



1 *Open cryogenic screw conveyor.*

CRYOGENIC GRINDING

CONVENTIONAL AND INNOVATIVE

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

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Fraunhofer UMSICHT has 15 years of experience in the cryogenic grinding of a large number of different materials. Mastering several upstream and subsequent processes in the field of cryogenic grinding, we can offer you full service in designing your customized powder product. Furthermore, we can accompany the development of your product from the first feasibility test to pilot production. If desired, our experts will give you advice in planning your own grinding facility.

Our experienced team handles all products with due care in order to deliver products of high quality and is also committed to finding solutions for special tasks. We are the ideal partner for grinding your material.

Keywords

- LN₂- cryogenic grinding
- Feasibility tests
- Pilot production
- Customized design of powders
- Process development

Industrial sectors

- Plastics processing industry
- Chemical industry
- Recycling industry
- Food industry



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2 Counter rotating pin disc mill.

3 Powder and pellets.

Our Offer

- Processing of temperature-sensitive, visco-elastic and fibrous materials as well as minerals up to Mohs hardness 4
- Precrushing by granulator or cutting mill
- Cryogenic grinding of different materials such as thermoplastics, thermosets, elastomers, and natural materials
- Use of counter-rotating pin disc mill or ultra turbo mill under inert conditions
- Classification of powders
- Customized powder design
- Support during development of powders from first feasibility studies to sample production
- Support in planning of grinding facilities

Applications

- Polymeric coating and sintering powders
- Varnish and compound additives
- Micronized waxes
- Recycling of crosslinked materials
- etc.

Auxiliary services

- Analytics
- Coating trials
- Selective laser sintering trials
- etc.

Get it all from one source

COMPOUNDING

Equipment in lab and industrial scale



PRECRUSHING

Granulator, cutting mill



GRINDING

Equipment in lab and industrial scale



SCREENING

Air jet sieve, oscillating sieve, tumbling sieve



ANALYZING

Particle size distribution, flowability, particle morphology



PROCESSING

Coating, recycling, selective laser sintering

Technical specifications

Batch sizes	10 kg up to 2 t
Throughput	Up to 200 kg/h
Temperature range (cooling)	Ambient temperature down to -196 °C
Temperature range (grinding)	+20 °C down to -75 °C
Refrigeration technology	LN ₂ -cooler (500 kg LN ₂ /h) 6 t-tank
Grinding tools	<ul style="list-style-type: none"> • Counter-rotating pin discs with smooth or riffled pins • Rotor-stator systems
Relative peripheral speed	<ul style="list-style-type: none"> • 38 m/s up to 223 m/s • 41 m/s up to 125 m/s
Airflow demand	Approx. 500 m ³ /h
Reachable particle sizes	D50 < 100 µm possible
Classification	Sieves between 40 µm and 900 µm available