
Procedures for proper sampling and delivery of the material

It is necessary to follow the sampling procedures in order to ensure the accuracy of the calculated values and ensure high significance of the analyses conducted.

The results of the analyses have to be referred to the sample as received by the Laboratory ABC, which has not performed or directly supervised the sampling operations. It is in the interest of those who commission the analysis make sure that the sample is significantly representative of the entire mass of material.

In the case where the request is performed according to a standard, it is necessary to strictly adhere to the provisions of the existing norms on biomass for energy purposes or commissioning technicians of the Laboratory ABC the execution of this operation.

The following guidelines are intended to provide a quick overview of the operating modes for the collection, identification and sample shipment and do not replace in any way as specified in the reference standard (UNI EN 14778: 2011).

Collect a minimum of:

- about 55-60 litres of wood chip (indicatively the contents of a postal box 50x50x25 cm)
- 15 kg of pellets
- 25-30 kg of briquettes or wood chops.

The collection should be performed with suitable tools, able to collect approximately a sub-sample at a time with a volume equal to approximately one litre.

The number of sub-samples to be collected depends on the mass of the pile and the degree of homogeneity of the material that is distinguished into three groups: homogeneous fine, coarse homogeneous and heterogeneous. An increasing number of sub-samples with the increasing mass of the pile and its heterogeneity have to be collected.

It is always to prevent the collection of sub-samples at the base of piles or at their top. It is also to prevent the collection of sub-samples only on the external surface of the piles when an inhomogeneous particle size distribution inside the pile is expected.

As an example, the following sampling cases in relation to the most common forms of storage and handling of biofuels are presented:

- sampling from stationary stockpiles: the sampler shall visually divide the heap into three horizontal layers, and take a number of sub-samples from each layer in proportion to the volume contained in each layer. The positions around the circumference of the heap from which the increments are taken shall be equally-spaced
- sampling from containers, lorries and wagons: sampling can be carried out on the unloaded material (see above) or on the material during the unloading (see below)
- sampling of falling material: a sampling box is passed through the stream of falling material so that it cuts the whole cross section of the falling stream

- sampling of material running of conveyor belts: a sampling frame is placed on top of the material on the stopped conveyor belt and forced to the bottom. The sampling frame should have a width equal to at least 2.5 times the average size of the particles. All the material contained within the sampling frame shall be taken as a sub-sample.

The samples must be rapidly closed in waterproof opaque bags or containers. If it is necessary to determine the water content, the container has to be pressed and closed immediately after sampling to remove as much air as possible (be careful not to puncture or tear the container) and shipped promptly to the headquarters of Laboratory ABC.

In case the shipment should be delayed respect to the collection (not more than a week) it is recommended to preserve the container or bag to a temperature below 5° C.

If, instead, the determination of the moisture content is not required, the sample should be placed in breathable containers allowing a pre-drying of the material and minimizing the possibility of fermentation of the sample.

For greater accuracy in the determination of the water content is recommended to collect an amount of about 300-400 g of wet material and seal it in an airtight container filled to the full.

On the container or on a label fixed to the outside should be reported indelibly the following information:

- Place and date of sampling
- Name of the sampler
- Sample mass at source (if possible)
- Identification name of the sample
- Sequential number of the sample (in the case where more than one sample is transferred to the Laboratory ABC)

It is necessary to fill in completely the **Certificate of sampling and analysis order** and attach it to the parcel. Its proper compilation will reduce errors to a minimum on the analyses and will allow receiving all the information necessary to the laboratory activities

The samples should be sent to:

Laboratorio Analisi BioCombustibili (Laboratory ABC)
c/o **Front Office Dept. TESAF (1st building, 2nd floor)**
Viale dell'Università 16
35020 Legnaro PD
Italy

For any further information and clarification the staff of the Laboratory ABC is available at the telephone number +39 49 827 2767 or at biofuel.tesaf@unipd.it