**Task:**

**Application field:** Environment

**Material:** Electronic cards of the automotive industry

**Feed size:** 0-150 mm (pieces of about 40 x 150 mm)

**Material specification(s):** abrasive, hard

**Feed quantity:** 100 g (per sample)

**Customer requirement(s):** < 100 µm;

**Subsequent analysis:** X-ray Fluorescence Analysis (XRF): Investigation of Pb, Cd, Hg, Cr, Ni

**Solution:**

**Selected instrument(s):** SM 2000 Heavy-Duty Cutting Mill

**ZM 200 Ultra Centrifugal Mill**

**Configuration(s):**

SM 2000:
- standard hopper;
- bottom sieve SM 2000 of stainless steel with square holes of 4 mm;

ZM 200:
- push-fit rotor of stainless steel with 12 teeth;
- ring sieves ZM with Conidur holes of 0.5 / 0.25 mm.

**Parameter(s):** Revolution speeds:

SM 2000: 50 rpm

ZM 200: 18000 rpm

**Time:** 5 min. (for pre-grinding per sample)

**Achieved result(s):** < 100 µm

(sufficient for the subsequent analysis)

**Remark(s):** The preparation can be carried out according to following working steps:

1. Separation of the steel and iron parts.
2. Pre-cutting of the electronic cards in SM 2000 with bottom sieve of 4 mm.
Recommendation: For the preparation of electronic cards for the heavy metal analysis we recommend to follow the above mentioned work flow. Due to the abrasive character of composite materials a certain wear of the grinding tools should be taken into account.

Pictures of the sample

Fig. 1: Electronic boards before grinding
Fig. 2: Electronic boards after pre-cutting in SM 2000; bottom sieve 4 mm square holes
Fig. 3: Electronic boards after fine grinding in ZM 200; ring sieve 0.5 mm Conidur holes
Fig. 4: Electronic boards after fine grinding in ZM 200; ring sieve 0.25 mm Conidur holes