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Second edition
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Abrasive grains — Sampling and splitting

Grains abrasifs — Échantillonnage et division

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 5, *Grinding wheels and abrasives*.

This second edition cancels and replaces the first edition (ISO 9138:1993), which has been technically revised with the following changes:

— many more detailed specifications are included in the entire document;

— requirements for four different types of sampling are specified;

— a detailed description of the splitter is included;

— whole sampling an splitting procedure described in much more detail for big-bags and paper-bags;

— a detailed specification of sampling preparation included.

Abrasive grains — Sampling and splitting

1 Scope

This International Standard specifies the apparatus and the method for sampling and splitting of a lot of abrasive grains, to be used in the comparative testing of uniformly produced abrasive grains.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6344-1, *Coated abrasives — Grain size analysis — Part 1: Grain size distribution test*

ISO 8486-1, *Bonded abrasives — Determination and designation of grain size distribution — Part 1: Macrogrits F4 to F220*

ISO 8486-2, *Bonded abrasives — Determination and designation of grain size distribution — Part 2: Microgrits F230 to F2000*

3 Apparatus

3.1 Sampling thief

3.1.1 General

The sampling thieves described in 3.1.2, 3.1.3, 3.1.4, or 3.1.5 shall be used.

The sampling thief shall be made from seamless steel tubing of inside diameter of 25 mm to 30 mm and a wall thickness of 1,5 mm to 3,0 mm. The length is depending of the packaging, but shall be 90 % at an angle of 45° of the packaging from top to bottom. The tube shall be pointed at one end. Holes shall be bored in a straight line.

Length, diameter, and hole or slot size shall fit to the packaging type and size in order to ensure representative samples.

The hole or slot sizes are depending on the grain size (see ISO 6344-1, ISO 8486-1, and ISO 8486-2) and shall be according to Table 1.

Table 1 — Diameter of holes or width of slot(s) of sampling thieves

Grain size	Diameter of holes or width of slot(s) in mm
F4 to F10	25
F12 to F800 or P12 to P2500	10
F1000 to F2000	20

3.1.2 Sampling thief type 1 (with holes)

The sampling thief type 1 with holes shall be used for sampling from “drums” or big-bags. The sampling thief type 1 shall have a “T” handle or an equivalent handle at the other end.

Figure 1 shows an example for a sampling thief type 1.

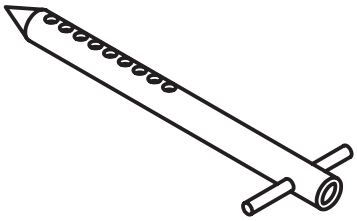

Figure 1 — Example for a sampling thief type 1

3.1.3 Sampling thief type 2 (with one slot)

The sampling thief type 2 (with one slot) is recommended when sampling from small bags. Length of sampling device is typically 500 mm, and slot is 10 mm in width and 250 mm in length.

Figure 2 shows an example for a sampling thief type 2.

Figure 2 — Example for a sampling thief type 2

3.1.4 Sampling thief type 3 (with three to five slots)

The sampling thief type 3 (with three to five slots) is recommended when sampling from small bags. Length of sampling device is typically 500 mm. This equipment is provided with three slots of 10 mm in width and 80 mm in length, 50 mm between slots.

Figure 3 shows an example for a sampling thief type 3.

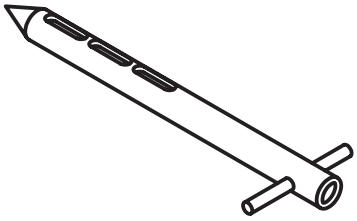

Figure 3 — Example for a sampling thief type 3

3.1.5 Sampling thief type 4 (motor driven)

Several types of motor-driven sampling thieves are commercially available. They shall be used for compacted powders. This is to ensure representative sampling from the compacted bag. Compacted powders occur when the material has been stored for a long time or powder has been transported.

Figure 4 shows an example for a sampling thief type 4.

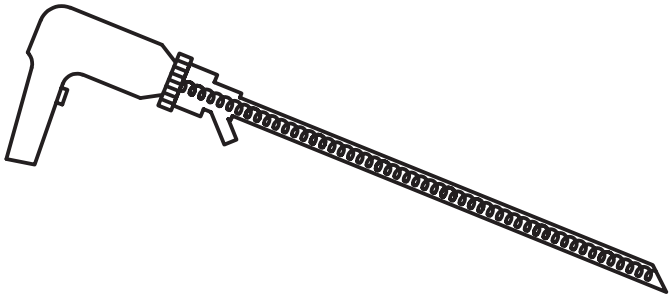

Figure 4 — Example for a sampling thief type 4

3.2 Splitter

A riffle-type sampler (commonly known as a Jones sampler) is generally used (see Figure 5). It consists of a hopper made of a series of slots that are constructed to discharge alternately in opposite directions.

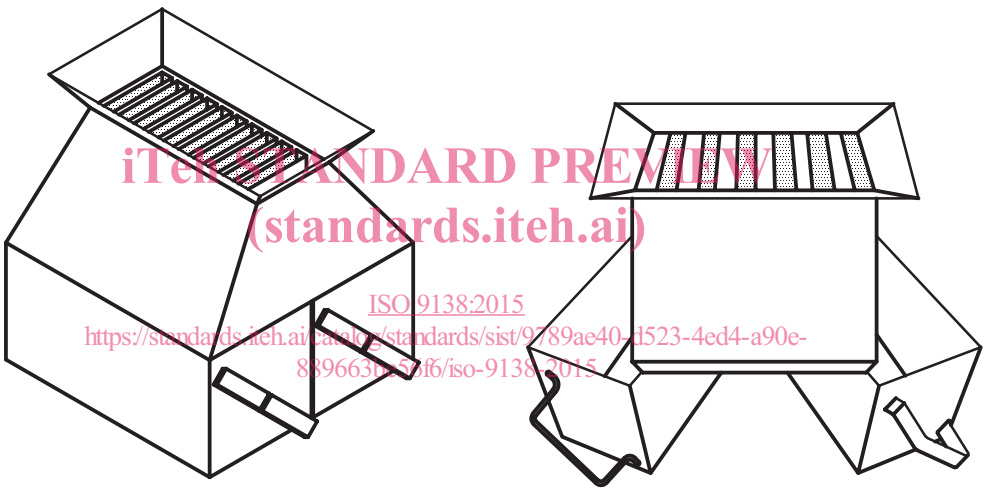

Figure 5 — Example of a riffle-type sampler

The sizes of the slots and the splitter are depending on the grain size and shall be according to Table 2.

Table 2 — Sample splitter external dimensions (capacity) to suit relevant sample sizes

Grain size	Sample mass in kg	Slot width in mm
F4 to F220 or P12 to P220	≤10	10
	>10	20
F230 to F2500 or P240 to P3000	<1	7

Alternatively to the use of a splitter, samples may be quartered manually. see 4.4.

4 Procedure

4.1 General

During transportation and storage, segregation might occur. Samples shall be a representative homogeneous mixture of the grain size under investigation. To obtain a representative sample, the sample thief shall be completely filled during sampling. See also 4.5.

4.2 Sampling from big-bags or "drums"

4.2.1 With sampling thief, type 1

Press the sampling thief at an angle of 60° (see Figure 6) into the packaging unit with the holes or slot(s) facing downwards. Press down until the sample thief has reached 90 % of the packaging diagonal. Then twist the tube through 180° and allow it to fill. Withdraw the tube, taking care not to rotate the thief, and remove the sample. Take at least two samples from each big-bag. In case of a defect, repeat sampling from a different part of the same big-bag or, if available, from a different big-bag.

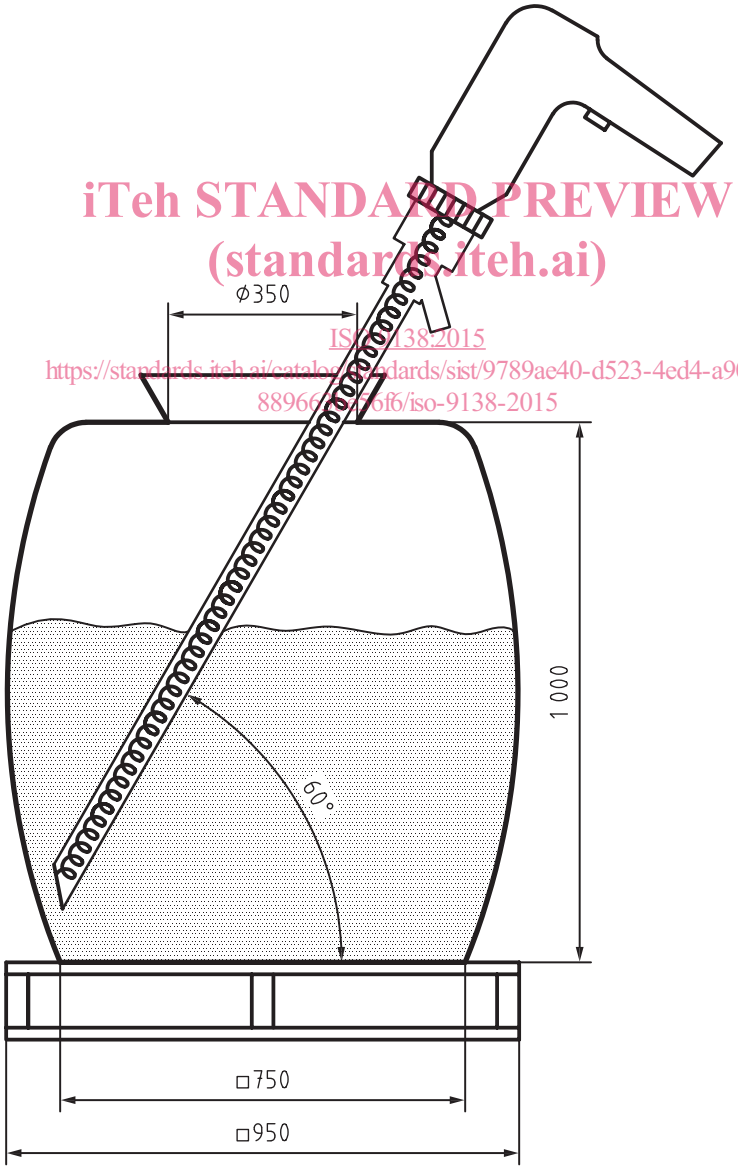

Figure 6 — Sampling big-bags

4.2.2 With sampling thief (motor driven), type 4

Insert the sampling thief at an angle of 60° (see Figure 6) to horizontal into the container at uniform movement. Make sure that the sampling thief reaches the bottom of the container. The motor should be stopped while the sampling thief is redrawn from the container before it is emptied.

Repeat the procedure until a representative sample is obtained.

4.3 Sampling from paper-bags

Sampling thieves type 2 or type 3 shall only be used in horizontal orientation. Press into the packaging with holes or slot(s) facing downwards. Press in until the sample thief has reached 90 % of the packaging horizontal length. Then twist the tube through 180° and allow it to fill. Withdraw the tube, taking care not to rotate the thief, and remove the sample. Repeat this procedure from all sides of the pallet to ensure representative sample. For procedure, see Figure 7.

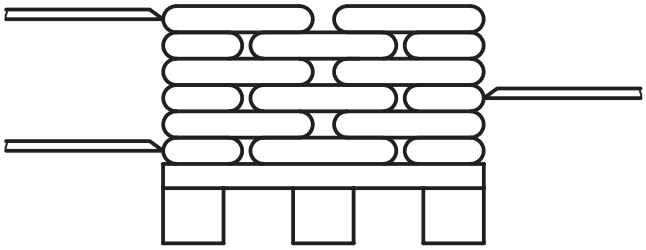

Figure 7 — Sampling paper-bags

4.4 Sample preparation

4.4.1 General

Suitable sample size shall be achieved by one of the two methods described in 4.4.2 and 4.4.3.

4.4.2 Splitting by using a splitter

Pass the sample through the splitter (according to 3.2), dividing it into two equal portions. Take one of these portions and by passing it through the splitter, divide it into two portions again. Repeat this procedure until a sample amount is obtained; this is 25 % larger than the amount required for testing.

4.4.3 Splitting by quartering manually

A sample can be quartered manually by mixing two of the opposite portions and reducing them again to quarters. Continue until a sample amount is obtained; this is 25 % larger than the amount finally required for testing.

4.5 Segregation

Sometimes segregation can be a problem. For materials, which are strongly segregating during transportation, above mentioned sampling procedure might not lead to a representative sample in all cases. Other methods have to be applied or developed (e.g. again homogenization followed by sampling or increase number of samples taken according to raster process, which have to be defined.)