

Product specification

Laboratory Fragmentator selFrag-Lab



 **selFrag**

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Application

selfFrag-Lab is intended for the selective fragmentation of composite materials, mineralogical and geological samples in the one kilogram range. It offers the possibility of selectively liberating target specimens while minimizing the by-production of fines.

Equipment

selfFrag-Lab is designed to achieve simplicity of operation. It comes as a stand-alone piece of equipment designed for easy installation in a typical mineral laboratory environment. The equipment consists of a HV power supply, a HV pulse generator, a process chamber, a portable process vessel and a lifting table for easy loading and unloading of the process vessel. The process chamber, a confined space containing the working electrode is enveloped by an outer shell specially designed to guard against sound and electromagnetic emissions. To keep the unit compact, the HV components are insulated with oil and gas and walled with a steel shielding. To ensure safe operation, the HV parts of the equipment are protected by safety interlocks.

Mode of operation

The HV pulse generator is continuously charged by the HV power supply. When the predetermined voltage is reached, the energy of the HV pulse generator is discharged from the HV working electrode through the solid sample to the grounded bottom of the process vessel. This charging and discharging cycle is repeated at a given frequency until the pre-selected number of pulses (discharges) has been reached. The operation occurs in batch mode.

Handling

The portable process vessel is first charged with the desired amount of sample material and then filled with water. Next, it is placed onto the lifting table in the loading section. Then the interlocking safety door is closed. After setting the experimental parameters on a touch panel, the operator can start the automated sequence: The lifting table moves the process vessel into position inside the process chamber and the fragmentation process starts. Typically the fragmentation is completed after 10 to 120 seconds. Next, the lifting table lowers the process vessel to the loading section, the safety interlocks are released and the door can be opened to retrieve the vessel with the fragmented sample.

Scope of delivery

- 1 x Laboratory Fragmentator selfFrag-Lab
- 1 x External control computer
- 1 x Standard process vessel with collector
- 1 x Bottom plate
- 1 x Perforated bottom plate (with d=2mm holes)
- 1 x Process vessel handle

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Technical specifications

Design:

Self-contained, compact, semi-automated device, designed for installation on level, solid ground in interiors.

Outer dimensions:

Max. LxWxH	200 x 80 x 200	cm
Clear ceiling height	250	cm
Operating weight	max. 1700	kg

Capacity:

Max. sample volume	1	dm ³
Min. sample volume	0.25	dm ³
Max. size of single piece	Ø 10 x 4	cm

Noise protection:

Casing to prevent air-borne noise.

Average working noise level 95 dB(A) (ear protection is recommended).

EMC:

Casing acts as closed Faraday cage.

Operating conditions:

Working temperature	12 - 32	°C
Ambient conditions when not operating	4 - 40	°C

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Control, user interface:

PLC with graphic touch panel.

User information:

- Process status
- Diagnostic information.

Settings:

- | | |
|------------------------------|-------------------|
| - Max. voltage | 150 - 200 kV |
| - Number of pulses per batch | 1 to 5'000 pulses |
| - Pulse frequency | 2 - 5 Hz |
| - Electrode gap | 10 - 50 mm |

Connections:a) Required utilities

Gas loop:

- | | |
|--|-------|
| - Technical grade, dry Nitrogen (N ₂) | 5 bar |
| - Nitrogen consumption:
Expl.: One compressed cylinder 50 liters @ 200 bar
lasts for approx. 100 cold starts | |

Electrical energy:

- | | |
|------------------------|--------------|
| - Connection (3-phase) | 400 V |
| - Power consumption | max. 14 kVA |
| - Standby mode | max. 0.5 kVA |

b) Discharges

Water:

- Drain for process water overflow

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