs
- | programmable cooling and grinding cycles (10 s to 99 min)
- | ceramic jar available

## FEATURES

<b>Applications</b>	size reduction, mixing, homogenization, cell disruption
<b>Field of application</b>	agriculture, biology, chemistry / plastics, construction materials, engineering / electronics, environment / recycling, food, geology / metallurgy, glass / ceramics, medicine / pharmaceuticals
<b>Feed material</b>	hard, medium-hard, soft, brittle, elastic, fibrous
<b>Size reduction principle</b>	impact, friction
<b>Material feed size*</b>	<= 8 mm
<b>Final fineness*</b>	~ 5 µm
<b>Batch size / feed quantity*</b>	max. 20 ml
<b>No. of grinding stations</b>	1
<b>Setting of vibrational frequency</b>	digital, 5 - 30 Hz (300 - 1800 min <sup>-1</sup> )
<b>Typical mean grinding time</b>	10 min / 4 min (cooling / grinding)
<b>Dry grinding</b>	yes
<b>Wet grinding</b>	yes
<b>Cryogenic grinding</b>	yes
<b>Cell disruption with reaction vials</b>	yes
<b>Self-centering clamping device</b>	yes
<b>Type of grinding jars</b>	screw top design
<b>Material of grinding tools</b>	hardened steel, stainless steel, zirconium oxide, PTFE
<b>Grinding jar sizes</b>	5 ml / 10ml / 25 ml / 35 ml / 50 ml
<b>Autofill</b>	50 l
<b>Setting of grinding time</b>	digital, 30 s - 99 min
<b>Storable SOPs</b>	9
<b>Electrical supply data</b>	100-240 V, 50/60 Hz
<b>Power connection</b>	1-phase
<b>Protection code</b>	IP 30
<b>Power consumption</b>	260 W
<b>W x H x D closed</b>	395 x 373 x 577 mm (D: 710 mm with exhaust tube)
<b>Net weight</b>	~ 45 kg
<b>Standards</b>	CE

## FUNCTION PRINCIPLE

The grinding jar of the CryoMill performs radial oscillations in a horizontal position. The inertia of the grinding balls causes them to impact with high energy on the sample material at the rounded ends of the grinding jar and pulverize it. The grinding jar is continually cooled with liquid nitrogen from the integrated cooling system before and during the grinding process.



[Click to view video](#)

[www.retsch.com/cryomill](http://www.retsch.com/cryomill)

## ORDER DATA

### CRYOMILL

**(please order Autofill with LN2 container and safety valve, grinding jars and balls separately)**

20.749.0001



CryoMill, 100–240 V, 50/60 Hz

### GRINDING JARS CRYOMILL

#### HARDENED STEEL

01.462.0300  5 ml, to be used with adapter 02.706.0304

01.462.0330  25 ml

01.462.0329  35 ml

01.462.0328  50 ml

#### STAINLESS STEEL

01.462.0290  5 ml, to be used with adapter 02.706.0304

01.462.0331  10 ml

01.462.0334  25 ml

01.462.0333  35 ml

01.462.0332  50 ml

#### ZIRCONIUM OXIDE

01.462.0336



25 ml

PTFE

01.462.0335



25 ml

## ACCESSORIES CRYOMILL

02.480.0002

Autofill with LN2 container and safety valve, 50 litres

05.871.0001



Connection tube, incl. safety valve (for LN2 supply provided by customer)

02.706.0304



Adapter for use of 2/4 grinding jars, 5 ml

02.706.0303



Adapter for use of 2/4/6 reaction vials, 2 ml

22.749.0001



Safe-lock reaction vials 2 ml, 1000 pcs.

99.200.0016



IQ/OQ Documentation for CryoMill

03.111.0262



Gasket for grinding jar 5 ml, 1 piece

03.111.0313



Gasket for grinding jar 10 ml, 1 piece

03.111.0291



Gasket for grinding jar 25 ml, hardened steel or stainless steel, 1 piece

03.111.0296

Gasket for grinding jar 25 ml, zirconium oxide, 1 piece

03.111.0290



Gasket for grinding jar 35 ml, 1 piece

03.111.0289

Gasket for grinding jar 50 ml, 1 piece

## GRINDING BALLS

HARDENED STEEL

05.368.0029  5 mm Ø

05.368.0030  7 mm Ø

05.368.0059  10 mm Ø

05.368.0032  12 mm Ø

05.368.0108  15 mm Ø

STAINLESS STEEL

05.368.0034  5 mm Ø

05.368.0035  7 mm Ø

05.368.0063  10 mm Ø

05.368.0037  12 mm Ø


05.368.0109  15 mm Ø

05.368.0062  20 mm Ø

05.368.0105  25 mm Ø

ZIRCONIUM OXIDE

05.368.0094  10 mm Ø

05.368.0096  12 mm Ø

05.368.0113



15 mm Ø

PTFE WITH STEEL CORE

05.368.0045



10 mm Ø

05.368.0046



12 mm Ø

05.368.0114



15 mm Ø

05.368.0047



20 mm Ø