

Fillers, pigments and starch

Sampling

0 Introduction

This SCAN-test Method replaces SCAN-P 45:82. The revised Method includes the sampling of starch.

The Method presents some general guidelines for obtaining representative samples from large consignments of fillers, pigments or starches. The described sampling procedure must, however, be adapted to local conditions. It is not suitable when taking samples intended for microbiological examination.

If possible, the sample should be taken when the material is in motion. It is then preferable to take the sample in several portions, covering the whole stream of material, rather than to divert a side-stream to a sample vessel.

Note – Fractionation of starches, fillers and pigments according to particle size may result from their handling at the mill. When a heap is formed, the fine particles tend to remain in the centre, while the coarse particles slip down the sides. Digging in the heap will produce the opposite effect, the coarse particles tending to concentrate in the centre. As a result of shaking and jolting – for instance, during transport – the coarse particles will concentrate near the surface.

On a conveyer belt various kinds of fractionation may occur. If the material is fed to the centre of the belt, the fine particles will remain there, whereas the coarse ones will tend to flow towards the edges. When the belt moves they will also concentrate near the surface.

1 Scope

This SCAN-test Method describes procedures for sampling fillers, pigments and starches used in the manufacture of paper and board. The Method is applicable to sampling for the purpose of consignment quality control.

2 Definitions

2.1 *Lot* – A definite quantity of some commodity manufactured or produced under conditions which are presumed uniform.

2.2 *Consignment* – A quantity of some commodity delivered at one time. The consignment may consist of one or more lots or parts of lots.

2.3 *Sample* – One or more items taken from a population and intended to provide information on the population and possibly to serve as a basis for a decision on the population or on the process which had produced it.

2.4 *Spot sample* – A quantity of material taken at one time from a larger body of material.

2.5 *Gross sample* – An aggregation of spot samples.

Note – Definitions 2.1 to 2.5 are taken from ISO 3534, Statistics – Vocabulary and symbols. However, ISO uses the term "increment" instead of "spot sample" (2.4 and 2.5).



Figure 2. Sampling bottle for slurries.

3.4 *Sample containers*, at least as many as the number of gross samples (see sections 5.1 to 5.5), of glass or plastic, about 1 litre in volume, with tightly fitting lids.

3.5 *Protective clothing and respiration filter* to provide protection against the inhalation of dust.

4 Inspection of the consignment

Before sampling, judge whether the consignment consists of different lots. If the material is packed in barrels or sacks, this can be deduced from production numbers or dates. The stock kept in storehouses or in piles can consist of several lots of different colours and particle sizes. Sample each such lot as though it were a separate consignment.

During the inspection, record the general appearance of the consignment, whether any packages are defective, whether the consignment is contaminated, and any other relevant details.

5 Procedure

If a measure of the variation within the consignment shall be obtained, keep all the spot samples separate. Otherwise, combine them to form one gross sample. Keep the samples in air-tight containers, marked for identification.

5.1 *Sampling from a conveyer belt*, for example when unloading from a ship or a railway wagon. Use the scoop (3.1.1) and, if possible, move it through the whole stream of material, *Figure 4*. Otherwise, take spot samples from both the middle and the margins of the stream. From a railway wagon take at least 5 such spot

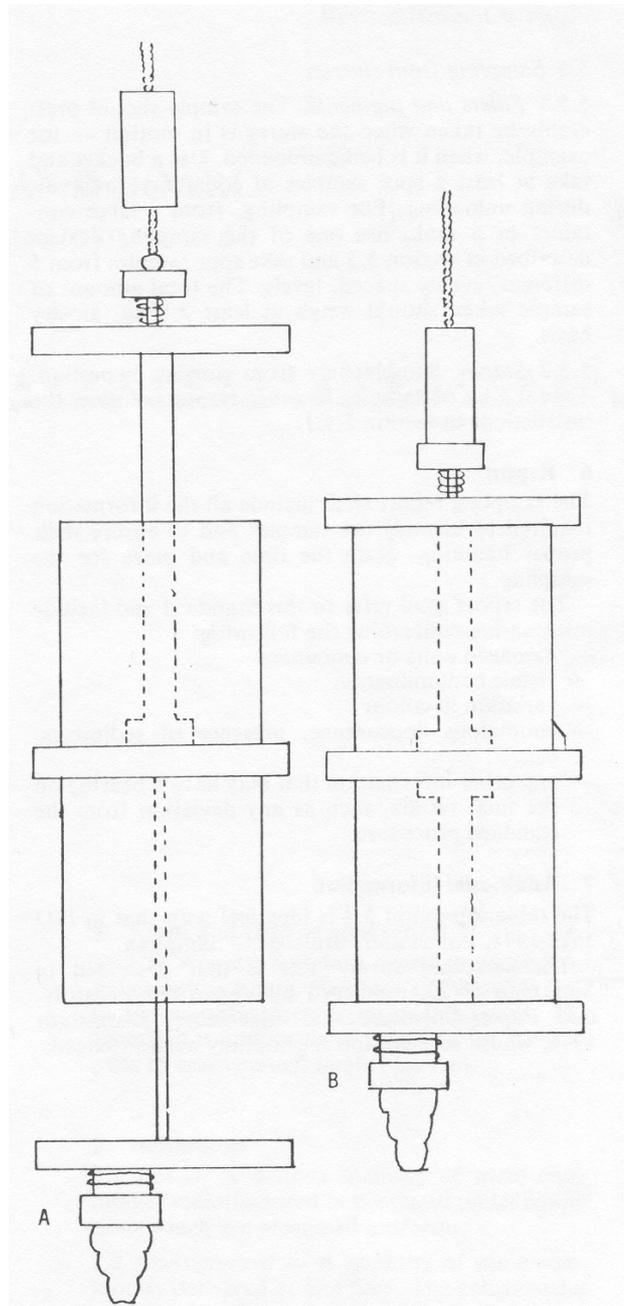


Figure 3 Sampling device for deep containers and tanks. The sampler is closed by allowing a weight to slide down along the suspending line. The load hits the sampler and releases the hatches that keep it open.

samples, and from a ship's hold at least 10. Each spot sample should contain at least 0,5 kg of sample.

5.2 *Sampling from a lorry, a ship's hold, etc.*, including containers to be emptied with the aid of compressed air. Use the sampling spear (3.2.1) and take at least 5 spot samples from different parts of the load. From a ship's hold, take at least 10 spot samples. The total amount taken should be at least 2,5 kg.

5.3 *Sampling from a pile or a large container.*

Divide the lot to be sampled into 4, 5 or 6 parts. Use the sampling spear (3.2.1) and insert it as far as possible into the material. From each part of the lot take spot samples. The total amount collected should be at least 2,5 kg.

5.4 *Sampling from barrels or sacks.* Select at random the appropriate number of units to be sampled, as indicated in the table:

Total number of units	Number of units to be sampled
2 – 10	2
11 – 20	3
21 – 35	4
36 – 50	5
51 – 70	6
71 – 90	7
91 – 125	8
126 – 160	9
161 – 200	10

If the consignment consists of more than 200 units, sample one additional unit for each group of 50 additional units.

Open all the units so selected and use the scoop (3.1.1) to take one representative spot sample from each unit. If the sacks are very large, use the sampling spear (3.2.1). Take at least 0,5 kg from each unit; the total amount collected shall be at least 2,5 kg.

Note – Gross samples of starch should preferably be subdivided so that only 0,5 kg will be sent to the laboratory for analysis.

5.5 *Sampling from slurries*

5.5.1 *Fillers and pigments.* The sample should preferably be taken when the slurry is in motion – for example, when it is being unloaded. Use a bucket (3.1.1) and take at least 5 spot samples at equal time intervals during unloading. For sampling, from a large container or a tank, use one of the sampling devices described in section 3.3 and take spot samples from 5 different, evenly spaced, levels. The total amount of sample taken should weigh at least 2,5 kg, air-dry basis.

5.5.2 *Starch.* Sample only from slurries in motion. Take 0,5 kg of sample. In other respects, follow the instructions in section 5.5.1.

6 **Report**

The sampling report shall include all the information required to identify the samples and to ensure their proper handling. State the time and place for the sampling.

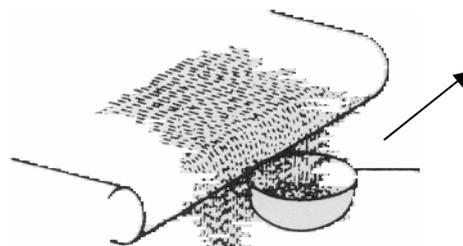


Figure 4. Sampling from conveyer belts.

The report shall refer to this SCAN-test Method and include information concerning the following:

- (a) damaged units or containers;
- (b) visible contamination;
- (c) variation in colour;
- (d) anomalous appearance, presence of sediments, etc.;
- (e) any other information that may have a bearing on the final results, such as any deviation from the procedure described in this Method.

7 **Additional information**

The table in section 5.4 is identical with that in ISO 1512:1974, *Paints and varnishes – Sampling*.

The sampling spear (3.2.1) is that described in Merkblatt V /27, published by Verein der Zellstoff- und Papier-Chemiker und Ingenieure, Darmstadt 1975, whose cooperation is gratefully acknowledged.

SCAN-test Methods are issued and recommended by KCL, PFI and STFI-Packforsk for the pulp, paper and board industries in Finland, Norway and Sweden. Distribution: Sekretariat, Scandinavian Pulp, Paper and Board Testing Committee, Box 5604, SE-114 86 Stockholm, Sweden.