

plastic - PP EPDM, PS, PP, PA

Protocol number: M130306
Industry: Plastics / textiles
Feed Size: ca 10 mm
Characteristics: 4 verschiedene Proben; kein ABS - eine heißt "PP EPDM"
Desired Fineness: < 2 mm
Quantity: 200 g
Recommendation: A Variable Speed Rotor Mill PULVERISETTE 14 as desired in not capable grinding the thermoplastic sample without a previous embrittlement. We recommend using a cutting mill like PULVERISETTE 15 or PULVERISETTE 19 for comminution.

Result 1

Variable-Speed Rotor Mill PULVERISETTE 14

rotor speed: 20.000 rpm

impact rotor with 8 ribs made of stainless steel
+ sieve ring 2,0 mm trapezoidal perforation



Material attributes: sample: **PP-EPDM**

Feed quantity: 2 g

Feed Size: < 10 mm

Grinding time: 30 s

Final fineness: smokes and melts

Comments: Grinding sound indicated that the sample use to stick between rotor and sieve ring.

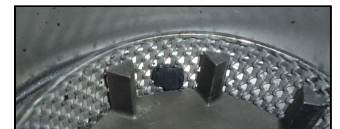
After a low sample amount has been fed, sample got hot and started to produce smoke by friction between rotor and sieve ring. The grinding process has been aborted.

The sample is not brittle enough to get properly ground by the impact on the rotors ribs. Mainly the sample gets ground by shearing forces. Because the sample uses to be thermoplastic, sample started to melt.

A grinding might be possible when sample will be previously embrittled in liquid nitrogen.

We would recommend using a cutting mill for a comminution of such samples.

Pictures: Only a few particles have been fed before sample stated to melt. A grinding of higher amounts of sample is not possible this way.



Result 2

Cutting Mill PULVERISETTE 15

sieve insert with 2,0 mm trapezoidal perforation



Material attributes: sample: **PP-EPDM**

Feed quantity: 50 g

Feed Size: < 10 mm

Grinding time: 2 min

Final fineness: < 2 mm

Comments: By using a Cutting Mill PULVERISETTE 15, sample did not start melting inside the grinding chamber.

After 50 seconds, the complete sample amount has been fed. At this time, already 38 grams of output have been achieved. After a total of 75 seconds, output rose to 46 gram. When 2 minutes of grinding has been reached, a total output of 47 g has been found in the collecting vessel of the machine.

The remaining 3 grams of sample use to be attached by electrostatic charge to the grinding chamber. A grinding of higher amounts of sample should be possible.

We are guessing that 200 grams of sample will be ground in < 5 minutes.

Result 3

Cutting Mill PULVERISETTE 15

sieve insert with 2,0 mm trapezoidal perforation



Material attributes: sample: **PA 6**

Feed quantity: 50 g

Feed Size: < 10 mm

Grinding time: 30 s

Final fineness: < 2 mm

Comments: The second sample can be ground rapidly. This sample does not seem to be such electrostatic charged like sample PP EPDM from result 1.

Within 30 seconds, the complete sample got fed and ground. Grinding sound stopped immediately. Only a very small amount of sample has been found afterwards, lying loose on top of the sieve insert.

Cleaning can be performed rapidly by vacuuming with a soft brush.

Result 4

Cutting Mill PULVERISETTE 15

sieve insert with 2,0 mm trapezoidal perforation



Material attributes: sample: **PP**

Feed quantity: 100 g

Feed Size: < 10 mm

Grinding time: 2:30 min

Final fineness: < 2 mm

Comments: Sample PP might have almost equal properties like sample PP EPDM. A higher amount of sample remains inside the grinding chamber by electrostatic charge.

100 grams of sample got fed within 90 seconds. After a total grinding time of 2 minutes, already 87 g of ground sample could be found in the collecting vessel. After 2 ½ minutes, the output rose to 94 grams. About 6 grams of sample remained loose inside the grinding chamber and could be removed easily by vacuuming with a soft brush.

Result 5

Cutting Mill PULVERISETTE 15

sieve insert with 2,0 mm trapezoidal perforation



Material attributes: sample: **PS**

Feed quantity: 100 g

Feed Size: < 10 mm

Grinding time: 2 min

Final fineness: < 2 mm

Comments: 100 grams of the most whitish last sample has been ground within 2 minutes.

Feeding has been done within 1:15 seconds. Afterwards, already 95 grams of sample got found in the collecting vessel. Within 2 minutes, the output rose to 97 gram. Subsequently, residues could be removed by vacuuming with a soft brush.

We like to mention that also Universal Cutting Mill PULVERISETTE 19 will be capable for rapid comminution of such samples too. The Universal Cutting Mill PULVERISETTE 19 use to have big advantages when many different samples should be ground daily. For cleaning and operation, the machine use to be optimized. Cutting rotors and sieve cassettes can slide into the grinding chamber without using tools, quick release fasteners will get rapid access to the grinding chamber. Also the many different rotor types and further accessories are available for PULVERISETTE 19 (e.g. active cyclone separator, V-cutting rotor and knives made of hardmetal tungsten carbide,...).

Contact to our Applications Laboratory: Leos Benes · Phone: 0049 67 84 70 122 · benes@fritsch.de