

## Your cell phone turns into dust

### Optimal sample preparation for the RoHS/ WEEE Analysis

Considering the characteristics of materials used for the construction of a cell phone the whole spectrum of hard-tough to hard-brittle up to soft, tough-elastic materials is found. Mentioned should be metals, ceramic parts and the most various plastics.

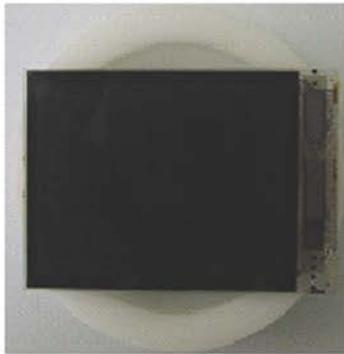
Whereas the hard-brittle materials are easily ground with impact energy, the comminution of tough-elastic materials is only achieved with cutting force. Tough-elastic materials may be embrittled with liquid nitrogen and then ground with impact force.

#### Various tests with FRITSCH Mills

The **Power Cutting Mill PULVERISETTE 19I/50-700 rpm** was chosen as the first level of comminution of a complete cell phone. Once reduced to 10 mm the **Vibrating Cup Mill PULVERISETTE 9** was supposed to complete the rest. This experiment was unsuccessful. Therefore, the PULVERISETTE 25 with a 4 mm sieve was used again. For the next level, the **Universal Cutting Mill PULVERISETTE 19** was chosen. With cutting tools made of hard metal tungsten carbide the remainder was comminuted down to 1 mm. An attempt to achieve even a finer powder by exchanging the sieve was unsuccessful. That's why as the last level of comminution the **Variable Speed Rotor Mill PULVERISETTE 14 classic line** with a 0.5 mm sieve was utilized. Good experiences of the comminution of single electronic components were made with the **Vibratory Micro Mill PULVERISETTE 0**, embrittled with liquid nitrogen in the cyro-box.

Vorher

Nachher



Handy-LCD-Glasscheibe



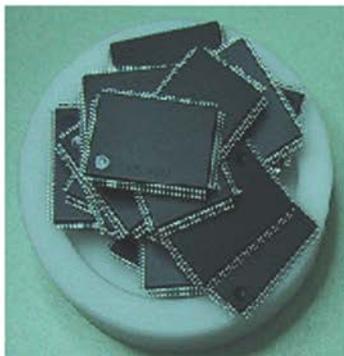
Zerkleinerung bei Raumtemperatur



Handy-Tastatur



Zerkleinerung durch Versprödung unter Gefrierbedingungen



Elektronik-Chip



Zerkleinerung bei Raumtemperatur

Fig. 1: Various steps of comminution

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