International Standard 1886

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Textile glass — Method of sampling applicable to batches

Verre textile — Méthode d'échantillonnage applicable à des lots

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1886 was developed by Technical Committee ISO/TC 61, *Plastics*, and was circulated to the member bodies in January 1978.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Romania
Austria	Hungary	South Africa, Rep. of
Belgium	India	Spain
Canada	Israel	Sweden
China	Italy	Switzerland
Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Netherlands	USA
Finland	New Zealand	USSR
France	Poland	

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 1886-1975).

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Textile glass — Method of sampling applicable to batches

1 Scope and field of application

This International Standard specifies a method of sampling applicable to batches of textile glass products (continuous filaments, staple fibres, rovings, mats, fabrics, chopped and milled fibres, etc.).

According to the type of inspection, either by variables (measurements) or by attributes (count of defects), the sampling method is established with a view to obtaining a sample which is as representative as possible of a complete dispatched batch, and in order to realize the following objectives :

a) In the case of inspection by variables (measurements)

To determine, for the characteristics taken into consideration, the standard deviation and the mean of the data obtained on the sample. At a 95 % confidence level the two sided confidence interval is calculated in order to verify whether the mean is sufficiently representative of the batch. If such is the case one determines by appropriate statistical calculations (standard deviation method) whether the estimated percentage defective in the batch is acceptable as a function of the AQL defined in the suppliers specification.

b) In the case of inspection by attributes (count of defects)

To determine the percentage of defective elementary units in the sample by classifying each elementary unit as either defective or non-defective by means of defined criteria which are either given in the product specification or agreed between supplier and user.

Taking into account the number of defective units in the sample in relation to the AQL given in the specification, it is possible to check whether or not the batch conforms to the specifications of the supplier.

NOTE — According to the detailed sampling procedures given in ISO 2859 and ISO 3951, this International Standard is intended primarily to be used for a continuing series of lots or batches produced in conditions supposed to be identical.

For quite isolated batches, showing a higher risk of variability, the user can check by means of the operating characteristics curves given in the above-mentioned standards, if the customer's risk connected with the sampling procedure and the AQL designated by the seller is appropriate to the use forecasted for the concerned product.

2 References

ISO 2859, *Sampling procedures and tables for inspection by attributes.*

ISO 3534, *Statistics — Vocabulary and symbols.*

ISO 3951, *Sampling procedures and charts for inspection by variables for per cent defective.*

ISO 6355, *Textile glass — Vocabulary.*

3 Definitions

For the purpose of this International Standard, the definitions given in ISO 2859, ISO 3534, ISO 3951, and ISO 6355, and the following definitions apply.

3.1 elementary units of a textile glass fibre product :

a) package (an individual winding of single yarn, folded or cabled yarn, roving, etc.) in the form of units capable of being unwound and suitable for handling, storing, shipping and use;

b) roll (mat, woven fabric, etc.);

c) the smallest container of a product packed in bulk (chopped or milled fibres).

NOTE — Packages may be without former or may be prepared with various winding patterns on bobbins, cops, cones, pirns, spools, tubes or beams.

3.2 case (carton or other container) : The smallest handleable unit in which one or several elementary units of a similar type and quality can be packed together.

3.3 dispatched batch : A definite quantity of identical cases containing one prescribed product, produced under presumed uniform conditions.

The cases may be arranged individually or several may be assembled together on a pallet. The cases composing a batch are dispatched to, or intended for, a single customer under a single dispatch note.

3.4 acceptable quality level (AQL) : The maximum percent defective (or the maximum number of defects per 100 units) that, for purposes of sampling inspection can be

considered satisfactory as a process average. In a sampling plan, a quality level that corresponds to a specified but relatively high probability of acceptance.

3.5 inspection by attributes (count of defects) : A method of inspection that consists in taking note, for every elementary unit of a batch or of a sample taken from the batch, of the presence or absence of a certain qualitative characteristic (attribute) and in counting how many items have or do not have this characteristic.

The result of this type of inspection is obtained either by classifying each elementary unit as defective or non-defective, or by counting the number of defects per elementary unit in accordance with the appropriate specification.

Inspection by attributes has the advantage of being simple; it is applicable to one or several qualitative parameters and does not require any knowledge of the quantitative variation of these parameters. It does, however, require a larger number of specimens (elementary units) than does inspection by variables. (See table 2.)

3.6 inspection by variables (measurements) : A method of inspection that consists in measuring a quantitative characteristic of each elementary unit of a batch or of a sample taken from this batch.

Inspection by variables has the advantage of requiring a smaller number of specimens (elementary units) than inspection by attributes. (See table 1.)

4 Selection of samples

Tables 1 and 2 indicate the total number of elementary units to be sampled and also specify the number of these elementary units to be sampled from each case, taking into account the number N of elementary units per case.

Table 1 — Inspection by variables (measurements)[1)]

Total number of elementary units in the batch	Total number of elementary units to include in the sample (sample size)	Maximum number of elementary units to take per case							
		Number N of elementary units per case							
		1 to 2	3 to 4	5 to 8	9 to 12	13 to 25	26 to 50	51 to 100	101 to 180
< 3	All	—	—	—	—	—	—	—	—
3 to 8	3	1	2	2	—	—	—	—	—
9 to 15	3	2	2	2	3	3	—	—	—
16 to 25	4	2	2	3	3	4	—	—	—
26 to 40	5	2	2	3	4	4	5	—	—
41 to 65	7	2	2	3	4	4	7	7	—
66 to 110	10	2	2	3	4	5	7	10	10
111 to 180	15	2	3	3	4	5	7	10	15
181 to 300	20	2	3	3	4	5	7	10	15
301 to 500	25	2	3	4	5	5	9	13	15
501 to 800	30	2	3	4	5	5	9	13	15
801 to 1 300	35	2	3	4	5	5	9	13	15
1 301 to 3 200	40	2	3	4	5	6	10	13	15
3 201 to 10 000	50	2	3	4	5	6	10	13	15

1) For batches above 10 000 elementary units or for cases containing more than 180 elementary units, sampling shall be the subject of an agreement between supplier and user.

Table 2 — Inspection by attributes (count of defects)[1)]

Total number of elementary units in the batch	Total number of elementary units to include in the sample (sample size)	Maximum number of elementary units to take per case							
		Number N of elementary units per case							
		1 to 2	3 to 4	5 to 8	9 to 12	13 to 25	26 to 50	51 to 100	101 to 150
2 to 8	2	1	1	1	—	—	—	—	—
9 to 15	3	2	2	2	3	3	—	—	—
16 to 25	5	2	3	4	4	5	—	—	—
26 to 50	8	2	3	4	5	6	8	—	—
51 to 90	13	2	3	5	5	7	9	13	—
91 to 150	20	2	3	5	6	7	10	20	20
151 to 280	32	2	4	6	6	8	15	25	30
281 to 500	50	2	4	6	7	8	25	30	40
501 to 1 200	80	2	4	6	7	10	30	40	50
1 201 to 3 200	125	2	4	7	8	10	30	40	50
3 201 to 10 000	200	2	4	7	8	12	30	40	50

1) For batches above 10 000 elementary units or for cases containing more than 150 elementary units, sampling shall be the subject of an agreement between supplier and user.

5 Procedure

The procedure relates to one dispatched batch.

5.1 Determine the total number of elementary units and cases for the whole batch.

5.2 Using the appropriate table and, taking into account the number N of elementary units per case, determine the total number of cases and elementary units to include in the sample (see example in clause 6).

5.3 For cases assembled by pallet, determine the number of pallets to be sampled by using the two columns on the left of each table, considering the pallets as elementary units.

5.4 In order to take a sample as representative as possible, take care to draw the samples in different places of the selected lots or pallets. It is strongly recommended to number the packing units, pallets, etc., and to use a random number table.

Choose cases showing no evident sign of deterioration (damage, moisture, etc.). For such deteriorated cases, the question of damage is to be treated separately.

5.5 Carry out the required tests.

5.6 Depending on the type of inspection, carry out the following calculations :

5.6.1 Inspection by variables (standard deviation method)

Calculate for each characteristic

a) the average value;

b) the standard deviation;

c) the two sided 95 % confidence interval for the mean.

If this sampling is carried out to check the acceptability of the batch, it is then necessary to calculate the per cent defective in accordance with the standard deviation method described in ISO 3951 and to check whether or not this percentage is acceptable in relation to the AQL given in the product specification.

5.6.2 Inspection by attributes (counting of defectives)

Determine the quantity of defective units in the sample and, on the basis of the AQL guaranteed by the supplier, check whether or not this number of defectives is acceptable by using the tables shown in the appropriate International Standard (see ISO 2859).

6 Example of sampling — Inspection by variables

The batch comprises 8 pallets. Each pallet contains 36 cases, and there are 9 packages (windings) in each case.

a) Total number of packages (windings) =
$8 \times 36 \times 9 = 2\,592$

i.e. 2 592 elementary units.

b) In table 1,

1) take, in column 1, the line "1 301 to 3 200".

— Read in column 2 : 40, i.e. the total number of elementary units to sample is 40.

— Read in column 6 (9 to 12) : 5, i.e. the maximum number of elementary units to sample in each case is 5, from which it follows that a total number of 8 cases have to be sampled.

2) To determine the number of pallets to be sampled, take, in column 1, the line "3 to 8".

— Read in column 2 : 3, i.e. 3 pallets to be sampled.

Summarizing :

— in the lot of 8 pallets, 3 pallets have to be sampled;

— from the whole of the 3 pallets, 8 cases have to be sampled;

— from each of the 8 cases, 5 packages (windings) have to be sampled.

7 Sampling report

The sampling report shall make reference to the present International Standard and in addition mention :

a) the name and address of the user;

b) the name and address of the supplier;

c) the type of product sampled;

d) complete identification of the batch and cases;

e) the type of inspection (either by attributes or variables);

f) the total number of cases, the number of elementary units per case and the total number of elementary units in the batch;

g) the number of cases and elementary units sampled and, if applicable, the number of pallets sampled;

h) the site of sampling;

j) a reference corresponding to the one indicated on the sheets and on the test units.