

## Task:

**Application field:** Building Materials

**Material:** 1. Cement clinker; 2. Slag; 3. Mud sediment

**Feed size:** 3-7 mm

**Feed quantity:** 30 g (+ 3 tablets "Spectromelt", for each sample)

**Material specification(s):** hard brittle, dry

**Customer requirement(s):** < 100 µm; for X-ray fluorescence analysis

**Subsequent analysis:** X-ray Fluorescence Analysis

## Solution:

**Selected instrument(s):** Planetary Ball Mill PM 100

**Configuration(s):** Grinding jar "comfort" tungsten carbide 125 ml;  
7 x grinding ball tungsten carbide ø 20 mm

**Parameter(s):** Revolution speed 450 rpm

**Time:** 5 min. (sample 1 and 2); 2 min. (sample 3)

**Achieved result(s):**

1. Cement clinker:	100 % < 100 µm
2. Slag:	99 % < 100 µm
3. Mud-sediment:	93 % < 100 µm

**Remark(s):** To avoid the agglomeration of the powders, 3 tablets "Spectromelt" were added before grinding. Due to its two large initial particle size the mud sediment (sample 3) had to be pre-crushed manually with a hammer.

**Recommendation:** For the grinding of hard brittle clinker and slag samples the Planetary Ball Mill PM 100 is suitable according to the above mentioned conditions.

Report No.: 11409  
 Date: 01.06.2006  
 Contact: DE

**Pictures of the sample**



**Fig. 1:** Cement clinker sample before and after grinding in PM 100 for 5 min.



**Fig. 2:** Slag sample before and after grinding in PM 100 for 5 min.



**Fig. 3:** Mud sediment sample before and after manual pre-crushing with a hammer



**Fig. 4:** Mud sediment sample after grinding in PM 100 for 5 min.

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**Task:****Application field:** Environment / Recycling**Material:** Soil**Feed size:** 2 mm**Feed quantity:** 30 g**Material specification(s):** dry**Customer requirements(s):** 212 µm**Subsequent analysis:** XRF - X-ray Fluorescence Analysis  
ICP-MS - Mass Spectroscopy  
Heavy metals**Solution****Selected Instrument(s):** Planetary Ball Mill PM 100**Configuration(s) Item nos.:** 1 x PM 100, 230 V, 50/60 Hz  
1 x Grinding jar "comfort", tungsten carbide, 80 ml  
5 x Grinding ball, tungsten carbide, 20 mm ø

Please note: Other electrical versions of the instrument(s) are available with different item numbers.

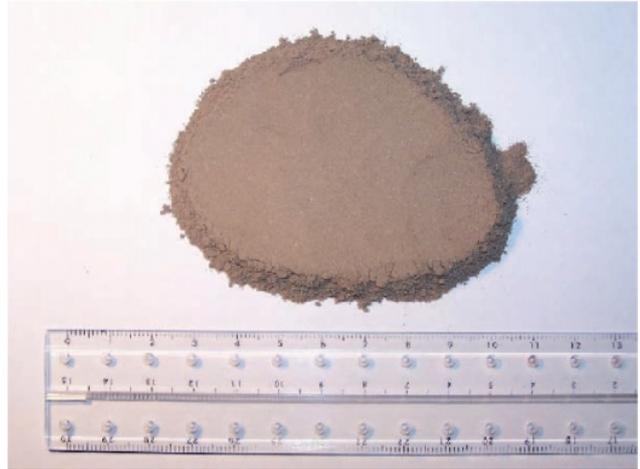
**Parameter(s):** Revolution speed: 200 rpm**Time:** 1 min**Achieved result(s):** d90: < 212 µm**Remark(s):** The sample was pre-crushed with a Jaw Crusher BB 200.**Recommendation:** The Planetary Ball Mill PM 100 is suitable to grind the sample material under the above mentioned conditions.

**Report No.:** 17047  
**Date:** 14.03.2016  
**Contact:** MLU

**Pictures of the sample:**



**Picture 1: Pre-crushed sample**



**Picture 2: Sample after grinding process with PM 100**

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The application report is based solely on the processing of the available sample material in the indicated amount. No legal claims shall be derived from this test report.

Subject to technical modification and errors.

**Task:****Application field:** Agriculture**Material:** Soil samples, with high content of clay and minerals**Feed size:** 0-10 mm (different to the samples)**Feed quantity:** 120 g**Material specification(s):** dry**Customer requirement(s):** 100 - 150 ml appx. < 50 µm**Subsequent analysis:** ICP Inductive Coupling Plasma**Solution:****Selected instrument(s):** PM 100 CM Planetary Ball Mill**Configuration(s):** Grinding jar 250 ml, Sintered alumina (Al<sub>2</sub>O<sub>3</sub>);  
5 grinding balls, Sintered alumina, 30 mm Ø**Parameter(s):** Revolution speed 450 rpm**Time:** 10 min. (per sample)**Achieved result(s):** 98 % < 50 µm  
see samples**Remark(s):** Moistly samples must be dried before grinding.  
To avoid sticking effects of the material during grinding, it is necessary to add 5 - 8 drops of methanol into the jar.**Recommendation:** For fine grinding of dry soil samples, the Planetary Ball Mill PM 100 CM is suitable under the above mentioned conditions

**Report No.:** 10411  
**Date:** 07.03.2003  
**Contact:** HP

**Pictures of the sample**



**Fig. 1: Soil with clay**



**Fig. 2: Soil with minerals**

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