Task:

Application field: Construction Materials

Material: 1) Plastic foil; 2) Mixture of paper, fibres, glass, organic parts, plastic

Feed size: 1-60 mm

Feed quantity: Sample 1; ZM 200: 20 ml  
Sample 1; SM 300: 30 ml  
Sample 2; SM 300: 100 ml

Material specification(s): fibrous, moist

Customer requirement(s): < 0.5 mm

Subsequent analysis: Net Calorific Value

Solution:

Selected instrument(s): Cutting Mill SM 300  
Ultra Centrifugal Mill ZM 200

Configuration(s):  
**SM 300:**  
Parallel section rotor SM 300, stainless steel;  
Bottom sieve trapezoid holes 1.5 mm, stainless steel  
Ring-type filter for collecting receptacle 5 litres;  
Standard hopper;  
**ZM 200:**  
Push-fit rotor, 6 teeth, stainless steel;  
Ring sieve trapezoid holes 2 mm, stainless steel;  
Ring sieve trapezoid holes 0.5 mm, stainless steel;  
Cyclone ZM 200, with 3 litres collector

Parameter(s):  
**SM 300:** Revolution speed 3000 rpm  
**ZM 200:** Revolution speed 18000 rpm

Time: 1 – 2 Min. for each test
**Achieved result(s):**

Predominantly < 1 mm

**Remark(s):**

| Sample 1: SM 300: | Grinding of sample 1 in the SM 300 with a bottom sieve 1.5 mm.  
Material staying in the grinding chamber has to be expected.  
Grinding larger quantities will probably not increase the residue.  
Sample 1: ZM 200: | Grinding of sample 1 in two steps in the ZM 200.  
Pre-grinding with the ring sieve 2 mm (after pre-embrittlement in liquid nitrogen).  
Fine grinding with the ring sieve 0.5 mm (after pre-embrittlement in liquid nitrogen).  
Due to the high frictional forces pre-embrittlement of the sample in liquid nitrogen or dry ice is recommended. By using a cyclone the liquid nitrogen can be fed together with the sample in order to keep the sample and the grinding tools cool.  
Sample 2: SM 300: | Drying of sample 2 in our Fluid Bed Dryer TG 200 in order to improve the breaking properties of the material.  
Grinding in SM 300 with the bottom sieve 1.5 mm.  
Using a smaller sieve will increase the residue of material in the grinding chamber. |

**Recommendation:**

For grinding secondary fuels (waste) the Cutting Mill SM 300 and the Ultra-Centrifugal Mill ZM 200 are suitable under the above mentioned conditions. Grinding in two steps is recommended (pre-grinding in SM 300, fine grinding in ZM 200).
Pictures of the sample

**Fig. 1:** Original sample 1, foil
**Fig. 2:** Sample 1 after grinding in SM 300, sieve 1.5mm

**Fig. 3:** Residues of sample 1 in SM 300, sieve 1.5mm
**Fig. 4:** Sample 1 after pre-grinding in ZM 200, sieve 2mm
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.
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