



## Tar paper, Roofing-Bitumen

### ...most people are only familiar with these materials in order to seal roofs

But what happens with this material when a building is torn down? In the landfills it is considered a source of irritation. Based on its high energy content it can be mixed in and burned along with derived fuels. Predestined are here for example cement works. The burning process can only be guided though if the energy content of all fuels is known. So the task in the laboratory is to determine the fuel value. But other parameters are to be analysed too, for example chloride or the heavy metals. Here a representative and homogenous sample is needed, from which a weighted-sample in the lower gram areas is possible.

#### Embrittlement is a must

For the sample preparation a heterogeneous sample must therefore be comminuted. The tar paper is already very tough at room temperature and consequently, for the comminution, the material must be embrittled.

Pre-crushed, embrittled and at least mixed in the ratio of two parts of dry ice to one part roofing bitumen, the material can be comminuted without problems down to below 2 mm with the **Universal Cutting Mill PULVERISETTE 19**; in combination with the sample exhauster with Cyclone separator.



Fig. 1: Comminuted tar paper

The success of the grinding is clearly illustrated with the photo. The Cyclone creates a current of the mill feed and thereby speeds up the immediate discharge of the comminuted sample. The dry-ice furthermore cools the interior of the cutting mill. Since the material is inside the grinding chamber only for a brief moment, it's not warmed up and can therefore not stick to the grinding tools. The design of the mill aids the fast and good cleaning and sets standards here: The quick-lock-system of the housing and the cutting tools as well as the sieve cassette can be removed without tools.

The second photo shows on the right side pre-crushed down to 3 cm pieces of material, which were mixed with dry ice and on the left side of the photo, the ground material. Thereby the fibrous constituent parts were specifically separated and included in the photo.



Fig. 2: Sample material pre-crushed



Roofing building materials often contain supporting textures. Are these organics fibres - like in the example here – so the bitumen and the fibre are present as a blend after the comminution. With small weighted samples, possibly the homogeneity of the sample is not sufficient. Two solutions are suitable here: Both parts are analysed separately and then combined mathematically.

Or the fibres are severed off, again mixed with dry ice and with the aid of a finer sieve, additionally comminuted. Then from both phases a homogenous average sample can be obtained.

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