

## Crushing concrete coarsely and fine

### FRITSCH Jaw Crushers are up to the task

Concrete is a complex material, which its characteristics due to its composition and as a result of the systematic addition of additives can be adjusted very differentiated. However, this results in the demand to monitor this composition for two reasons: in order to ensure the desired useful properties and also to ensure the quality of the mixture.

#### The task

A typical *task* is the crushing of concrete drilling cores or demolition waste. The greatest challenge for the sampling is to draw a representative sample from the demolition waste shown in the picture, which can be processed in laboratory conditions. The amount of a single sample can be up to 50 kg. Often concrete drilling cores are to be evaluated too. Place, time and conditions of the sampling taking are much more precise here. This avoids mistakes during sampling. Are the concrete drilling cores too large, they are pre-crushed with a compactor or manually with a lump-hammer. Now the task determines the following course of the sample preparation.



Fig. 1: Demolition waste

#### One step crushing

We recommend for the pre-comminution of the concrete the **Jaw Crusher PULVERISETTE 1 classic line**. The in the photo shown pre-crushed drilling core, was crushed in one step with the jaw crusher down to the possible final fineness.



Fig. 2: Pre-crushed drilling core

As a matter of principal, for the eluate, the grain size should be used which corresponds with the additional utilization. Since chunks of concrete like in the photo (on the next page) cannot be analysed though, one has to assume approximately 10 mm for assessments, for other tests analytically fine samples are to be used. According to the commercial waste ordinances, a fineness of below 0.2 mm is to be assumed. Is a material with a grain size of 10 mm needed, in the first run a large amount of material is broken up. The distance of the crushing jaws is therefore adjusted accordingly wide. For the determination of the eluable materials, the required shares are sampled.

For the analysis it shall be referred to DIN 38414, part 4 of the so called DEV S4-procedure. The remainder of the material is again processed with the smallest gap width of the jaw crusher. The grains are below 3 mm now. The example shows besides the base material both the resulting grains. It is greywacke, which for example is used as rubble or trains.

The second step of the fine pre-crushing ensures that from the heterogeneous base material now a representative mixed sample of at least 50 g according to the commercial waste ordinances is obtained.



Fig. 3: The example shows besides the base material both the resulting grains.

**Preferred for this task are the following instruments**

We recommend for this task the **Rotary Cone Sample Divider LABORETTE 27** combined with the **Vibratory Feeder LABORETTE 24**. As a sample amount 100 g is assumed. The somewhat larger sample accommodates the representativeness and is the optimum amount for the fine comminution for obtaining the analytical fineness of the sample in the next mill.

Preferred for this task are the:

- ▲ **Vibrating Cup Mill PULVERISETTE 9**
- ▲ **Planetary Mill PULVERISETTE 5 classic line**
- ▲ **Planetary Mono Mill PULVERISETTE 6 classic line**

If the Jaw Crusher is used for samples for heavy metal analysis, the use of fixed and movable crushing jaws made of hardmetal tungsten carbide is recommended.

**Interesting links:**

Association of German Cement Works: [www.vdz-online.de/en/](http://www.vdz-online.de/en/)

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