COMMISSION OF THE EUROPEAN COMMUNITIES

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2009/0006 (COD)

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Proposal for a

REGULATION …/…/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of […]

on textile names and related labelling of textile products

(Text with EEA relevance)

{SEC(2009)91}
{SEC(2009)90}

EXPLANATORY MEMORANDUM

1. BACKGROUND TO THE PROPOSAL

The idea for a revision of Textile Names legislation came to light in recent years as a result of the experience developed with regular technical amendments to introduce new fibre names into the existing Directives. This experience has shown that there was scope to simplify the existing legal framework with potential positive impacts for private stakeholders and public administrations. Thus, the revision of this legislation aims at simplifying and improving the existing regulatory framework for the development and uptake of novel fibres, with a view to encourage innovation in the textile and clothing sector and to allow fibre users and consumers to benefit faster from innovative products.

In addition, the proposed revision will also enhance the transparency of the process to add new fibres to the list of harmonised fibre names. At the same time, it will introduce more flexibility to adapt legislation in order to keep up with the needs of the technological developments expected in the textiles industry.

It is not an objective of the revision to extend EU legislation to other labelling requirements beyond the fibre composition and the harmonisation of textile fibre names covered by the existing Directives.

The revision of EU legislation on Textile Names and Labelling[1] was announced in 2006 in the "First progress report on the strategy for the simplification of the regulatory environment"[2] and was included in the Commission Legislative and Work Programme for 2008.

2. CONSULTATION OF INTERESTED PARTIES

Due to the limited scope of this revision, a targeted consultation of interested parties was conducted. A wide range of stakeholders participated in the consultation process: industry and retail associations, trade unions, consumer organisations, European standardisation bodies, as well as national administrations[3].

Stakeholders and Member States representatives were invited to present their views, suggestions and proposals during a period going from January to August 2008, in the framework of the meetings organized by the Commission services and in writing.

Stakeholders are of the opinion that introducing new fibre names in the European legislation is important to promote innovation in the European industry and from the perspective of consumer's information. However, the political content of technical

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1 Directives 96/74/EC (as amended), 96/73/EC (as amended) and 73/44/EEC.

2 Commission Working Document COM (2006) 690 final

3 CIRFS/BISFA (International Bureau for the Standardisation of Man Made Fibres), Euratex, AEDT (European Association of National Organisations of Textile Retailers), Trade Unions, ANEC (European Association for the Co-ordination of Consumer Representation in Standardisation), BEUC (European Consumers' Organisation), CEN (European Committee for Standardisation), Member States representatives.

amendments to Textile Names legislation does not justify the heavy procedures and costs involved in the transposition of a Directive; therefore, a lighter legislative solution should be used.

Results of the consultation process are available in the Impact Assessment report and its annexes.

3. IMPACT ASSESSMENT

Based on the results of the stakeholder consultation and on the study "Simplification of EU legislation in the field of Textile Names and Labelling – an Impact Assessment of policy options"[4], the Commission carried out an impact assessment of the various policy options to achieve the objectives set out above.

The Impact Assessment Board of the European Commission assessed the draft version of the impact assessment report prepared by the relevant service and approved it subject to some modifications[5].

Analysis and comparison of the various options and their impact lead to the following conclusions:

- The inclusion of guidance on the contents of the application file and the recognition of laboratories to assist companies in compiling the file show potential benefits if they result in the submission of application files more in line with the requirements of the Commission services. This could bring significant time savings for both industry and public authorities.

- The greatest benefits for industry arise from reducing the time taken between an application for a new fibre name being submitted and the ability to place the fibre on the market with the new name. This means savings in administrative costs and earlier realisation of revenue from sale of the fibre.

- The greatest benefits to Member State authorities result from replacing the Directives with a Regulation, because they would no longer need to transpose the amendments into national legislation. This could generate significant cost savings to Member States.

- The revision will retain the benefits for consumers of certainty that the named fibres meet specified characteristics. Consumers may also gain additional benefits from new fibres reaching the market earlier.

4. LEGAL BASIS AND SUBSIDIARITY

EU legislation on Textile Names and Labelling is based on Article 95 of the EC Treaty. It aims at establishing an internal market for textile products while ensuring that consumer receive appropriate information.

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4 Study available at: http://ec.europa.eu/enterprise/textile/index_en.htm

5 http://ec.europa.eu/governance/impact/iab_en.htm

Member States recognised in the 1970's the need for harmonization of Community legislation in the area of textile names. Different (non-harmonised) textile fibre names in the EU Member States would create a technical barrier to trade in the Internal Market. In addition, consumer interests would be better protected if the information provided in this area is the same within the Internal Market.

The current proposal does not modify the political balance between Member States and EU. A Committee is foreseen to assist the Commission and give an opinion on the implementing measures proposed to amend the regulation, following the rules of a regulatory committee with scrutiny. This is the case today with existing Directives.

5. MAIN ELEMENTS OF THE PROPOSAL AND CHANGES TO EXISTING LEGISLATION ON TEXTILE NAMES AND LABELLING.

The main changes to the existing legislation can be summarised as follows:

5.1. Facilitating the legislative process to adapt legislation to technical progress

5.1.1. Transforming Directive 96/74/EC into a Regulation

EU legislation on textile names and labelling needs to be adapted every time a new fibre name is added to the list of harmonised names; such changes are of merely technical nature and can be introduced more simply in the form of a Regulation, reducing thus the administrative burden for national authorities.

5.1.2. Repealing Directives on methods and transforming them into a technical annex

Quantification methods are an essential instrument to allow for the verification of the information provided in the composition label, which also requires update to take account of new fibre names. Given their detailed technical content, the adaptation of such uniform methods is better addressed in the form of annexes to the main Regulation. Therefore, Article 22 repeals Directives 96/73/EC and 73/44/EEC and the proposed Regulation includes an Annex VIII, laying down uniform methods used for official tests.

5.2. Shortening the time between the submission of an application and the adoption of the new fibre name.

In order to allow fibre manufacturers, fibre users and consumers to benefit faster from the use of novel fibres and innovative products, new fibre names should be adopted in EU legislation more rapidly. In addition to the time gained with the changing of Directive 96/74/EC into a Regulation, the time necessary for the technical examination of requests for new fibre names may be reduced if application files submitted by manufacturers are more correct and complete with respect to the requirements they need to fulfil.

5.2.1. Minimum requirements of applications for a new fibre name

A new Article (Article 6) establishes the procedure to be followed by a manufacturer to request the addition of a new fibre name to the technical annexes of the

Regulation. The manufacturer needs to submit an application file to the Commission, taking into consideration the minimum requirements set out in Annex II.

5.2.2. Report on the implementation of the Regulation

Article 21 foresees a report on the implementation of the Regulation, to be drawn up by the Commission after a period of 5 years. The report will focus on assessing the experience obtained with the applications for new fibre names received in that period and it will examine if further gains on time may be obtained from a revision of proposed procedures.

5.3. Other changes

Apart from the amendments set out under points 5.1 and 5.2, the text of existing legislation has been revised in line with recent legislative standards to facilitate its direct applicability and to ensure that citizens, economic operators and public authorities can readily identify their rights and obligations.

The substantive changes made in the proposal are the following:

- Article 1 introduces the subject matter of the regulation

- Article 3 includes additional definitions

- Article 4 sets out general obligations to market textile products

- Article 11 (2) states explicitly the responsibility of economic operators to supply the label and for the information contained therein

- Article 14 on special provisions refers to a technical Annex, which defines detailed rules for certain textile products

- Similarly, article 16 on items excluded from the determination of the fibre percentage refers to a technical annex

- Article 17 sets out market surveillance provisions

- Article 18 specifies the extraneous fibre and manufacturing tolerances

6. ONGOING AMENDMENT OF TEXTILE DIRECTIVES.

In 2006, the Commission services received and application to add the new fibre name “melamine” to the Annexes of Directive 96/74/EC. At exploratory, technical working group meetings with experts from Member States there was a consensus that the application is technically sound. It is therefore appropriate to adapt Directives 96/74/EC and 96/73/EC to technical progress.

Directives 96/74/EC and 96/73/EC will thus be amended in order to include the new fibre name “melamine” in their technical Annexes. According to Article 16(1) of Directive 96/74/EC and Article 5 (2) of Directive 96/73/EC, additions to Annexe I and II of Directive 96/74/EC and additions and amendments to Annex II of Directive

96/73/EC shall be made by the Commission in accordance with the opinion of the Committee for Directives on Textile Names and Labelling.

It is envisaged that the Commission consults the Committee while the present proposal for a new Regulation is following the legislative procedure of adoption in the Council and the European Parliament. It is foreseen that the new fibre "melamine" is added to the Annexes of the Directives after the Committee delivers a favourable opinion on the proposal of the Commission. In order to avoid unnecessary delays and additional amendments, it is thus appropriate that the new Regulation includes the new fibre in brackets [melamine], subject to the favourable opinion of the Committee.

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THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 95 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and Social Committee[6],

Acting in accordance with the procedure laid down in Article 251 of the Treaty[7],

Whereas:

(1) Council Directive 73/44/EEC of 26 February 1973 on the approximation of the laws of the Member States relating to the quantitative analysis of ternary fibre mixtures[8], Directive 96/73/EC of the European Parliament and of the Council of 16 December 1996 on certain methods for the quantitative analysis of binary textile fibre mixtures[9] and Directive 96/74/EC of the European Parliament and of the Council of 16 December 1996 on textile names (recast)[10], have been amended several times. Since further amendments are to be made, they should be replaced by a single legal instrument, in the interest of clarity.

(2) The Community legislation on Textile Names and related Labelling of Textile Products is very technical in its content, with detailed provisions that need to be adapted regularly. In order to avoid the need for Member States to transpose the technical amendments into national legislation and thus reduce the administrative burden for national authorities and in order to allow for a faster adoption of new fibre names to be applied at the same time throughout the Community, a Regulation appears as the most appropriate legal instrument to carry out the legislative simplification.

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6 OJ C , , p. .
7 OJ C , , p. .
8 OJ L 83, 30.3.1973, p. 1
9 OJ L 32, 3.2.1997, p. 1.
10 OJ L 32, 3.2.1997, p.38

(3) In order to eliminate potential obstacles to the proper functioning of the internal market caused by diverging provisions of the Member States with regard to the names, composition and labelling of textile products, it is necessary to harmonize the names of textile fibres and the indications appearing on labels, markings and documents which accompany textile products at the various stages of their production, processing and distribution.

(4) It is appropriate to lay down rules enabling the manufacturers to ask for the inclusion of a new fibre name on the list of permitted fibre names.

(5) Provision should also be made in respect of certain products which are not made exclusively of textile materials but have a textile content which constitutes an essential part of the product or to which attention is specifically drawn by the manufacturer, processor or trader.

(6) The tolerance in respect of 'other fibres', which are not to be stated on the labels should apply to both pure products and to mixtures.

(7) Composition labelling should be compulsory to ensure correct information is made available to all consumers in the Community at a uniform level. Where it is technically difficult to specify the composition of a product at the time of manufacture, it should be possible to state, on the label, only those fibres which are known at the time of manufacture provided that they account for a certain percentage of the finished product.

(8) In order to avoid the differences in practice among the Member States, it is necessary to lay down the exact methods of labelling for certain textile products consisting of two or more components, and also to specify the components of textile products that need not be taken into account for purposes of labelling and analysis.

(9) Textile products subject only to the requirements of inclusive labelling, and those sold by the metre or in cut lengths, should be offered for sale in such a way that the consumer can fully acquaint himself with the information affixed to the overall packaging or the roll.

(10) The use of descriptions or names which enjoy particular prestige among users and consumers should be made subject to certain conditions. Furthermore, in order to provide information to users and consumers, it is appropriate that the fibre names are related to the characteristics of the fibre.

(11) Market surveillance of products under the scope of this Regulation in the Member States should be subject to the provisions of Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety[11].

(12) It is necessary to lay down methods for the sampling and analysis of textile products in order to exclude any possibility of objections to the methods used. The methods used for official tests carried out in the Member States to determine the fibre composition of textile products composed of binary and ternary mixtures should be uniform, as regards both the pre-treatment of the sample and its quantitative analysis; therefore

[11] OJ L35, 6.2.2004, p. 39

this Regulation should lay down uniform methods of analysis for most of the textile products composed of binary and ternary mixtures that are on the market.

(13) In the case of binary mixtures for which there is no uniform method of analysis at Community level, the laboratory responsible for the test should be allowed to determine the composition of such mixtures using any valid method at its disposal, indicating in the analysis report the result obtained and, in so far as this is known, the degree of accuracy of the method used.

(14) This Regulation should set out the agreed allowances to be applied to the anhydrous mass of each fibre during the determination by analysis of the fibre content of textile products, and should give two different agreed allowances for calculating the composition of carded or combed fibres containing wool and/or animal hair. Since it cannot always be established whether a product is carded or combed, and consequently inconsistent results can arise from the application of the tolerances during checks on the conformity of textile products carried out in the Community, The laboratories carrying out those checks should be authorized to apply a single agreed allowance in doubtful cases.

(15) Rules should be laid down in respect of products exempt from the general labelling requirements of this Regulation, in particular disposable products or products for which only inclusive labelling is required.

(16) It is appropriate to establish a procedure, to be observed by any manufacturer or its representative that wishes to include a new fibre name in the technical Annexes. This Regulation should thus set out requirements to apply for a new fibre name to be added to the technical Annexes.

(17) The measures necessary for the implementation of this Regulation should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission[12].

(18) In particular the Commission should be empowered to adapt to technical progress the list of fibre names and the related descriptions, the minimum requirements for the technical file to be annexed to the application by the manufacturer for the addition of a new fibre name to the list of permitted fibre names, the special provisions concerning corsetry products and certain types of textiles, the list of products for which labelling or marking is not mandatory, the list of products for which only inclusive labelling or marking is mandatory, the list of items not to be taken into account for the determination of fibre percentages, the agreed allowances used to calculate the mass of fibres contained in a textile product, as well as to adapt the existing or to adopt new methods of quantitative analysis for binary and ternary mixtures,. Since those measures are of general scope and are designed to amend non-essential elements of this Regulation, inter alia by supplementing it with new non-essential elements, they must be adopted in accordance with the regulatory procedure with scrutiny provided for in Article 5a of Decision 1999/468/EC.

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[12] OJ L 184, 17.7.1999, p. 23.

(19) Since the objectives of the action to be taken, that is the adoption of uniform rules for the use of textile names and related labelling of textile products, cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale of the action, be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve those objectives.

(20) Directives 96/74/EC [or recast], 96/73/EC and 73/44/EC should be repealed,

HAVE ADOPTED THIS REGULATION:

Chapter 1

General provisions

Article 1

Subject matter

This Regulation lays down rules concerning the use of textile names and related labelling of textile products as well as the rules concerning the quantitative analysis of binary and ternary textile fibre mixtures.

Article 2

Scope

1. This Regulation applies to textile products.

It also applies to the following products:

(a) products containing at least 80 % by weight of textile fibres;

(b) furniture, umbrella and sunshade coverings containing at least 80 % by weight of textile components;

(c) the textile components of multi-layer floor coverings, of mattresses and of camping goods, and warm linings of footwear, gloves, mittens and mitts, provided such parts or linings constitute at least 80 % by weight of the complete product;

(d) textiles incorporated in other products and forming an integral part thereof, where their composition is specified.

2. The provisions of this Regulation do not apply to textile products which:

(a) are intended for export to third countries;

(b) enter Member States, under customs control, for transit purposes;

(c) are imported from third countries for inward processing;

(d) are contracted out to persons working in their own homes, or to independent firms that make up work from materials supplied without the property therein being transferred for consideration.

Article 3

Definitions

1. For the purposes of this Regulation, the following definitions apply:

(a) 'textile products' means any raw, semi-worked, worked, semi-manufactured, manufactured, semi-made-up or made-up products which are exclusively composed of textile fibres, regardless of the mixing or assembly process employed;

(b) 'textile fibre' means either of the following:

(i) a unit of matter characterized by its flexibility, fineness and high ratio of length to maximum transverse dimension, which render it suitable for textile applications;

(ii) flexible strips or tubes, of which the apparent width does not exceed 5 mm, including strips cut from wider strips or films, produced from the substances used for the manufacture of the fibres listed in table 2 in Annex I and suitable for textile applications;

(c) 'the apparent width' is the width of the strip or tube when folded, flattened, compressed or twisted, or the average width where the width is not uniform;

(d) 'textile component' means a part of a textile product with a distinct fibre content;

(e) 'extraneous fibres' are fibres other than those stated on the label;

(f) 'lining' means a separate item used in making-up garments and other products, consisting of a single layer or multiple layers of textile material loosely held in place along one or more of the edges;

(g) 'inclusive labelling' means a means of labelling whereby a single label is used for several textile products or components;

(h) 'disposable products' means textile products designed to be used once only or for a limited time, and the normal use of which precludes any restoring for subsequent use for the same or a similar purpose.

Article 4

General rules

1. Textile products may be marketed within the Community, either before or during their industrial processing or at any of the distribution stages, only where such products are labelled according to the provisions of this Regulation.

2. The application of this Regulation shall be without prejudice to the application of the national and Community rules on protection of industrial and commercial property, on indications of provenance, marks of origin and the prevention of unfair competition.

Chapter 2

Textile fibre names and related labelling requirements

Article 5

Textile fibre names

1. Only the names of fibres listed in Annex I shall be used for composition labelling.

2. Use of the names listed in Annex I shall be reserved for fibres whose nature corresponds to the description set out in that Annex.

The names shall not be used for other fibres, whether on their own or as a root or as an adjective.

The term ‘silk’ may not be used to indicate the shape or particular presentation in continuous yarn of textile fibres.

Article 6

Applications for new fibre names

Any manufacturer or its representative may apply to the Commission to add a new fibre name to the list set out in Annex I.

The application shall include a technical file compiled in accordance with Annex II

Article 7

Pure products

1. Only textile products exclusively composed of the same fibre may be labelled as ‘100 %’, ‘pure’ or ‘all’.

Those or similar terms shall not be used for other products.

2. A textile product shall be considered as exclusively composed of the same fibre if it contains up to 2 % by weight of other fibres, provided this quantity is justified on technical grounds and is not added as a matter of routine.

Under the same condition, a textile product, which has undergone a carding process, shall be considered as exclusively composed of the same fibre if it contains up to 5% by weight of other fibres.

Article 8

Wool products

1. A textile product may be labelled by one of the names referred to in Annex III provided that it is composed exclusively of a wool fibre which has not previously been incorporated in a finished product, which has not been subjected to any spinning and/or felting processes other than those required in the manufacture of that product, and which has not been damaged by treatment or use.

2. By way of derogation from paragraph 1, the names listed in Annex III may be used to describe wool contained in a fibre mixture if all the following conditions are complied with:

(a) all the wool contained in that mixture satisfies the requirements defined in paragraph 1;

(b) such wool accounts for not less than 25 % of the total weight of the mixture;

(c) in the case of a scribbled mixture, the wool is mixed with only one other fibre;

The full percentage composition of such mixture shall be given.

3. The fibrous impurities in the products referred to in paragraphs 1 and 2, including wool products which have undergone a carding process, shall not exceed 0,3 % and shall be justified by technical reasons connected with manufacture.

Article 9

Multi-fibre textile products

1. A textile product composed of two or more fibres, one of which accounts for at least 85 % of the total weight, shall be labelled by one of the following:

(a) the name of the fibre which accounts for at least 85% of the total weight followed by its percentage by weight;

(b) the name of the fibre which accounts for at least 85% of the total weight followed by the words ‘85 % minimum’;

(c) the full percentage composition of the product.

2. A textile product composed of two or more fibres, none of which accounts for as much as 85 % of the total weight, shall be labelled by the name and percentage by weight of at least two fibres with the highest percentage by weight, followed by the names of the other constituent fibres in descending order of the percentage by weight, with or without an indication of their percentage by weight.

However, the following rules shall also apply:

(a) fibres which separately account for less than 10 % of the total weight of a product may be collectively designated by the term ‘other fibres’, followed by the total percentage by weight;

(b) where the name of a fibre which accounts for less than 10 % of the total weight of a product is specified, the full percentage composition of that product shall be given.

3. Products having a pure cotton warp and a pure flax weft, in which the percentage of flax accounts for at least 40 % of the total weight of the unsized fabric may be given the name ‘cotton linen union’ which must be accompanied by the composition specification ‘pure cotton warp — pure flax weft’.

4. For textile products the composition of which cannot easily be stated at the time of their manufacture, the term ‘mixed fibres’ or the term ‘unspecified textile composition’ may be used on the label.

Article 10

Decorative fibres and fibres with antistatic effect

Visible, isolable fibres which are purely decorative and do not exceed 7 % of the weight of the finished product need not be mentioned in the fibre compositions provided for in Articles 7 and 9.

The same shall apply to metallic fibres and other fibres which are incorporated in order to obtain an antistatic effect and which do not exceed 2 % of the weight of the finished product.

In the case of the products referred to in Article 9(3), such percentages shall be calculated on the weight of the warp and that of the weft separately.

Article 11

Labels and marking

1. Textile products shall be labelled or marked whenever they are put on the market.

However, labels or marking may be replaced or supplemented by accompanying commercial documents when the products are not being offered for sale to the end consumer, or when they are delivered in performance of an order placed by the State or by some other legal person governed by public law.

2. The manufacturer or his authorized agent established in the Community or, if neither the manufacturer nor his authorized agent is established in the Community, the economic operator responsible for first placing the textile product on the Community market shall ensure the supply of the label and the accuracy of the information contained therein.

The distributor shall ensure that the textile products sold by him bear the appropriate labelling prescribed by this Regulation.

The persons referred to in the first and second subparagraphs shall ensure that any information supplied when textile products are placed on the market cannot be confused with the names and descriptions laid down by this Regulation.

Article 12

The use of names and descriptions

1. The names and descriptions referred to in Articles 5, 7, 8 and 9 shall be clearly indicated in sales contracts, bills, invoices and other commercial documents.

The use of abbreviations is not allowed. However, a mechanized processing code may be used, provided that code is explained in the same document.

2. The names and descriptions referred to in Articles 5, 7, 8 and 9 shall be indicated in catalogues and trade literature, on packaging, labels and marking in clear, legible and uniform print when textile products are offered for sale.

3. Trade marks or the name of the undertaking may be given immediately before or after names and descriptions referred to in Articles 5, 7, 8 and 9.

However, where a trade mark or a name of an undertaking contains, on its own or as an adjective or as a root, one of the names listed in Annex I or a name liable to be confused therewith, such trade mark or name shall be given immediately before or after names and descriptions referred to in Articles 5, 7, 8 and 9.

Other information shall be always displayed separately.

4. The labelling and marking shall be available in the language or languages of the Member State on which territory the textile products are offered for sale or are sold to the end consumer if it is required by legislation of that Member State.

In the case of bobbins, reels, skeins, balls or other small quantity of sewing, mending and embroidery yarns, the first subparagraph shall apply to the inclusive labelling referred to in Article 15(3). Individual items may be labelled in any one of the Community languages.

Article 13

Multi-component textile products

1. Any textile product containing two or more components shall bear a label stating the fibre content of each component.

Such labelling shall not be compulsory for components other than main linings and representing less than 30 % of the total weight of the product.

2. Where two or more textile products have the same fibre content and normally form a single unit, they may bear only one label.

Article 14

Special provisions

The fibre composition of products listed in Annex IV shall be indicated according to the labelling rules set out in that Annex.

Article 15

Derogations

1. By way of derogation from Articles 11, 12 and 13, the rules laid down in paragraphs 2, 3 and 4 of this Article shall apply.

In any case, the products referred to in paragraph 3 and 4 of this Article shall be offered for sale in such a way that the end consumer can fully acquaint himself with the composition of those products.

2. The indication of fibre names or fibre composition on the labels or marking of textile products listed in Annex V is not required.

However, where a trade mark or name of an undertaking contains, on its own or as an adjective or as a root, one of the names listed in Annex I or a name liable to be confused therewith, Articles 11, 12 and 13 shall apply.

3. Where textile products listed in Annex VI are of the same type and composition, they may be offered for sale together under an inclusive label.

4. The composition of textile products sold by the metre may be shown on the length or roll offered for sale.

Chapter 3

Fibre percentages and tolerances

Article 16

Items not to be taken into account for the determination of fibre percentages

In the determination of percentages set out in Articles 7, 8 and 9 to be displayed pursuant to Article 11, the items listed in Annex VII shall not be taken into account.

Article 17

Market surveillance provisions

1. National market surveillance authorities shall carry out checks on the conformity of the composition of textile products with the supplied information related to the composition of those products in accordance with Directive 2001/95/EC.

2. The checks referred to in paragraph 1 shall be carried out in accordance with the methods of sampling and quantitative analysis of certain binary and ternary fibre mixtures set out in Annex VIII.

For those purposes, the fibre percentages set out in Articles 7, 8 and 9 shall be determined by applying to the anhydrous mass of each fibre the appropriate agreed allowance laid down in Annex IX, after having removed the items set out in Annex VII.

3. Any laboratory responsible for the testing of textile mixtures for which there is no uniform method of analysis at Community level shall determine the composition of such mixtures by using any valid method at its disposal, indicating in the analysis report the result obtained and, in so far as this is known, the degree of accuracy of the method used.

Article 18

Tolerances

1. For the purposes of establishing the composition of textile products intended for the end consumer, the tolerances laid down paragraphs 2, 3 and 4 shall apply.

2. The presence of extraneous fibres in the composition to be provided in accordance with Article 9 does not need to be indicated if the percentage of those fibres does not reach the following:

(a) 2 % of the total weight of the textile product, provided that that quantity is justified on technical grounds and is not added as a matter of routine;

(b) 5 % in the case of products which have undergone a carding process.

Point (b) of this paragraph shall be without prejudice to Article 8(3).

3. A manufacturing tolerance of 3 % shall be permitted between the stated fibre percentages to be provided in accordance with Article 9 and the percentages obtained from analysis carried out in accordance with Article 17, in relation to the total weight of fibres shown on the label. Such tolerance shall also apply to the following:

(a) fibres which are listed with no indication of their percentage in accordance with Article 9(2);

(b) the percentage of wool referred to in Article 8(2)(b).

For the purposes of the analysis, the tolerances shall be calculated separately. The total weight to be taken into account in calculating the tolerance referred to in this paragraph shall be that of the fibres of the finished product less the weight of any extraneous fibres found when applying the tolerance referred to in paragraph 2.

The addition of the tolerances referred to in paragraphs 2 and 3 shall be permitted only if any extraneous fibres found by analysis, when applying the tolerance referred to in paragraph 2, prove to be of the same chemical type as one or more of the fibres shown on the label.

4. In the case of particular products for which the manufacturing process requires tolerances higher than those laid down in paragraphs 2 and 3, higher tolerances may be authorized by the Commission when the conformity of the product is checked pursuant to Article 17(1) only in exceptional cases and where adequate justification is provided by the manufacturer.

The manufacturer shall submit a request providing sufficient reasons and evidence of the exceptional manufacturing circumstances.

Chapter 4

Final provisions

Article 19

Amendment of the Annexes

1. The Commission may adopt any amendments to Annexes I, II, IV, V, VI, VII, VIII and IX which are necessary for adapting these Annexes to technical progress.

2. The measures referred to in paragraph 1, designed to amend non-essential elements of this Regulation, inter alia, by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 20(2).

Article 20

Committee

1. The Commission shall be assisted by the Committee for Textile Names and Labelling.

2. Where reference is made to this paragraph, Article 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

Article 21

Reporting

By [DATE = 5 years from the entry into force of this Regulation] at the latest, the Commission shall submit a report to the European Parliament and to the Council on the implementation of this Regulation, with an emphasis on the requests and adoption of new fibre names.

Article 22

Repeal

Directives 73/44/EC, 96/73/EC and 96/74/EC [or recast] are repealed with effect from the date of entry into force of this Regulation.

References to the repealed Directives shall be construed as references to this Regulation and shall be read in accordance with the correlation table in Annex X.

Article 23

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Communities*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, […]

For the European Parliament	*For the Council*
The President	*The President*
[…]	*[…]*

ANNEX I

TABLE OF TEXTILE FIBRES

Table 1

Number	Name	Fibre description
1	wool	Fibre from sheep's or lambs' fleeces *(Ovis aries*) or a mixture of fibres from sheep's or lambs' fleeces and the hairs of animals listed in item 2
2	alpaca, llama, camel, kashmir, mohair, angora vicuna, yak, guanaco, cashgora, beaver, otter, followed or not by the name 'wool' or 'hair'	hair of the following animals: alpaca, llama, camel, kashmir goat, angora goat, angora rabbit, vicuna, yak, guanaco, cashgora goat, beaver, otter
3	animal or horsehair, with or without an indication of the kind of animal (e.g. cattle hair, common goat hair, horsehair)	hair of the various animals not mentioned under 1 or 2
4	silk	fibre obtained exclusively from silk-secreting insects
5	cotton	fibre obtained from the bolls of the cotton plant *(Gossypium)*
6	kapok	fibre obtained from the inside of the kapok fruit *(Ceiba pentandra)*
7	flax	fibre obtained from the bast of the flax plant *(Linum usitatissimum)*
8	true hemp	fibre obtained from the bast of hemp *(Cannabis sativa)*
9	jute	fibre obtained from the bast of *Corchorus olitorius* and *Corchorus capsularis*. For the purposes of this Regulation, bast fibres obtained from the following species shall be treated in the same way as jute: *Hibiscus cannabinus*, *Hibiscus sabdariffa*, *Abultilon avicennae*, *Urena lobata*, *Urena sinuata*
10	abaca (Manila hemp)	fibre obtained from the sheathing leaf of *Musa textilis*
11	alfa	fibre obtained from the leaves of *Stipa tenacissima*

12	coir (coconut)	fibre obtained from the fruit of *Cocos nucifera*
13	broom	fibre obtained from the bast of *Cytisus scoparius* and/or *Spartium Junceum*
14	ramie	fibre obtained from the bast of *Boehmeria nivea* and *Boehmeria tenacissima*
15	sisal	fibre obtained from the leaves of *agave sisalana*
16	Sunn	fibre from the bast of *Crotalaria juncea*
17	Henequen	fibre from the bast of *Agave Fourcroydes*
18	Maguey	fibre from the bast of *Agave Cantala*

Table 2

19	acetate	cellulose acetate fibre wherein less than 92 % but at least 74 % of the hydroxyl groups are acetylated
20	alginate	fibre obtained from metallic salts of alginic acid
21	cupro (cuprammonium rayon)	regenerated cellulose fibre obtained by the cuprammonium process
22	modal	a regenerated cellulose fibre obtained by a modified viscose process having a high breaking force and high wet modulus. The breaking force (B_C) in the conditioned state and the force (B_M) required to produce an elongation of 5 % in the wet state are: $B_C\,(CN) \geq 1{,}3\ \sqrt{T} + 2\ T$ $B_M\,(CN) \geq 0{,}5\ \sqrt{T}$ where T is the mean linear density in decitex
23	protein	fibre obtained from natural protein substances regenerated and stabilized through the action of chemical agents
24	triacetate	cellulose acetate fibre wherein at least 92 % of the hydroxyl groups are acetylated
25	viscose	regenerated cellulose fibre obtained by the viscose process for filament and discontinuous fibre
26	acrylic	fibre formed of linear macromolecules comprising at least 85 % (by mass) in the chain of the acrylonitrilic

		pattern
27	chlorofibre	fibre formed of linear macromolecules having in their chain more than 50 % by mass of chlorinated vinyl or chlorinated vinylidene monomeric units
28	fluorofibre	fibre formed of linear macromolecules made from fluorocarbon aliphatic monomers
29	modacrylic	fibre formed of linear macromolecules having in the chain more than 50 % and less than 85 % (by mass) of the acrylonitrilic pattern
30	polyamide or nylon	fibre formed from synthetic linear macromolecules having in the chain recurring amide linkages of which at least 85 % are joined to aliphatic or cycloaliphatic units
31	aramid	fibre formed from synthetic linear macromolecules made up of aromatic groups joined by amide or imide linkages, of which at least 85 % are joined directly to two aromatic rings and with the number of imide linkages, if the latter are present, not exceeding the number of amide linkages
32	polyimide	fibre formed from synthetic linear macromolecules having in the chain recurring imide units
33	lyocell	a regenerated cellulose fibre obtained by dissolution, and an organic solvent (mixture of organic chemicals and water) spinning process, without formation of derivatives
34	polylactide	fibre formed of linear macromolecules having in the chain at least 85% (by mass) of lactic acid ester units derived from naturally occurring sugars, and which has a melting temperature of at least 135 °C
35	polyester	fibre formed of linear macromolecules comprising at least 85 % (by mass) in the chain of an ester of a diol and terephthalic acid
36	polyethylene	fibre formed of un-substituted aliphatic saturated hydrocarbon linear macromolecules
37	polypropylene	fibre formed of an aliphatic saturated hydrocarbon linear macromolecule where one carbon atom in two carries a methyl side chain in an isotactic disposition and without further substitution
38	polycarbamide	fibre formed of linear macromolecules having in the chain the recurring ureylene (NH—CO—NH) functional

		group
39	polyurethane	fibre formed of linear macromolecules composed of chains with the recurring urethane functional group
40	vinylal	fibre formed of linear macromolecules whose chain is constituted by poly(vinyl alcohol) with differing levels of acetalization
41	trivinyl	fibre formed of acrylonitrile terpolymer, a chlorinated vinyl monomer and a third vinyl monomer, none of which represents as much as 50 % of the total mass
42	elastodiene	elastofibre composed of natural or synthetic polyisoprene, or composed of one or more dienes polymerized with or without one or more vinyl monomers, and which, when stretched to three times its original length and released, recovers rapidly and substantially to its initial length
43	elastane	elastofibre composed of at least 85 % (by mass) of a segmented polyurethane, and which, when stretched to three times its original length and released, recovers rapidly and substantially to its initial length
44	glass fibre	fibre made of glass
45	name corresponding to the material of which the fibres are composed, e.g. metal (metallic, metallized), asbestos, paper, followed or not by the word ‘yarn’ or ‘fibre’	fibres obtained from miscellaneous or new materials not listed above
46	elastomultiester	fibre formed by interaction of two or more chemically distinct linear macromolecules in two or more distinct phases (of which none exceeds 85% by mass) which contains ester groups as dominant functional unit (at least 85%) and which, after suitable treatment when stretched to one and half times its original length and released, recovers rapidly and substantially to its initial length
47	Elastolefin	fibre composed of at least 95% (by mass) of macromolecules partially cross-linked, made up from ethylene and at least one other olefin and which, when stretched to one and a half times its original length and released, recovers rapidly and substantially to its initial length

48	Melamine	fibre formed of at least 85% by mass of cross-linked macromolecules made up of melamine derivatives

ANNEX II

MINIMUM REQUIREMENTS FOR A TECHNICAL FILE TO APPLY FOR A NEW FIBRE NAME

(Article 6)

A technical file to propose a new fibre name for inclusion in Annex I, as referred to in Article 6, shall contain at least the following information:

– Proposed name of the fibre;

  The name proposed shall be related to the chemical composition and shall provide information about the characteristics of the fibre, if appropriate. The name proposed shall be free of rights and shall not be linked to the manufacturer.

– Proposed definition of the fibre;

  The characteristics mentioned in the definition of the new fibre, such as for example elasticity, shall be verifiable via testing methods to be provided with the technical file along with the experimental results of analyses.

– Identification of the fibre: chemical formula, differences from existing fibres, together with, where relevant, detailed data such as melting point, density, refractive index, burning behaviour and FTIR spectrum;

– Proposed agreed allowance;

– Sufficiently developed identification and quantification methods, including experimental data;

  The applicant shall evaluate the possibility to use the methods listed in Annex VIII to this Regulation to analyse the most expected commercial mixtures of the new fibre with other fibres and shall propose at least one of those methods. For those methods where the fibre can be considered as insoluble component, the applicant shall evaluate the mass correction factors of the new fibre. All the experimental data shall be submitted with the application

  If methods listed in this Regulation are not suitable, the applicant shall provide adequate reasoning and propose a new method.

  The application shall contain all the experimental data for the methods proposed. Data on the accuracy, robustness and repeatability of the methods shall be provided with the file.

– Additional information to support the application: production process, consumer relevance;

– The manufacturer or its representative shall provide representative samples of the new pure fibre and the relevant fibre mixtures necessary to conduct the validation of the proposed identification and quantification methods, upon request of the Commission.

ANNEX III

NAMES REFERRED TO IN ARTICLE 8(1)

– in Bulgarian: ‘необработена вълна’,

– in Spanish: ‘lana virgen’ or ‘lana de esquilado’,

– in Czech: ‘střižní vlna’,

– in Danish: ‘ren, ny uld’,

– in German: ‘Schurwolle’,

– in Estonian: ‘uus vill’,

– in Irish: 'olann lomra'

– in Greek: ‘παρθένο μαλλί’,

– in English: ‘fleece wool’ or ‘virgin wool’,

– in French: ‘laine vierge’ or ‘laine de tonte’,

– in Italian: ‘lana vergine’ or ‘lana di tosa’,

– in Latvian: ‘pirmlietojuma vilna’ or ‘cirptā vilna’,

– in Lithuanian: ‘natūralioji vilna’,

– in Hungarian: ‘élőgyapjú’,

– in Maltese: ‘suf verġni’,

– in Dutch: ‘scheerwol’,

– in Polish: ‘żywa wełna’,

– in Portuguese: ‘lã virgem’,

– in Romanian: ‘lână virgină’,

– in Slovak: ‘strižná vlna’,

– in Slovene: ‘runska volna’,

– in Finnish: ‘uusi villa’,

– in Swedish: ‘ren ull’.

ANNEX IV

SPECIAL PROVISIONS FOR THE LABELLING OF CERTAIN PRODUCTS

(Article 14)

Products		Labelling provisions
1. The following corsetry products:		The fibre composition shall be indicated on the label by stating the composition of the whole product or, either inclusively or separately, that of the components listed respectively:
	(a) Brassières	The outside and the inside fabric of the cups and back
	(b) Corsets	The front, the rear and side stiffening panels
	(c) Corselets	The outside and inside fabric of the cups, the front and rear stiffening panels and the side panels
2. Other corsetry products not listed above		The fibre composition shall be indicated by stating the composition of the whole product or, either inclusively or separately, the composition of the various components of the products. Such labelling shall not be compulsory for components representing less than 10 % of the total weight of the product.
3. All corsetry products		The separate labelling of the various parts of corsetry products shall be carried out in such a way that the end consumer can easily understand to which part of the product the information on the label refers.
4. Etch-printed textiles		The fibre composition shall be given for the product as a whole and may be indicated by stating, separately, the composition of the base fabric and that of the etched parts. Those components shall be mentioned by name
5. Embroidered textiles		The fibre composition shall be given for the product as a whole and may be indicated by stating, separately, the composition of the base fabric and that of the embroidery yarn. Those components shall be mentioned by name. Such labelling is compulsory only for the embroidered parts which amount to at least 10 % of the surface area of the product.
6. Yarns consisting of a core and a cover made up of different fibres and offered for sale as such to the consumer		The fibre composition shall be given for the product as a whole and may be indicated by stating the composition of the core and the cover separately. Those components shall be mentioned by name
7. Velvet and plush textiles, or		The fibre composition shall be given for the whole

textiles resembling velvet or plush	product and, where the product comprises a distinct backing and a use-surface composed of different fibres, may be stated separately for those components. Those components shall be mentioned by name
8. Floor coverings and carpets of which the backing and the use-surface are composed of different fibres	The composition may be stated for the use-surface alone. The use-surface must be mentioned by name

ANNEX V

PRODUCTS FOR WHICH LABELLING OR MARKING IS NOT MANDATORY

(Article 15(2))

1. Sleeve-supporting armbands
2. Watch straps of textile materials
3. Labels and badges
4. Stuffed pan-holders of textile materials
5. Coffee cosy covers
6. Tea cosy covers
7. Sleeve protectors
8. Muffs other than in pile fabric
9. Artificial flowers
10. Pin cushions
11. Painted canvas
12. Textile products for base and underlying fabrics and stiffenings
13. Felts
14. Old made-up textile products, where explicitly stated to be such
15. Gaiters
16. Packagings, not new and sold as such
17. Felt hats
18. Containers which are soft and without foundation, saddlery, of textile materials
19. Travel goods of textile materials
20. Hand-embroidered tapestries, finished or unfinished, and materials for their production, including embroidery yarns, sold separately from the canvas and specially presented for use in such tapestries
21. Slide fasteners
22. Buttons and buckles covered with textile materials
23. Book covers of textile materials

24. Toys

25. Textile parts of footwear, excepting warm linings

26. Table mats having several components and a surface area of not more than 500 cm^2

27. Oven gloves and cloths

28. Egg cosies

29. Make-up cases

30. Tobacco pouches of textile fabric

31. Spectacle, cigarette and cigar, lighter and comb cases of textile fabric

32. Protective requisites for sports with the exception of gloves

33. Toilet cases

34. Shoe-cleaning cases

35. Funeral items

36. Disposable products, with the exception of wadding

37. Textile products subject to the rules of the *European Pharmacopoeia* and covered by a reference to those rules, non-disposable bandages for medical and orthopaedic use and orthopaedic textile products in general

38. Textile products including cordage, ropes and string, subject to item 12 of Annex VI, normally intended:

    (a) for use as equipment components in the manufacture and processing of goods;

    (b) for incorporation in machines, installations (e.g. for heating, air conditioning or lighting), domestic and other appliances, vehicles and other means of transport, or for their operation, maintenance or equipment, other than tarpaulin covers and textile motor vehicle accessories sold separately from the vehicle

39. Textile products for protection and safety purposes such as safety belts, parachutes, life-jackets, emergency chutes, fire-fighting devices, bulletproof waistcoats and special protective garments (e.g. protection against fire, chemical substances or other safety hazards)

40. Air-supported structures (e.g. sports halls, exhibition stands or storage facilities), provided that details of the performances and technical specifications of these products are supplied

41. Sails

42. Animal clothing

43. Flags and banners

ANNEX VI

PRODUCTS FOR WHICH ONLY INCLUSIVE LABELLING OR MARKING IS MANDATORY

(Article 15(3))

1. Floorcloths
2. Cleaning cloths
3. Edgings and trimmings
4. Passementerie
5. Belts
6. Braces
7. Suspenders and garters
8. Shoe and boot laces
9. Ribbons
10. Elastic
11. New packaging sold as such
12. Packing string and agricultural twine; string, cordage and ropes other than those falling within item 38 of Annex V[13]
13. Table mats
14. Handkerchiefs
15. Bun nets and hair nets
16. Ties and bow ties for children
17. Bibs; washgloves and face flannels
18. Sewing, mending and embroidery yarns presented for retail sale in small quantities with a net weight of 1 gram or less
19. Tape for curtains and blinds and shutters

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[13] For the products falling within this item and sold in cut lengths, the inclusive labelling shall be that of the reel. The cordage and ropes falling within this item include those used in mountaineering and water sports.

ANNEX VII

ITEMS NOT TO BE TAKEN INTO ACCOUNT FOR THE DETERMINATION OF FIBRE PERCENTAGES

(Article 16))

Products	Items excluded
a) All textile products	(i) Non-textile parts, selvedges, labels and badges, edgings and trimmings not forming an integral part of the product, buttons and buckles covered with textile materials, accessories, decorations, non-elastic ribbons, elastic threads and bands added at specific and limited points of the product. (ii) Fatty substances, binders, weightings, sizings and dressings, impregnating products, additional dyeing and printing products and other textile processing products.
b) Floor coverings and carpets	All components other than the use-surface
c) Upholstery fabrics	Binding and filling warps and wefts which do not form part of the use-surface
d) Hangings and curtains	Binding and filling warps and wefts which do not form part of the right side of the fabric
e) Socks	Elastic yarns used in the cuff and the stiffening and reinforcement yarns of the toe and the heel
f) Tights	Elastic yarns used in the belt and the stiffening and reinforcement yarns of the toe and the heel
g) Textile products other than those under points b) to f)	Base or underlying fabrics, stiffenings and reinforcements, inter-linings and canvas backings, stitching and assembly threads unless they replace the warp and/or weft of the fabric, fillings not having an insulating function and, subject to Article 13(1), linings. For the purposes of this provision: (i) the base or underlying material of textile products which serve as a backing for the use-surface, in particular in blankets and double fabrics, and the backings of velvet or plush fabrics and kindred products shall not be regarded as backings to be removed (ii) 'stiffenings and reinforcements' mean the yarns or materials added at specific and limited points of the textile products to strengthen them or to give them stiffness or thickness

ANNEX VIII

METHODS FOR THE QUANTITATIVE ANALYSIS OF BINARY AND TERNARY TEXTILE FIBRE MIXTURES

CHAPTER 1

I. Preparation of test samples and test specimens to determine the fibre composition of textile products

1. FIELD OF APPLICATION

This Chapter gives procedures for obtaining laboratory test samples of a suitable size for pre-treatment for quantitative analysis (i.e. of a mass not exceeding 100 g) from laboratory bulk samples, and for selecting test specimens from the laboratory test samples that have been pre-treated to remove non-fibrous matter[14].

2. DEFINITIONS

2.1. Bulk source — The quantity of material which is assessed on the basis of one series of test results. This may comprise, for example, all the material in one delivery of cloth; all the cloth woven from a particular beam; a consignment of yarn, a bale or a group of bales of raw fibre.

2.2. Laboratory bulk sample — The portion of the bulk source taken to be representative of the whole, and which is available to the laboratory. The size and nature of the laboratory bulk sample shall be sufficient to adequately overcome the variability of the bulk source and to facilitate ease of handling in the laboratory[15].

2.3. Laboratory test sample — That portion of the laboratory bulk sample that is subjected to pre-treatment to remove non-fibrous matter, and from which test specimens are taken. The size and nature of the laboratory test sample shall be sufficient to overcome adequately the variability of the laboratory bulk sample[16].

2.4. Test specimen — The portion of material required to give an individual test result, and selected from the laboratory test sample.

3. PRINCIPLE

The laboratory test sample is selected so that it is representative of the laboratory bulk sample.

The test specimens are taken from the laboratory test sample in such a way that each of them is representative of the laboratory test sample.

4. SAMPLING FROM LOOSE FIBRES

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14 In some cases it is necessary to pre-treat the individual test specimen.

15 For made-up and finished articles see Section 7.

16 See point 1.

4.1. Unorientated fibres — Obtain the laboratory test sample by selecting tufts at random from the laboratory bulk sample. Mix thoroughly the whole of the laboratory test sample by means of a laboratory carder[17]. Subject the web or mixture, including loose fibres and fibres adhering to the equipment used for mixing, to pre-treatment. Then select test specimens, in proportion to the respective masses, from the web or mixture, from the loose fibres and from the fibres adhering to the equipment.

If the card web remains intact after pre-treatment, select the test specimens in the manner described in 4.2. If the card web is disturbed by the pre-treatment, select each test specimen by removing at random at least 16 small tufts of suitable and approximately equal size and then combine them.

4.2. Orientated fibres (cards, webs, slivers, rovings) — From randomly selected parts of the laboratory bulk sample cut not less than 10 crosssections each of mass approximately 1 g. Subject the laboratory test sample so formed to the pre-treatment. Recombine the cross-sections by laying them side by side and obtain the test specimen by cutting through them so as to take a portion of each of the 10 lengths.

5. SAMPLING YARN

5.1. Yarn in packages or in banks — Sample all the packages in the bulk laboratory sample.

Withdraw the appropriate continuous equal lengths from each package either by winding skeins of the same number of turns on a wrap-reel[18], or by some other means. Unite the lengths side by side either as a single skein or as a tow to form the laboratory test sample, ensuring that there are equal lengths from each package in the skein or tow.

Subject the laboratory test sample to the pre-treatment.

Take test specimens from the laboratory test sample by cutting a bunch of threads of equal length from the skein or tow, taking care to see that the bunch contains all the threads in the sample.

If the tex of the yarn is t and the number of packages selected from the laboratory bulk sample is n, then to obtain a test sample of 10 g, the length of yarn to be withdrawn from each package is 10^6/nt cm

If nt is high, i.e. more than 2 000, wind a heavier skein and cut it across in two places to make a tow of suitable mass. The ends of any sample in the form of a tow shall be securely tied before pre-treatment and test specimens taken from a place remote from the tie bands.

5.2. Yarn on warp — Take the laboratory test sample by cutting a length from the end of the warp, not less than 20 cm long and comprising all the yarns in the warp except the selvedge yarns, which are rejected. Tie the bunch of threads together near one end. If the sample is too large for pre-treatment as a whole divide it into two or more portions, each tied together for pre-treatment, and reunite the portions after each has been pre-treated separately. Take a test specimen by cutting a suitable length from the laboratory test sample from the end remote

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17 The laboratory carder may be replaced by a fibre blender, or the fibres may be mixed by the method of 'tufts and rejects'

18 If the packages can be mounted in a convenient creel a number can be wound simultaneously.

from the tie band, and comprising all the threads in the warp. For warp of N threads of tex t, the length of a specimen of mass 1 g is 10^5/Nt cm.

6. SAMPLING FABRIC

6.1. From a laboratory bulk sample consisting of a single cutting representative of the cloth

— Cut a diagonal strip from one corner to the other and remove the selvedges. This strip is the laboratory test sample. To obtain a laboratory test sample of x g, the strip area shall be $x10^4$/G cm^2.

where G is the mass of the cloth in g/m^2.

Subject the laboratory test sample to the pre-treatment and then cut the strip transversely into four equal lengths and superimpose them. Take test specimens from any part of the layered material by cutting through all the layers so that each specimen contains an equal length of each layer.

If the fabric has a woven design, make the width of the laboratory test sample, measured parallel to the warp direction, not less than one warp repeat of the design. If, with this condition satisfied, the laboratory test sample is too large to be treated as a whole, cut it into equal parts, pre-treat them separately, and superimpose these parts before selection of the test specimen, taking care that corresponding parts of the design do not coincide.

6.2. From a laboratory bulk sample consisting of several cuttings

— Treat each cutting as described in 6.1, and give each result separately.

7. SAMPLING MADE-UP AND FINISHED PRODUCTS

The bulk laboratory sample is normally a complete made-up or finished product or representative fraction of one.

Where appropriate determine the percentage of the various parts of the product not having the same fibre content, in order to check compliance with Article 13.

Select a laboratory test sample representative of the part of the made-up or finished product, whose composition must be shown by the label. If the product has several labels, select laboratory test samples representative of each part corresponding to a given label.

If the product whose composition is to be determined is not uniform, it may be necessary to select laboratory test samples from each of the parts of the product and to determine the relative proportions of the various parts in relation to the whole product in question.

Then calculate the percentages taking into account the relative proportions of the sampled parts.

Subject the laboratory test samples to the pre-treatment.

Then select test specimens representative of the pre-treated laboratory test samples.

II. Introduction to the methods for the quantitative analysis of textile fibre mixtures

Methods for the quantitative analysis of fibre mixtures are based on two main processes, the manual separation and the chemical separation of fibres.

The method of manual separation shall be used whenever possible since it generally gives more accurate results than the chemical method. It can be used for all textiles whose component fibres do not form an intimate mixture, as for example in the case of yarns composed of several elements each of which is made up of only one type of fibre, or fabrics in which the fibre of the warp is of a different kind to that of the weft, or knitted fabrics capable of being unravelled made up of yarns of different types.

In general, the methods of chemical quantitative analysis are based on the selective solution of the individual components. After the removal of a component the insoluble residue is weighed, and the proportion of the soluble component is calculated from the loss in mass. This first part of the Annex gives the information common to the analyses by this method of all fibre mixtures dealt with in the Annex, whatever their composition. It shall thus be used in conjunction with the succeeding individual sections of the Annex, which contain the detailed procedures applicable to particular fibre mixtures. Occasionally, an analysis is based on a principle other than selective solution; in such cases full details are given in the appropriate section.

Mixtures of fibres during processing and, to a lesser extent, finished textiles may contain non-fibrous matter, such as fats, waxes or dressings, or water-soluble matter, either occurring naturally or added to facilitate processing. Non-fibrous matter must be removed before analysis. For this reason a method for removing oils, fats, waxes and water-soluble matter is also given.

In addition, textiles may contain resins or other matter added to confer special properties. Such matter, including dyestuffs in exceptional cases, may interfere with the action of the reagent on the soluble component and/or it may be partially or completely removed by the reagent. This type of added matter may thus cause errors and shall be removed before the sample is analysed. If it is impossible to remove such added matter the methods for quantitative chemical analysis given in this Annex are no longer applicable.

Dye in dyed fabrics is considered to be an integral part of the fibre and is not removed.

Analyses are conducted on the basis of dry mass and a procedure is given for determining dry mass.

The result is obtained by applying to the dry mass of each fibre the agreed allowances listed in Annex IX to this Regulation.

Before proceeding with any analysis, all the fibres present in the mixture shall have been identified. In some methods, the insoluble component of a mixture may be partially dissolved in the reagent used to dissolve the soluble component(s).

Where possible, reagents have been chosen that have little or no effect on the insoluble fibres. If loss in mass is known to occur during the analysis, the result shall be corrected; correction factors for this purpose are given. These factors have been determined in several laboratories by treating, with the appropriate reagent as specified in the method of analysis, fibres cleaned by the pre-treatment.

These correction factors apply only to undegraded fibres and different correction factors may be necessary if the fibres have been degraded before or during processing. The procedures given apply to single determinations.

At least two determinations on separate test specimens shall be made, both in the case of manual separation and in the case of chemical separation.

For confirmation, unless technically impossible, it is recommended to use alternative procedures whereby the constituent that was the residue in the standard method is dissolved out first.

CHAPTER 2

Methods for quantitative analysis of certain binary fibre mixtures

I. General information common to the methods given for the quantitative chemical analysis of textile fibre mixtures

I.1. Scope and field of application

The field of application for each method specifies to which fibres the method is applicable.

I.2. Principle

After the identification of the components of a mixture, the non-fibrous material is removed by suitable pre-treatment and then one of the components, usually by selective solution[19]. The insoluble residue is weighed and the proportion of soluble component calculated from the loss in mass. Except where this presents technical difficulties, it is preferable to dissolve the fibre present in the greater proportion, thus obtaining the fibre present in the smaller proportion as residue.

I.3. Materials and equipment

I.3.1. Apparatus

I.3.1.1. Filter crucibles and weighing bottles large enough to contain such crucibles, or any other apparatus giving identical results.

I.3.1.2. Vacuum flask.

I.3.1.3. Desiccator containing self-indicating silica gel.

I.3.1.4. Ventilated oven for drying specimens at 105 ± 3 ºC.

I.3.1.5. Analytical balance, accurate to 0,0002 g.

I.3.1.6. Soxhlet extractor or other apparatus giving identical results.

I.3.2. Reagents

I.3.2.1. Light petroleum, redistilled, boiling range 40 to 60ºC.

I.3.2.2. Other reagents are specified in the appropriate sections of each method. All reagents used should be chemically pure.

I.3.2.3. Distilled or deionized water.

I.3.2.4. Acetone.

I.3.2.5. Orthophosphoric acid.

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[19] Method 12 is an exception. It is based on a determination of the content of a constituent substance of one of the two components.

I.3.2.6. Urea.

I.3.2.7. Sodium bicarbonate.

All reagents used shall be chemically pure.

I.4. Conditioning and testing atmosphere

Because dry masses are determined, it is unnecessary to condition the specimen or to conduct analyses in a conditioned atmosphere.

I.5. Laboratory test sample

Take a laboratory test sample that is representative of the laboratory bulk sample and sufficient to provide all the specimens, each of at least 1 g, that are required.

I.6. Pre-treatment of laboratory test sample[20]

Where a substance not to be taken into account in the percentage calculations (see Article 16) of this Regulation) is present, it shall first be removed by a suitable method that does not affect any of the fibre constituents.

For this purpose, non-fibrous matter which can be extracted with light petroleum and water is removed by treating the air-dry test sample in a Soxhlet extractor with light petroleum for one hour at a minimum rate of six cycles per hour. Allow the light petroleum to evaporate from the sample, which is then extracted by direct treatment consisting in soaking the specimen in water at room temperature for one hour and then soaking it in water at 65 ± 5 °C for a further hour, agitating the liquor from time to time. Use a liquor-specimen ratio of 100:1. Remove the excess water from the sample by squeezing, suction or centrifuging and then allow the sample to become air-dry.

In the case of elastolefin or fibre mixtures containing elastolefin and other fibres (wool, animal hair, silk, cotton, flax, true hemp, jute, abaca, alfa, coir, broom, ramie, sisal, cupro, modal, protein, viscose, acrylic, polyamide or nylon, polyester, elastomultiester) the procedure just described shall be slightly modified, in fact light petroleum ether shall be replaced by acetone.

In the case of binary mixtures containing elastolefin and acetate the following procedure shall apply as pre-treatment. Extract the specimen for 10 minutes at 80 °C with a solution containing 25 g/l of 50 % orthophosphoric acid and 50 g/l of urea. Use a liquor-specimen ratio of 100:1. Wash the specimen in water, then drain and wash it in a 0,1 % sodium bicarbonate solution, finally wash it carefully in water.

Where non-fibrous matter cannot be extracted with light petroleum and water, it shall be removed by substituting for the water method described above a suitable method that does not substantially alter any of the fibre constituents. However, for some unbleached, natural vegetable fibres (e.g. jute, coir) it is to be noted that normal pre-treatment with light petroleum and water does not remove all the natural non-fibrous substances; nevertheless

[20] See Chapter 1.1

additional pre-treatment is not applied unless the sample does contain finishes insoluble in both light petroleum and water.

Analysis reports shall include full details of the methods of pre-treatment used.

I.7. Test procedure

I.7.1. General instructions

I.7.1.1. D r y i n g

Conduct all drying operations for not less than four hours and not more than 16 hours at 105 ± 3 ºC in a ventilated oven with the oven door closed throughout. If the drying period is less than 14 hours, the specimen must be weighed to check that its mass has become constant. The mass may be considered to have become constant if, after a further drying period of 60 minutes, its variation is less than 0,05 %.

Avoid handling crucibles and weighing bottles, specimens or residues with bare hands during the drying, cooling and weighing operations.

Dry specimens in a weighing bottle with its cover beside it. After drying, stopper the weighing bottle before removing it from the oven, and transfer it quickly to the desiccator.

Dry the filter crucible in a weighing bottle with its cover beside it in the oven. After drying, close the weighing bottle and transfer it quickly to the desiccator.

Where apparatus other than a filter crucible is used, drying operations in the oven shall be conducted in such a way as to enable the dry mass of the fibres to be determined without loss.

I.7.1.2. C o o l i n g

Conduct all cooling operations in the desiccator the latter placed beside the balance, until complete cooling of the weighing bottles is attained, and in any case for not less than two hours.

I.7.1.3. We i g h i n g

After cooling, complete the weighing of the weighing bottle within two minutes of its removal from the desiccator. Weigh to an accuracy of 0,0002 g.

I.7.2. Procedure

Take from the pre-treated laboratory test sample a test specimen weighing at least 1 g. Cut yarn or cloth into lengths of about 10 mm, dissected as much as possible. Dry the specimen in a weighing bottle, cool it in the desiccator and weigh it. Transfer the specimen to the glass vessel specified in the appropriate section of the relevant Community method, reweigh the weighing bottle immediately and obtain the dry mass of the specimen by difference. Complete the test as specified in the appropriate section of the applicable method. Examine the residue microscopically to check that the treatment has in fact completely removed the soluble fibre.

I.8. Calculation and expression of results

Express the mass of the insoluble component as a percentage of the total mass of fibre in the mixture. The percentage of soluble component is obtained by difference. Calculate the results on the basis of clean, dry mass, adjusted by (a) the agreed allowances and (b) the correction factors necessary to take account of loss of matter during pre-treatment and analysis. Calculations shall be made by applying the formula given in I.8.2.

I.8.1. Calculation of percentage of insoluble component on clean, dry mass basis, disregarding loss of fibre mass during pre-treatment.

$$P_1\% = \frac{100\ rd}{m}$$

where

P1% is the percentage of clean, dry insoluble component,

m is the percentage of dry mass of the test specimen after pre-treatment,

r is the dry mass of the residue,

d is the correction factor for loss in mass of the insoluble component in the reagent during the analysis. Suitable values for "d" are given in the relevant section of each method.

Of course, these values for “d” are the normal values applicable to chemically undegraded fibres.

I.8.2. Calculation of percentage of insoluble component on clean, dry mass basis, with adjustment by conventional factors and, where appropriate, correction factors for loss of mass during pre-treatment.

$$P_{1A}\% = \frac{100\,P_1\left(1+\frac{(a_1+b_1)}{100}\right)}{P_1\left(1+\frac{a_1+b_1}{100}\right)+(100-P_1)\left(1+\frac{a_2+b_2}{100}\right)}$$

where

P_{1A}% is the percentage of insoluble component adjusted by conventional agreed allowances and for loss in mass during pre-treatment.

P_1 is the percentage of clean dry insoluble component as calculated from the formula shown in I.8.1.

a_1 is the conventional agreed allowance for the insoluble component (see Annex IX)

a_2 is the conventional agreed allowance for the soluble component (see Annex IX)

b_1 is the percentage loss of insoluble component caused by pre-treatment

b_2 is the percentage loss of soluble component caused by pre-treatment

The percentage of the second component is $P_{2A}\% = 100 - P_{1A}\%$

Where a special pre-treatment has been used, the values of b_1 and b_2 shall be determined, if possible, by submitting each of the pure fibre constituents to the pre-treatment applied in the analysis. Pure fibres are those free from all non-fibrous material except that which they normally contain (either naturally or because of the manufacturing process), in the state (unbleached, bleached) in which they are found in the material to be analysed.

Where no clean separate constituent fibres used in the manufacture of the material to be analysed are available, average values of b_1 and b_2 as obtained from tests performed on clean fibres similar to those in the mixture under examination, shall be used.

If normal pre-treatment by extraction with light petroleum and water is applied, correction factors b_1 and b_2 may generally be ignored, except in the case of unbleached cotton, unbleached flax and unbleached hemp, where the loss due to the pre-treatment is conventionally taken as 4 %, and in the case of polypropylene, where it is taken as 1 %.

In the case of other fibres, losses due to the pre-treatment are conventionally disregarded in calculations.

II. Method of quantitative analysis by manual separation

II.1. Field of application

This method is applicable to textile fibres of all types provided they do not form an intimate mixture and that it is possible to separate them by hand.

II.2. Principle

After identification of the constituents of the textile, the non-fibrous material is removed by suitable pre-treatment and then the fibres are separated by hand, dried and weighed in order to calculate the proportion of each fibre in the mixture.

II.3. Apparatus

II.3.1. Weighing bottle or any other apparatus giving identical results.

II.3.2. Desiccator containing self-indicating silica gel.

II.3.3. Ventilated oven for drying specimens at 105 ± 3 ºC.

II.3.4. Analytical balance, accurate to 0,0002 g.

II.3.5. Soxhlet extractor, or other apparatus giving an identical result.

II.3.6. Needle.

II.3.7. Twist tester or similar apparatus.

II.4. Reagents

II.4.1. Light petroleum, redistilled, boiling range 40 to 60 ºC.

II.4.2. Distilled or deionized water.

II.5. Conditioning and testing atmosphere

See I.4.

II.6. Laboratory test sample

See I.5.

II.7. Pre-treatment of laboratory test sample

See I.6.

II.8. Procedure

II.8.1. Analysis of yarn

Select from the pre-treatment laboratory test sample a specimen of mass not less than 1 g. For a very fine yarn, the analysis may be made on a minimum length of 30 m, whatever its mass.

Cut the yarn into pieces of a suitable length and separate the fibre types by means of a needle and, if necessary, a twist tester. The fibre types so obtained are placed in pre-weighed weighing bottles and dried at 105 ± 3 ºC until a constant mass is obtained, as described in I.7.1 and I.7.2.

II.8.2. Analysis of cloth

Select from the pre-treated laboratory test sample, well away from all selvedges, a specimen of mass not less than 1 g, with edges carefully trimmed to avoid fraying and running parallel with weft or warp yarns, or in the case of knitted fabrics in the line of wales and courses. Separate the different fibre types, collect them in pre-weighed weighing bottles and proceed as described in II.8.1.

II.9. Calculation and expression of results

Express the mass of each fibre constituent as a percentage of the total mass of the fibres in the mixture. Calculate the results on the basis of clean, dry mass, adjusted by (a) the agreed allowances and (b) the correction factors necessary to take account of loss of matter during pre-treatment.

II.9.1. Calculation of percentage masses of clean, dry fibre, disregarding loss of fibre mass during pre-treatment:

$$P_1\% = \frac{100\, m_1}{m_1 + m_2} = \frac{100}{1 + \frac{m_2}{m_1}}$$

P_1% is the percentage of the first clean, dry component,

m_1 is the clean, dry mass of the first component,

m_2 is the clean, dry mass of the second component.

II.9.2. For calculation of the percentage of each component with adjustment by agreed allowances and, where appropriate, by correction factors for loss of matter during pre-treatment, see I.8.2.

III.1. Precision of the methods

The precision indicated in individual methods relates to the reproducibility.

The reproducibility refers to the reliability, i.e. the closeness of agreement between experimental values obtained by operators in different laboratories or at different times using the same method and obtaining individual results on specimens of an identical consistent mixture.

The reproducibility is expressed by confidence limits of the results for a confidence level of 95 %.

Therefore, the difference between two results in a series of analyses made in different laboratories would, given a normal and correct application of the method to an identical and consistent mixture, be exceeded only in five cases out of a 100.

III.2. Test report

III.2.1. State that the analysis was conducted in accordance with this method.

III.2.2. Give details of any special pre-treatment (see I.6).

III.2.3. Give the individual results and the arithmetic mean, each to an accuracy of 0,1.

IV. Special methods

SUMMARY TABLE

Method	Field of application		Reagent
	Soluble component	Insoluble component	
1.	Acetate	Certain other fibres	Acetone
2.	Certain protein fibres	Certain other fibres	Hypochlorite
3.	Viscose, cupro or certain types of modal	Cotton, elastolefin or melamine	Formic acid and zinc chloride
4.	Polyamide or nylon	Certain other fibres	Formic acid, 80% m/m
5.	Acetate	Triacetate, elastolefin or melamine	Benzyl alcohol
6.	Triacetate or polylactide	Certain other fibres	Dichloromethane

7.	Certain cellulose fibres	Polyester, elastomultiester or elastolefin	Sulphuric acid, 75% m/m
8.	Acrylics, certain modacrylics or certain chlorofibres	Certain other fibres	Dimethylformamide
9.	Certain chlorofibres	Certain other fibres	Carbon disulphide/acetone, 55,5/44,5 v/v
10.	Acetate	Certain chlorofibres, elastolefin or melamine	Glacial acetic acid
11.	Silk	Wool, hair, elastolefin or melamine	Sulphuric acid, 75% m/m
12.	Jute	Certain animal fibres	Nitrogen content method
13.	Polypropylene	Certain other fibres	Xylene
14.	Certain other fibres	Chlorofibres (homopolymers of vinyl chloride), elastolefin or melamine	Concentrated sulphuric acid method
15.	Chlorofibres, certain modacrylics, certain elastanes, acetates, triacetates	Certain other fibres	Cyclohexanone
16.	Melamine	Cotton or aramid	Hot formic acid, 90%m/m

METHOD No 1

ACETATE AND CERTAIN OTHER FIBRES

(Acetone method)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. acetate (19)

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), flax (7) true hemp (8), jute (9), abaca (10), alfa (11), coir (12), broom (13), ramie (14), sisal (15), cupro (21), modal (22), protein (23), viscose (25), acrylic (26), polyamide or nylon (30), polyester (35) elastomultiester (46), elastolefin (47) and melamine (48).

In no circumstances is the method applicable to acetate fibres which have been deacetylated on the surface.

2. PRINCIPLE

The acetate is dissolved out from a known dry mass of the mixture, with acetone. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry acetate is found by difference.

3. APPARATUS AND REAGENTS (additional to those specified in the general instructions)

3.1. Apparatus

Glass-stoppered conical flasks of at least 200 ml capacity.

3.2. Reagent

Acetone.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in a glass-stoppered conical flask of at least 200 ml capacity, add 100 ml of acetone per gram of specimen, shake the flask, stand it for 30 minutes at room temperature, stirring from time to time, and then decant the liquid through the weighed filter crucible.

Repeat the treatment twice more (making three extractions in all), but for periods of 15 minutes only, so that the total time of treatment in acetone is one hour. Transfer the residue to the filter crucible. Wash the residue in the filter crucible with acetone and drain with suction. Refill the crucible with acetone and allow to drain under gravity.

Finally, drain the crucible with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except for melamine, for which ‘d’=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 2

CERTAIN PROTEIN FIBRES AND CERTAIN OTHER FIBRES

(Method using hypochlorite)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. certain protein fibres, namely: wool (1), animal hair (2 and 3), silk (4), protein (23)

with

2. cotton (5), cupro (21), viscose (25), acrylic (26), chlorofibres (27), polyamide or nylon (30), polyester (35), polypropylene (37), elastane (43), glass fibre (44) elastomultiester (46), elastolefin (47) and melamine (48).

If different protein fibres are present, the method gives the total of their amounts but not their individual quantities.

2. PRINCIPLE

The protein fibre is dissolved out from a known dry mass of the mixture, with a hypochlorite solution. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry protein fibre is found by difference.

Either lithium hypochlorite or sodium hypochlorite can be used for the preparation of the hypochlorite solution.

Lithium hypochlorite is recommended in cases involving a small number of analyses or for analyses conducted at fairly lengthy intervals. This is because the percentage of hypochlorite in solid lithium hypochlorite — unlike that in sodium hypochlorite — is virtually constant. If the percentage of hypochlorite is known, hypochlorite content need not be checked iodometrically for each analysis, since a constant weighed portion of lithium hypochlorite can be employed.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Erlenmeyer flask with ground-glass stopper, 250 ml;

(ii) thermostat, adjustable to 20 (± 2) ºC.

3.2. Reagents

(i) *Hypochlorite reagent*

(a) L i t h i u m h y p o c h l o r i t e s o l u t i o n

This consists of a freshly prepared solution containing 35 (± 2) g/l of active chlorine (approximately 1 M), to which 5 (± 0,5) g/l of previously dissolved sodium hydroxide is added. To prepare, dissolve 100 grams of lithium hypochlorite containing 35 % active chlorine (or 115 grams containing 30 % active chlorine) in approximately 700 ml of distilled water, add 5 grams of sodium hydroxide dissolved in approximately 200 ml of distilled water and make up to 1 litre with distilled water. The solution which has been freshly prepared need not be checked iodometrically.

(b) S o d i um h y p o c h l o r i t e s o l u t i o n

This consists of a freshly prepared solution containing 35 (± 2) g/l of active chlorine (approximately 1 M) to which 5 (± 0,5) g/l of previously dissolved sodium hydroxide is added.

Check the active chlorine content of the solution iodometrically before each analysis.

(ii) *Acetic acid, dilute solution*

Dilute 5 ml of glacial acetic acid to 1 litre with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows: mix approximately 1 gram of the sample with approximately 100 ml of the hypochlorite solution (lithium or sodium hypochlorite) in the 250 ml flask and agitate thoroughly in order to wet out the sample.

Then heat the flask for 40 minutes in a thermostat at 20 ºC and agitate continuously, or at least at regular intervals. Since the dissolution of the wool proceeds exothermically, the reaction heat of this method must be distributed and removed. Otherwise, considerable errors may be caused by the incipient dissolution of the non-soluble fibres.

After 40 minutes, filter the flask contents through a weighed glass-filter crucible and transfer any residual fibres into the filter crucible by rinsing the flask with a little hypochlorite reagent. Drain the crucible with suction and wash the residue successively with water, dilute acetic acid, and finally water, draining the crucible with suction after each addition. Do not apply suction until each washing liquor has drained under gravity.

Finally, drain the crucible with suction, dry the crucible with the residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except for cotton, viscose, modal and melamine for which ‘d’ = 1,01, and unbleached cotton, for which ‘d’ = 1,03.

6. PRECISION

On homogeneous mixtures of textile materials, the confidence limits for results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 3

VISCOSE, CUPRO OR CERTAIN TYPES OF MODAL AND COTTON

(Method using formic acid and zinc chloride)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. viscose (25) or cupro (21), including certain types of modal fibre (22),

with

2. cotton (5), elastolefin (47) and melamine (48).

If a modal fibre is found to be present, a preliminary test shall be carried out to see whether it is soluble in the reagent.

This method is not applicable to mixtures in which the cotton has suffered extensive chemical degradation nor when the viscose or cupro is rendered incompletely soluble by the presence of certain dyes or finishes that cannot be removed completely.

2. PRINCIPLE

The viscose, cupro or modal fibre is dissolved from a known dry mass of the mixture, with a reagent consisting of formic acid and zinc chloride. The residue is collected, washed, dried and weighed; its corrected mass is expressed as a percentage of the dry mass of the mixture. The percentage of dry viscose, cupro or modal fibre is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) glass-stoppered conical flasks of at least 200 ml capacity;

(ii) apparatus for maintaining flasks at 40 (± 2) ºC.

3.2. Reagents

(i) Solution containing 20 g of fused anhydrous zinc chloride and 68 g of anhydrous formic acid made up to 100 g with water (namely 20 parts by mass of fused anhydrous zinc chloride to 80 parts by mass of 85 % m/m formic acid).

NB:

Attention is drawn, in this respect, to point I.3.2.2, which lays down that all reagents used shall be chemically pure; in addition, it is essential to use only fused anhydrous zinc chloride.

(ii) Ammonium hydroxide solution: dilute 20 ml of a concentrated ammonia solution (specific gravity 0,880 g/ml) to 1 litre with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows: place the specimen immediately in the flask, pre-heated to 40 ºC. Add 100 ml of the solution of formic acid and zinc chloride, pre-heated to 40 ºC per gram of specimen. Insert the stopper and shake the flask vigorously. Keep the flask and its contents at a constant temperature of 40 ºC for two hours and a half, shaking the flask at hourly intervals.

Filter the contents of the flask through the weighed filter crucible and with the help of the reagent transfer to the crucible any fibres remaining in the flask. Rinse with 20 ml of reagent.

Wash crucible and residue thoroughly with water at 40 ºC. Rinse the fibrous residue in approximately 100 ml of cold ammonia solution (3.2.ii) ensuring that this residue remains wholly immersed in the solution for 10 minutes (1); then rinse thoroughly with cold water.

Do not apply suction until each washing liquor has drained under gravity.

Finally, drain the remaining liquid with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,02 for cotton ,1,01 for melamine and 1,00 for elastolefin.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 2 for a confidence level of 95 %.

METHOD No 4

POLYAMIDE OR NYLON, AND CERTAIN OTHER FIBRES

(Method using 80 % m/m formic acid)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. polyamide or nylon, (30),

with

2. wool (1), animal hair (2 and 3), cotton (5), cupro (21), modal (22), viscose (25), acrylic (26), chlorofibre (27), polyester (35), polypropylene (37), glass fibre (44), elastomultiester (46), elastolefin (47) and melamine (48).

As mentioned above, this method is also applicable to mixtures with wool, but when the wool content exceeds 25 %, method No 2 shall be applied (dissolving wool in a solution of alkaline sodium hypochlorite).

2. PRINCIPLE

The polyamide fibre is dissolved out from a known dry mass of the mixture, with formic acid. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry polyamide or nylon is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

Glass-stoppered conical flask of at least 200 ml capacity.

3.2. Reagents

(i) Formic acid (80 % m/m, relative density at 20 ºC: 1,186). Dilute 880 ml of 90 % m/m formic acid (relative density at 20 ºC: 1,204) to 1 litre with water. Alternatively, dilute 780 ml of 98 to 100 % m/m formic acid (relative density at 20 ºC: 1,220) to 1 litre with water.

The concentration is not critical within the range 77 to 83 % m/m formic acid.

(ii) Ammonia, dilute solution: dilute 80 ml of concentrated ammonia solution (relative density at 20 ºC: 0,880) to 1 litre with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows: to the specimen contained in the conical flask of at least 200 ml capacity, add 100 ml of formic acid per gram of specimen. Insert the stopper, shake the flask to wet out the specimen. Stand the flask for 15 minutes at room temperature, shaking it at intervals. Filter the contents of the

flask through the weighed filter crucible and transfer any residual fibres to the crucible by washing out the flask with a little formic acid reagent.

Drain the crucible with suction and wash the residue on the filter successively with formic acid reagent, hot water, dilute ammonia solution, and finally cold water, draining the crucible with suction after each addition. Do not apply suction until each washing liquor has drained under gravity.

Finally, drain the crucible with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except for melamine, for which ‘d’=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 5

ACETATE AND TRIACETATE

(Method using benzyl alcohol)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

— acetate (19)

with

— triacetate (24), elastolefin (47) and melamine (48).

2. PRINCIPLE

The acetate fibre is dissolved out from a known dry mass of the mixture, with benzyl alcohol at 52 ± 2 ºC.

The residue is collected, washed, dried and weighed; its mass is expressed as a percentage of the dry mass of the mixture. The percentage of dry acetate is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Mechanical shaker.

(iii) Thermostat or other apparatus for keeping the flask at a temperature of 52 ± 2 ºC.

3.2. Reagents

(i) Benzyl alcohol,

(ii) Ethanol.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the conical flask, add 100 ml of benzyl alcohol per gram of specimen. Insert the stopper, secure the flask to the shaker so that it is immersed in the water-bath, kept at 52 ± 2 ºC, and shake for 20 minutes at this temperature.

(Instead of using a mechanical shaker, the flask may be shaken vigorously by hand).

Decant the liquid through the weighed filter crucible. Add a further dose of benzyl alcohol in the flask and shake as before at 52 ± 2 ºC for 20 minutes.

Decant the liquid through the crucible. Repeat the cycle of operations a third time.

Finally pour the liquid and the residue into the crucible; wash any remaining fibres from the flask into the crucible with an extra quantity of benzyl alcohol at 52 ± 2 ºC. Drain the crucible thoroughly.

Transfer the fibres into a flask, rinse with ethanol and after shaking manually decant through the filter crucible.

Repeat this rinsing operation two or three times. Transfer the residue into the crucible and drain thoroughly. Dry the crucible and the residue and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except for melamine, for which ‘d’=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 6

TRIACETATES AND CERTAIN OTHER FIBRES

(Method using dichloromethane)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. triacetate (24) or polylactide (34)

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), (21), modal (22), viscose (25), acrylic (26), polyamide or nylon (30), polyester (35), glass fibre (44) elastomultiester (46), elastolefin (47) and melamine (48).

Note

Triacetate fibres which have received a finish leading to partial hydrolysis cease to be completely soluble in the reagent. In such cases, the method is not applicable.

2. PRINCIPLE

The triacetate or polylactide fibres are dissolved out from a known dry mass of the mixture, with dichloromethane. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry triacetate or polylactide is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

Glass-stoppered conical flask of at least 200 ml capacity.

3.2. Reagent

Dichloromethane.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the 200 ml glass-stoppered conical flask, add 100 ml of dichloromethane per gram of specimen, insert the stopper, shake the flask every 10 minutes to wet out the specimen and stand for 30 minutes at room temperature, shaking the flask at regular intervals. Decant the liquid through the weighed filter crucible. Add 60 ml of dichloromethane to the flask containing the residue, shake manually and filter the contents of the flask through the filter crucible. Transfer the residual fibres to the crucible by washing out the flask with a little more dichloromethane. Drain the crucible with suction to remove excess liquid, refill the crucible with dichloromethane and allow it to drain under gravity.

Finally, apply suction to eliminate excess liquid, then treat the residue with boiling water to eliminate all the solvent, apply suction, dry the crucible and residue, cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except in the case of polyester, elastomultiester, elastolefin and melamine for which the value of ‘d’ is 1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 7

CERTAIN CELLULOSE FIBRES AND POLYESTER

(Method using 75 % m/m sulphuric acid)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. cotton (5), flax (7), true hemp (8), ramie (14), cupro (21), modal (22), viscose (25)

with

2. polyester (35), elastomultiester (46) and elastolefin (47).

2. PRINCIPLE

The cellulose fibre is dissolved out from a known dry mass of the mixture, with 75 % m/m sulphuric acid. The residue is collected, washed, dried and weighed; its mass is expressed as a percentage of the dry mass of the mixture. The proportion of dry cellulose fibre is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 500 ml capacity.

(ii) Thermostat or other apparatus for maintaining the flask at 50 ± 5 ºC.

3.2. Reagents

(i) Sulphuric acid, 75 ± 2 % m/m

Prepare by adding carefully, while cooling, 700 ml of sulphuric acid (relative density at 20 ºC: 1,84) to 350 ml of distilled water.

After the solution has cooled to room temperature, dilute to 1 litre with water.

(ii) Ammonia, dilute solution

Dilute 80 ml of ammonia solution (relative density at 20 ºC: 0,88) to 1 litre with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the glass-stoppered conical flask of at least 500 ml capacity, add 200 ml of 75 % sulphuric acid per gram of specimen, insert the stopper and carefully shake the flask to wet out the specimen.

Maintain the flask at 50 ± 5 ºC for one hour, shaking it at regular intervals of roughly 10 minutes. Filter the contents of the flask through the weighed filter crucible by means of suction. Transfer any residual fibres by washing out the flask with a little 75 % sulphuric acid. Drain the crucible with suction and wash the residue on the filter once by filling the crucible with a fresh portion of sulphuric acid. Do not apply suction until the acid has drained under gravity.

Wash the residue successively several times with cold water, twice with dilute ammonia solution, and then thoroughly with cold water, draining the crucible with suction after each addition. Do not apply suction until each washing liquor has drained under gravity. Finally, drain the remaining liquid from the crucible with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 8

ACRYLICS, CERTAIN MODACRYLICS OR CERTAIN CHLOROFIBRES AND CERTAIN OTHER FIBRES

(Method using dimethylformamide)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. acrylics (26), certain modacrylics (29), or certain chlorofibres (27) [21]

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), cupro (21), modal

(22), viscose (25), polyamide or nylon (30), polyester (35), elastomultiester

(46), elastolefin (47) and melamine (48).

It is equally applicable to acrylics, and certain modacrylics, treated with premetallised dyes, but not to those dyed with afterchrome dyes.

2. PRINCIPLE

The acrylic, modacrylic or chlorofibre is dissolved out from a known dry mass of the mixture, with dimethylformamide heated in a water-bath at boiling point. The residue is collected, washed, dried and weighed. Its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture and the percentage of dry acrylic, modacrylic or chlorofibre is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Water bath at boiling point.

3.2. Reagent

Dimethylformamide (boiling point 153 ± 1 ºC) not containing more than 0,1 % water.

This reagent is toxic and the use of a hood is thus recommended.

4. TEST PROCEDURE

---

[21] The solubility of such modacrylics or chlorofibres in the reagent shall be checked before carrying out the analysis.

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the glass-stoppered conical flask of at least 200 ml capacity, add per gram of specimen 80 ml of dimethylformamide, pre-heated in the water-bath at boiling point, insert the stopper, shake the flask to wet out the specimen and heat in the water-bath at boiling point for one hour. Shake the flask and its contents gently by hand five times during this period.

Decant the liquid through the weighed filter crucible, retaining the fibres in the flask. Add a further 60 ml of dimethylformamide to the flask and heat for a further 30 minutes, shaking the flask and contents gently by hand twice during this period.

Filter the contents of the flask through the filter crucible by means of suction.

Transfer any residual fibre to the crucible by washing out the beaker with dimethylformamide. Drain the crucible with suction. Wash the residue with about 1 litre of hot water at 70 — 80 ºC, filling the crucible each time.

After each addition of water, apply suction briefly but not until the water has drained under gravity. If the washing liquor drains through the crucible too slowly slight suction may be applied.

Finally dry the crucible with the residue, cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00 except in the following cases:

wool 1,01

cotton 1,01

cupro 1,01

modal 1,01

polyester 1,01

elastomultiester 1,01

melamine 1,01

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 9

CERTAIN CHLOROFIBRES AND CERTAIN OTHER FIBRES

(Method using 55,5/44,5 mixture of carbon disulphide and acetone)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. certain chlorofibres (27), namely certain polyvinyl chloride fibres, whether after-chlorinated or not [22]

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), cupro (21), modal (22), viscose (25), acrylic (26), polyamide or nylon (30), polyester (35), glass fibre (44), elastomultiester (46) and melamine (48).

When the wool or silk content of the mixture exceeds 25 %, method No 2 shall be used.

When the polyamide or nylon content of the mixture exceeds 25 %, method No 4 shall be used.

2. PRINCIPLE

The chlorofibre is dissolved out from a known dry mass of the mixture, with an azeotropic mixture of carbon disulphide and acetone. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry polyvinyl chloride fibre is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Mechanical shaker.

3.2. Reagents

(i) Azeotropic mixture of carbon disulphide and acetone (55,5 % by volume carbon disulphide to 44,5 % acetone). As this reagent is toxic, the use of a hood is recommended.

(ii) Ethanol (92 % by volume) or methanol.

4. TEST PROCEDURE

[22] Before carrying out the analysis, the solubility of the polyvinyl chloride fibres in the reagent shall be checked.

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the glass-stoppered conical flask of at least 200 ml capacity, add 100 ml of the azeotropic mixture per gram of specimen. Seal the flask securely, and shake the flask on a mechanical shaker, or vigorously by hand, for 20 minutes at room temperature.

Decant the supernatant liquid through the weighed filter crucible.

Repeat the treatment with 100 ml of fresh reagent. Continue this cycle of operations until no polymer deposit is left on a watch glass when a drop of the extraction liquid is evaporated. Transfer the residue to the filter crucible using more reagent, apply suction to remove the liquid, and rinse the crucible and residue with 20 ml of alcohol and then three times with water. Allow the washing liquor to drain under gravity before draining with suction. Dry the crucible and residue and cool and weigh them.

Note:

With certain mixtures having a high chlorofibre content there may be substantial shrinkage of the specimen during the drying procedure, as a result of which the dissolution of chlorofibre by the solvent is retarded.

This does not, however, affect the ultimate dissolution of the chlorofibre in the solvent.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00, except for melamine, for which ‘d’=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of the results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 10

ACETATE AND CERTAIN CHLOROFIBRES

(Method using glacial acetic acid)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. acetate (19)

with

2. certain chlorofibres (27) namely polyvinyl chloride fibres, whether afterchlorinated

or not, elastolefin (47) and melamine (48).

2. PRINCIPLE

The acetate fibre is dissolved out from a known dry mass of the mixture, with glacial acetic acid. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry acetate is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Mechanical shaker.

3.2. Reagent

Glacial acetic acid (over 99 %). This reagent shall be handled with care since it is highly caustic.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

To the specimen contained in the glass-stoppered conical flask of at least 200 ml capacity, add 100 ml glacial acetic acid per gram of specimen. Seal the flask securely and shake on the mechanical shaker, or vigorously by hand, for 20 minutes at room temperature. Decant the supernatant liquid through the weighed filter crucible. Repeat this treatment twice, using 100 ml of fresh reagent each time, making three extractions in all.

Transfer the residue to the filter crucible, drain with suction to remove the liquid and rinse the crucible and the residue with 50 ml of glacial acetic acid, and then three times with water. After each rinse, allow the liquid to drain under gravity before applying suction. Dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of the results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 11

SILK AND WOOL OR HAIR

(Method using 75 % m/m sulphuric acid)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. silk (4)

with

2. wool (1), animal hair (2 and 3), elastolefin (47) and melamine (48).

2. PRINCIPLE

The silk fibre is dissolved out from a known dry mass of the mixture, with 75 % m/m sulphuric acid [23].

The residue is collected, washed, dried and weighed. Its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of dry silk is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

Glass-stoppered conical flask of at least 200 ml capacity.

3.2. Reagents

(i) Sulphuric acid (75 ± 2 % m/m)

Prepare by adding carefully, while cooling, 700 ml sulphuric acid (density at 20 ºC: 1,84) to 350 ml distilled water.

After cooling to room temperature, dilute the solution to 1 litre with water.

(ii) Sulphuric acid, dilute solution: add 100 ml sulphuric acid (density at 20 ºC: 1,84) slowly to 1 900 ml distilled water.

(iii) Ammonia, dilute solution: dilute 200 ml concentrated ammonia (density at 20 ºC: 0,880) to 1 000 ml with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and proceed as follows:

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[23] Wild silks, such as tussah silk, are not completely soluble in 75 % m/m sulphuric acid

To the specimen contained in a glass-stoppered conical flask of at least 200 ml capacity, add 100 ml of 75 % m/m sulphuric acid per gram of specimen and insert the stopper. Shake vigorously and stand for 30 minutes at room temperature. Shake again and stand for 30 minutes.

Shake a last time and filter the contents of the flask through the weighed filter crucible. Wash any remaining fibres from the flask with the 75 % sulphuric acid reagent. Wash the residue on the crucible successively with 50 ml of the dilute sulphuric acid reagent, 50 ml water and 50 ml of the dilute ammonia solution. Each time allow the fibres to remain in contact with the liquid for about 10 minutes before applying suction. Finally rinse with water, leaving the fibres in contact with the water for about 30 minutes.

Drain the crucible with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 0,985 for wool, 1,00 for elastolefin and 1,01 for melamine.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 12

JUTE AND CERTAIN ANIMAL FIBRES

(Method by determining nitrogen content)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. jute (9)

with

2. certain animal fibres.

The animal-fibre component may consist solely of hair (2 and 3) or wool (1) or of any mixture of the two. This method is not applicable to textile mixtures containing non-fibrous matter (dyes, finishes, etc.) with a nitrogen base.

2. PRINCIPLE

The nitrogen content of the mixture is determined, and from this and the known or assumed nitrogen contents of the two components, the proportion of each component is calculated.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Kjeldahl digestion flask, 200 — 300 ml capacity.

(ii) Kjeldahl distillation apparatus with steam injection.

(iii) Titration apparatus, allowing precision of 0,05 ml.

3.2. Reagents

(i) Toluene.

(ii) Methanol.

(iii) Sulphuric acid, relative density at 20 ºC: 1,84 (1).

(iv) Potassium sulphate (1).

(v) Selenium dioxide (1).

(vi) Sodium hydroxide solution (400 g/litre). Dissolve 400 g of sodium hydroxide in 400 — 500 ml of water and dilute to 1 litre with water.

(vii) Mixed indicator. Dissolve 0,1 g of methyl red in 95 ml of ethanol and 5 ml of water, and mix with 0,5 g of bromocresol green dissolved in 475 ml of ethanol and 25 ml of water.

(viii) Boric acid solution. Dissolve 20 g of boric acid in 1 litre of water.

(ix) Sulphuric acid, 0,02N (standard volumetric solution).

4. PRE-TREATMENT OF TEST SAMPLE

The following pre-treatment is substituted for the pre-treatment described in the general instructions:

Extract the air-dry sample in a Soxhlet apparatus with a mixture of 1 volume of toluene and 3 volumes of methanol for four hours at a minimum rate of 5 cycles per hour. Allow the solvent to evaporate from the sample in air, and remove the last traces in an oven at 105 ± 3 ºC. Then extract the sample in water (50 ml per g of sample) by boiling under reflux for 30 minutes. Filter, return the sample to the flask, and repeat the extraction with an identical volume of water. Filter, remove excess water from the sample by squeezing, suction, or centrifuging and then allow the sample to become air-dry.

Note:

The toxic effects of toluene and methanol shall be borne in mind and full precautions shall be taken in their use.

5. TEST PROCEDURE

5.1. General instructions

Follow the procedure described in the general instructions as regards the selection, drying and weighing of the specimen.

5.2. Detailed procedure

Transfer the specimen to a Kjeldahl digestion flask. To the specimen weighing at least 1 g contained in the digestion flask, add, in the following order, 2,5 g potassium sulphate, 0,1 — 0,2 g selenium dioxide and 10 ml sulphuric acid (relative density 1,84). Heat the flask, gently at first, until the whole of the fibre is destroyed, and then heat it more vigorously until the solution becomes clear and almost colourless. Heat it for a further 15 minutes. Allow the flask to cool, dilute the contents carefully with 10 — 20 ml water, cool, transfer the contents quantitatively to a 200 ml graduated flask and make up to volume with water to form the digest solution. Place about 20 ml of boric acid solution in a 100 ml conical flask and place the flask under the condenser of the Kjeldahl distillation apparatus so that the delivery tube dips just below the surface of the boric acid solution. Transfer exactly 10 ml of digest solution to the distillation flask, add not less than 5 ml of sodium hydroxide solution to the funnel, lift the stopper slightly and allow the sodium hydroxide solution to run slowly into the flask. If the digest solution and sodium hydroxide solution remain as two separate layers, mix them by gentle agitation. Heat the distillation flask gently and pass it into steam from the generator. Collect about 20 ml of distillate, lower the conical flask so that the tip of the delivery tube of the condenser is about 20 mm above the surface of the liquid and distil for 1 minute more. Rinse the tip of the delivery tube with water, catching the washings in the conical flask. Remove the conical flask and replace it with another conical flask containing roughly 10 ml of boric acid solution and collect about 10 ml distillate.

Titrate the two distillates separately with 0,02N sulphuric acid, use the mixed indicator. Record the total titre for the two distillates. If the titre for the second distillate is more than 0,2 ml, repeat the test and start the distillation again using a fresh aliquot of digest solution.

Carry out a blank determination, i.e. digestion and distillation using the reagents only.

6. CALCULATION AND EXPRESSION OF RESULTS

6.1. Calculate the percentage nitrogen content in the dry specimen as follows:

$$A\,\% = \frac{28\,(V - b)\,N}{W}$$

where

A = percentage nitrogen in the clean dry specimen,

V = total volume in ml of standard sulphuric acid used in the determination,

b = total volume in ml of standard sulphuric acid used in the blank determination,

N = normality of standard sulphuric acid,

W = dry mass (g) of specimen.

6.2. Using the values of 0,22 % for the nitrogen content of jute and 16,2 % for the nitrogen content of animal fibre, both percentages being expressed on the dry mass of the fibre, calculate the composition of the mixture as follows:

$$PA\,\% = \frac{A - 0{,}22}{16{,}2 - 0{,}22} \times 100$$

where

PA % = percentage of animal fibre in the clean dry specimen.

7. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 13

POLYPROPYLENE FIBRES AND CERTAIN OTHER FIBRES

(Xylene method)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. polypropylene fibres (37)

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), acetate (19), cupro (21), modal (22), triacetate (24), viscose (25), acrylic (26), polyamide or nylon (30), polyester (35), glass fibre (44), elastomultiester (46) and melamine (48).

2. PRINCIPLE

The polypropylene fibre is dissolved out from a known dry mass of the mixture with boiling xylene. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of polypropylene is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Reflux condenser (suitable for liquids of high boiling point), fitting the conical flask (i).

3.2. Reagent

Xylene distilling between 137 and 142 ºC.

Note:

This reagent is highly flammable and has a toxic vapour. Suitable precautions must be taken in its use.

4. TEST PROCEDURE

Follow the procedure described in the general instructions then proceed as follows:

To the specimen contained in the conical flask (3.1 (i)), add 100 ml of xylene (3.2) per gram of specimen. Attach the condenser (3.1 (ii)), bring the contents to the boil and maintain at boiling point for three minutes.

Immediately decant the hot liquid through the weighed filter crucible (see Note 1). Repeat this treatment twice more, each time using a fresh 50 ml portion of solvent.

Wash the residue remaining in the flask successively with 30 ml of boiling xylene (twice), then with 75 ml of light petroleum (I.3.2.1 of general instructions) (twice). After the second wash with light petroleum, filter the contents of the flask through the crucible, transfer any residual fibres to the crucible with the aid of a small quantity of light petroleum and allow the solvent to evaporate. Dry the crucible and residue, cool and weigh them.

Notes:

1. The filter crucible through which the xylene is to be decanted must be pre-heated.

2. After the treatment with boiling xylene, ensure that the flask containing the residue is cooled sufficiently before the light petroleum is introduced.

3. In order to reduce the fire and toxicity hazards to the operator, a hot extraction apparatus using the appropriate procedures, giving identical results, may be used [24] (1).

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of 'd' is 1,00, except for melamine, for which 'd'=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

[24] See for example the apparatus described in Melliand Textilberichte 56 (1975), pp. 643-645.

METHOD No 14

CHLOROFIBRES (HOMOPOLYMERS OF VINYL CHLORIDE) AND CERTAIN OTHER FIBRES

(Concentrated sulphuric acid method)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. chlorofibres (27) based on homopolymers of vinyl chloride, whether after-chlorinated or not, elastolefin (47)

with

2. cotton (5), acetate (19), cupro (21), modal (22), triacetate (24), viscose (25), certain acrylics (26), certain modacrylics (29), polyamide or nylon (30), polyester (35), elastomultiester (46) and melamine (48).

The modacrylics concerned are those which give a limpid solution when immersed in concentrated sulphuric acid (relative density 1,84 at 20 ºC).

This method can be used in place of method Nos 8 and 9.

2. PRINCIPLE

The constituent other than the chlorofibre or the elastolefin (i.e. the fibres mentioned in paragraph 1.2) is dissolved out from a known dry mass of the mixture with concentrated sulphuric acid (relative density 1,84 at 20 °C).

The residue, consisting of the chlorofibre or the elastolefin, is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of the second constituents is obtained by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Glass rod with flattened end.

3.2. Reagents

(i) Sulphuric acid, concentrated (relative density 1,84 at 20 ºC).

(ii) Sulphuric acid, approximately 50 % (m/m) aqueous solution.

Prepare by adding carefully, while cooling, 400 ml of sulphuric acid (relative density 1,84 at 20 ºC) to 500 ml of distilled or deionized water. After cooling to room temperature, dilute the solution to one litre with water.

(iii) Ammonia, dilute solution.

Dilute 60 ml of concentrated ammonia solution (relative density 0,880 at 20 ºC) to one litre with distilled water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions, then proceed as follows:

To the specimen contained in the flask (3.1 (i)) add 100 ml of sulphuric acid (3.2 (i)) per gram of specimen.

Allow the contents of the flask to remain at room temperature for 10 minutes and during that time stir the test specimen occasionally by means of the glass rod. If a woven or knitted fabric is being treated, wedge it between the wall of the flask and the glass rod and exert a light pressure in order to separate the material dissolved by the sulphuric acid.

Decant the liquid through the weighed filter crucible. Add to the flask a fresh portion of 100 ml of sulphuric acid (3.2 (i)) and repeat the same operation.Transfer the contents of the flask to the filter crucible and transfer the fibrous residue there with the aid of the glass rod. If necessary, add a little concentrated sulphuric acid (3.2 (i)) to the flask in order to remove any fibres adhering to the wall. Drain the filter crucible with suction; remove the filtrate by emptying or changing the filter-flask, wash the residue in the crucible successively with 50 % sulphuric acid solution (3.2 (ii)), distilled or de-ionizedwater (I.3.2.3 of the general instructions, ammonia solution (3.2 (iii)) and finally wash thoroughly with distilled or de-ionized water, draining the crucible with suction after each addition. (Do not apply suction during the washing operation, but only after the liquid has drained off by gravity.) Dry the crucible and residue, cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00,except for melamine, for which ‘d’=1,01.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

METHOD No 15

CHLOROFIBRES, CERTAIN MODACRYLICS, CERTAIN ELASTANES,

ACETATES, TRIACETATES AND CERTAIN OTHER FIBRES

(Method using cyclohexanone)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. acetate (19), triacetate (24), chlorofibre (27), certain modacrylics (29), certain elastanes (43)

with

2. wool (1), animal hair (2 and 3), silk (4), cotton (5), cupro (21), modal (22), viscose (25), polyamide or nylon (30), acrylic (26), glass fibre (44) and melamine (48).

Where modacrylics or elastanes are present a preliminary test must first be carried out to determine whether the fibre is completely soluble in the reagent.

It is also possible to analyse mixtures containing chlorofibres by using method No 9 or 14.

2. PRINCIPLE

The acetate and triacetate fibres, chlorofibres, certain modacrylics, and certain elastanes are dissolved out from a known dry mass with Cyclohexanone at a temperature close to boiling point. The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of chlorofibre, modacrylic, elastane, acetate and triacetate is found by difference.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Hot extraction apparatus suitable for use in the test procedure in section 4. (See figure: this is a variant of the apparatus described in *Melliand Textilberichte* 56 (1975) 643 — 645).

(ii) Filter crucible to contain the specimen.

(iii) Porous baffle (porosity grade 1).

(iv) Reflux condenser that can be adapted to the distillation flask.

(v) Heating device.

3.2. Reagents

(i) Cyclohexanone, boiling point 156 ºC.

(ii) Ethyl alcohol, 50 % by volume.

NB:

Cyclohexanone is flammable and toxic. Suitable precautions must be taken in its use.

4. TEST PROCEDURE

Follow the procedure described in the general instructions and then proceed as follows:

Pour into the distillation flask 100 ml of cyclohexanone per gram of material, insert the extraction container in which the filter crucible, containing the specimen and the porous baffle, slightly inclined, have previously been placed. Insert the reflux condenser. Bring to the boil and continue extraction for 60 minutes at a minimum rate of 12 cycles per hour.

After extraction and cooling remove the extraction container, take out the filter crucible and remove the porous baffle. Wash the contents of the filter crucible three or four times with 50 % ethyl alcohol heated to about 60 ºC and subsequently with 1 litre of water at 60 ºC.

Do not apply suction during or between the washing operations. Allow the liquid to drain under gravity and then apply suction.

Finally, dry the crucible with the residue, cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ is 1,00 with the following exceptions:

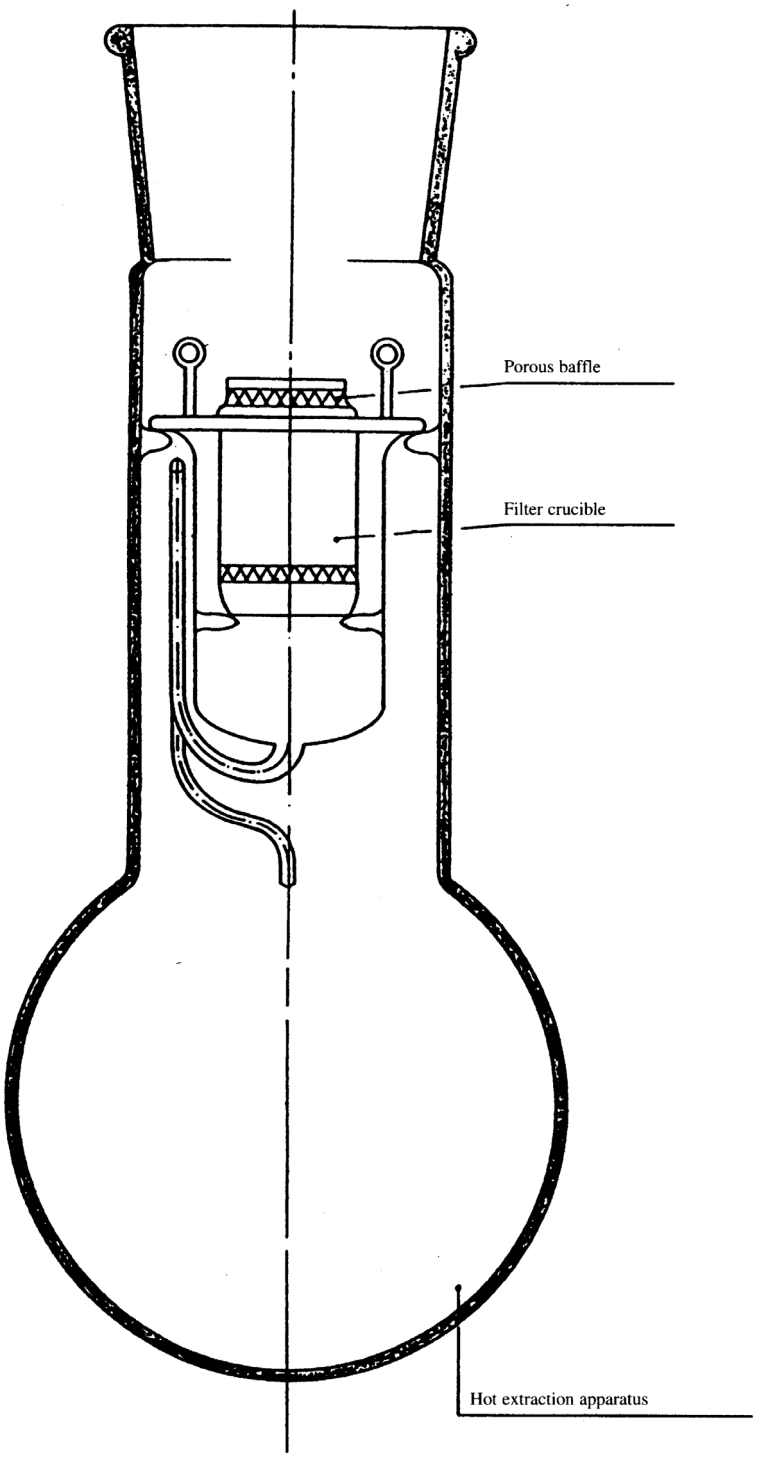
silk and melamine 1,01

acrylic 0,98.

6. PRECISION

On homogeneous mixtures of textile fibres, the confidence limits of results obtained by this method are not greater than ± 1 for a confidence level of 95 %.

Figure referred to in point 3.1 (i) of method No 15



METHOD 16

MELAMINE AND CERTAIN OTHER FIBRES

(Method using hot formic acid)

1. FIELD OF APPLICATION

This method is applicable, after removal of non-fibrous matter, to binary mixtures of:

1. melamine (47)

with

2. cotton (5) and aramid (31).

2. PRINCIPLE

The melamine is dissolved out from a known dry mass of the mixture with hot formic acid (90 % by mass).

The residue is collected, washed, dried and weighed; its mass, corrected if necessary, is expressed as a percentage of the dry mass of the mixture. The percentage of the second constituents is obtained by difference.

Note: Keep strictly the recommended temperature range because the solubility of melamine is very much dependent on temperature.

3. APPARATUS AND REAGENTS (other than those specified in the general instructions)

3.1. Apparatus

(i) Glass-stoppered conical flask of at least 200 ml capacity.

(ii) Shaking water bath or other apparatus to shake and maintain the flask at 90 ± 2 ºC.

3.2. Reagents

(i) Formic acid (90% m/m, relative density at 20 ºC: 1.204 g/ml). Dilute 890 ml of 98 to 100 % m/m formic acid (relative density at 20 ºC: 1.220 g/ml) to 1 liter with water.

Hot formic acid is very corrosive and must be handled with care.

(ii) Ammonia, dilute solution: dilute 80 ml of concentrated ammonia solution (relative density at 20 °C: 0.880) to 1 litre with water.

4. TEST PROCEDURE

Follow the procedure described in the general instructions, then proceed as follows:

To the specimen contained in the glass-stoppered conical flask of at least 200 ml capacity, add 100 ml of formic acid per gram of specimen. Insert the stopper and shake the flask to wet out the specimen. Maintain the flask in a shaking water bath at 90 ± 2 ºC for one hour, shaking it vigorously. Cool the flask to room temperature. Decant the liquid through the weighed filter crucible. Add 50 ml of formic acid to the flask containing the residue, shake manually and filter the contents of the flask through the filter crucible. Transfer any residual fibres to the crucible by washing out the flask with a little more formic acid reagent. Drain the crucible with suction and wash the residue with formic acid reagent, hot water, dilute ammonia solution, and finally cold water, draining the crucible with suction after each addition. Do not apply suction until each washing liquor has drained under gravity. Finally, drain the crucible with suction, dry the crucible and residue, and cool and weigh them.

5. CALCULATION AND EXPRESSION OF RESULTS

Calculate the results as described in the general instructions. The value of ‘d’ for cotton and aramid is 1,02.

6. PRECISION

On a homogeneous mixture of textile materials, the confidence limits of results obtained by this method are not greater than ± 2 for a confidence level of 95 %.

CHAPTER 3

Quantitative analysis of ternary fibre mixtures

INTRODUCTION

In general, the methods of quantitative chemical analysis are based on the selective solution of the individual components. There are four possible variants of this method:

1. Using two different test specimens, a component (a) is dissolved from the first test specimen, and another component (b) from the second test specimen. The insoluble residues of each specimen are weighed and the percentage of each of the two soluble components is calculated from the respective losses in mass. The percentage of the third component (c) is calculated by difference.

2. Using two different test specimens, a component (a) is dissolved from the first test specimen and two components (a and b) from the second test specimen. The insoluble residue of the first test specimen is weighed and the percentage of the component (a) is calculated from the loss in mass. The insoluble residue of the second test specimen is weighed; it corresponds to component (c). The percentage of the third component (b) is calculated by difference.

3. Using two different test specimens, two components (a and b) are dissolved from the first test specimen and two components (b and c) from the second test specimen. The insoluble residues correspond to the two components (c) and (a) respectively. The percentage of the third component (b) is calculated by difference.

4. Using only one test specimen, after removal of one of the components, the insoluble residue formed by the two other fibres is weighed and the percentage of the soluble component is calculated from the loss in mass. One of the two fibres of the residue is dissolved, the insoluble component is weighed and the percentage of the second soluble component is calculated from the loss in mass.

Where a choice is possible, it is advisable to use one of the first three variants.

Where chemical analysis is used, the expert responsible for the analysis must take care to select methods employing solvents which dissolve only the correct fibre(s), leaving the other fibre(s) intact.

By way of example, a table is given in Chapter 3.VI which contains a certain number of ternary mixtures, together with methods for analysing binary mixtures which can, in principle, be used for analysing these ternary mixtures.

In order to reduce the possibility of error to a minimum, it is recommended that, whenever possible, chemical analysis using at least two of the four abovementioned variants shall be made.

Before proceeding with any analysis, all the fibres present in the mixture must be identified. In some chemical methods, the insoluble component of a mixture may be partially dissolved in the reagent used to dissolve the soluble component(s). Wherever possible, reagents have been chosen that have little or no effect on the insoluble fibres. If a loss in mass is known to

occur during the analysis, the result shall be corrected; correction factors are given for this purpose. These factors have been determined in several laboratories by treating, with the appropriate reagent as specified in the method of analysis, fibres cleaned by the pre-treatment. These correction factors apply only to undergraded fibres and different correction factors may be necessary if the fibres have been degraded before or during processing. If the fourth variant, in which a textile fibre is subjected to the successive action of two different solvents, must be used, correction factors must be applied for possible losses in mass undergone by the fibre in the two treatments. At least two determinations shall be made, both in the case of manual separation and in the case of chemical separation.

I. General information on methods for the quantitative chemical analysis of ternary fibre mixtures

Information common to the methods given for the quantitative chemical analysis of ternary fibre mixtures.

I.1. Scope and field of application

The field of application of each method for analysing binary fibre mixtures specifies to which fibres the method is applicable. (See Chapter 2 relating to certain methods for the quantitative analysis of binary fibre mixtures).

I.2. Principle

After the identification of the components of a mixture, the non-fibrous material is removed by suitable pre-treatment and then one or more of the four variants of the process of selective solution described in the introduction is applied. Except where this presents technical difficulties, it is preferable to dissolve the major fibre component so as to obtain the minor fibre component as final residue.

I.3. Materials and equipment

I.3.1. Apparatus

I.3.1.1. Filter crucibles and weighing bottles large enough to contain such crucibles, or any other apparatus giving identical results.

I.3.1.2. Vacuum flask.

I.3.1.3. Desiccator containing self-indicating silica gel.

I.3.1.4. Ventilated oven for drying specimens at 105 ± 3 ºC.

I.3.1.5. Analytical balance, accurate to 0,0002 g.

I.3.1.6. Soxhlet extractor or other apparatus giving identical results.

I.3.2. Reagents

I.3.2.1. Light petroleum, redistilled, boiling range 40 to 60ºC.

I.3.2.2. Other reagents are specified in the appropriate sections of each method.

All reagents used shall be chemically pure.

I.3.2.3. Distilled or deionized water.

I.3.2.4. Acetone.

I.3.2.5. Orthophosphoric acid.

I.3.2.6. Urea.

I.3.2.7. Sodium bicarbonate.

I.4. Conditioning and testing atmosphere

Because dry masses are determined, it is unnecessary to condition the specimen or to conduct analyses in a conditioned atmosphere.

I.5. Laboratory test sample

Take a laboratory test sample that is representative of the laboratory bulk sample and sufficient to provide all the specimens, each of at least 1 g, that are required.

I.6. Pre-treatment of laboratory test sample [25]

Where a substance not to be taken into account in the percentage calculations (see Article 16) of this Regulation) is present, it shall first be removed by a suitable method that does not affect any of the fibre constituents.

For this purpose, non-fibrous matter which can be extracted with light petroleum and water is removed by treating the air-dry test sample in a Soxhlet extractor with light petroleum for one hour at a minimum rate of six cycles per hour. Allow the light petroleum to evaporate from the sample, which is then extracted by direct treatment consisting in soaking the specimen in water at room temperature for one hour and then soaking it in water at 65 ± 5 °C for a further hour, agitating the liquor from timeto time. Use a liquor:specimen ratio of 100:1. Remove the excess water from the sample by squeezing, suction or centrifuging and then allow the sample to become air-dry.

In the case of elastolefin or fibre mixtures containing elastolefin and other fibres (wool, animal hair, silk, cotton, flax, true hemp, jute, abaca, alfa, coir, broom, ramie, sisal, cupro, modal, protein, viscose, acrylic, polyamide or nylon, polyester, elastomultiester) the procedure just described shall be slightly modified, in fact light petroleum ether shall be replaced by acetone.

Where non-fibrous matter cannot be extracted with light petroleum and water, it shall be removed by substituting for the water method described above a suitable method that does not substantially alter any of the fibre constituents. However, for some unbleached, natural vegetable fibres (e.g. jute, coir) it is to be noted that normal pretreatment with light petroleum and water does not remove all the natural non-fibrous substances; nevertheless additional pre-

[25] See Chapter 1.1

treatment is not applied unless the sample does contain finishes insoluble in both light petroleum and water.

Analysis reports shall include full details of the methods of pre-treatment used.

I.7. Test procedure

I.7.1. General instructions

I.7.1.1. Drying

Conduct all drying operations for not less than 4 hours and not more than 16 hours at 105 ± 3 ºC in a ventilated oven with the oven door closed throughout. If the drying period is less than 14 hours, the specimen must be checkweighed to determine whether its mass is constant. The mass may be considered as constant if, after a further drying period of 60 minutes, its variation is less than 0,05 %.

Avoid handling crucibles and weighing bottles, specimens or residues with bare hands during the drying, cooling and weighing operations.

Dry specimens in a weighing bottle with its cover beside it. After drying, stopper the weighing bottle before removing it from the oven, and transfer it quickly to the desiccator.

Dry the filter crucible in a weighing bottle with its cover beside it in the oven. After drying, close the weighing bottle and transfer it quickly to the desiccator.

Where apparatus other than a filter crucible is used, drying operations shall be conducted in the oven so as to determine the dry mass of the fibres without loss.

I.7.1.2. Cooling

Conduct all cooling operations in the desiccator, placed beside the balance, until the cooling of the weighing bottles is complete, and in any case for not less than 2 hours.

I.7.1.3. Weighing

After cooling, complete the weighing of the weighing bottle within 2 minutes of its removal from the desiccator; weigh to an accuracy of 0,0002 g.

I.7.2. Procedure

Take from the pre-treated laboratory test sample a test specimen of at least 1 g (in mass). Cut yarn or cloth into lengths of about 10 mm, dissected as much as possible. Dry the specimen(s) in (a) weighing bottle(s) cool it (them) in the desiccator and weigh it (them). Transfer the specimen(s) to the glass vessel(s) specified in the appropriate section of the Community method, reweigh the weighing bottle(s) immediately and obtain the dry mass(es) of the specimen(s) by difference ; complete the test as specified in the appropriate section of the applicable method. Examine the residue(s) microscopically to check that the treatment has in fact completely removed the soluble fibre(s).

I.8. Calculation and expression of results

Express the mass of each component as a percentage of the total mass of fibre in the mixture. Calculate the results on the basis of dean dry mass, adjusted by (a) the conventional agreed allowances and (b) the correction factors necessary to take account of loss of non-fibrous matter during pre-treatment and analysis.

I.8.1. Calculation of percentages of mass of clean dry fibres disregarding loss of fibre mass during pre-treatment.

I.8.1.1. - VARIANT 1 -

Formulae to be applied where a component of the mixture is removed from one specimen and another component from a second specimen:

$$P_1\% = \left[\frac{d_2}{d_1} - d_2 \times \frac{r_1}{m_1} + \frac{r_2}{m_2} \times \left(1 - \frac{d_2}{d_1}\right)\right] \times 100$$

$$P_2\% = \left[\frac{d_4}{d_3} - d_4 \times \frac{r_2}{m_2} + \frac{r_1}{m_1} \times \left(1 - \frac{d_4}{d_3}\right)\right] \times 100$$

$$P_3\% = 100 - \left(P_1\% + P_2\%\right)$$

P_1% is the percentage of the first clean dry component (component in the first specimen dissolved in the first reagent);

P_2% is the percentage of the second clean dry component (component in the second specimen dissolved in the second reagent);

P_3% is the percentage of the third clean dry component (component undissolved in both specimens);

m_1 is the dry mass of the first specimen after pre-treatment;

m_2 is the dry mass of the second specimen after pre-treatment;

r_1 is the dry mass of the residue after removal of the first component from the first specimen in the first reagent;

r_2 is the dry mass of the residue after removal of the second component from the second specimen in the second reagent;

d_1 is the correction factor for loss in mass in the first reagent, of the second component undissolved in the first specimen [26],

d_2 is the correction factor for loss in mass in the first reagent, of the third component undissolved in the first specimen;

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[26] The values of d are indicated in Chapter 2 of this Annex relating to the various methods of analysing binary mixtures

d_3 is the correction factor for loss in mass in the second reagent, of the first component undissolved in the second specimen;

d_4 is the correction factor for loss in mass in the second reagent, of the third component undissolved in the second specimen.

I.8.1.2. - VARIANT 2 -

Formulae to be applied where a component (a) is removed from the first test specimen, leaving as residue the other two components (b + c), and two components (a + b) are removed from the second test specimen, leaving as residue the third component (c):

$$P_1\% = 100 - \left(P_2\% + P_3\%\right)$$

$$P_2\% = 100 \times \frac{d_1 r_1}{m_1} - \frac{d_1}{d_2} \times P_3\%$$

$$P_3\% = \frac{d_4 r_2}{m_2} \times 100$$

P_1% is the percentage of the first clean dry component (component in the first specimen dissolved in the first reagent);

P_2% is the percentage of the second clean dry component (component soluble, at the same time as the first component of the second specimen, in the second reagent);

P_3% is the percentage of the third clean dry component (component undissolved in both specimens);

m_1 is the dry mass of the first specimen after pre-treatment;

m_2 is the dry mass of the second specimen after pre-treatment;

r_1 is the dry mass of the residue after removal of the first component from the first specimen in the first reagent;

r_2 is the dry mass of the residue after removal of the first and second components from the second specimen in the second reagent;

d_1 is the correction factor for loss in mass in the first reagent, of the second component undissolved in the first specimen;

d_2 is the correction factor for loss in mass in the first reagent, of the third component undissolved in the first specimen;

d_4 is the correction factor for loss in mass in the second reagent, of the third component undissolved in the second specimen.

I.8.1.3. - VARIANT 3 -

Formulae to be applied where two components (a + b) are removed from a specimen, leaving as residue the third component (c), then two components (b + c) are removed from another specimen, leaving as residue the first component (a):

$$P_1\,\% = \frac{d_3\, r_2}{m_2} \times 100$$

$$P_2\,\% = 100 - \left(P_1\,\% + P_3\,\%\right)$$

$$P_3\,\% = \frac{d_2\, r_1}{m_1} \times 100$$

P_1% is the percentage of the first clean dry component (component dissolved by the reagent);

P_2% is the percentage of the second clean dry component (component dissolved by the reagent);

P_3% is the percentage of the third clean dry component (component dissolved in the second specimen by the reagent);

m_1 is the dry mass of the first specimen after pre-treatment;

m_2 is the dry mass of the second specimen after pre-treatment;

r_1 is the dry mass of the residue after the removal of the first and second components from the first specimen with the first reagent;

r_2 is the dry mass of the residue after the removal of the second and third components from the second specimen with the second reagent;

d_2 is the correction factor for loss in mass in the first reagent of the third component undissolved in the first specimen;

d_3 is the correction factor for loss in mass in the second reagent of the first component undissolved in the second specimen;

I.8.1.4. - VARIANT 4 -

Formulae to be applied where two components are successively removed from the mixture using the same specimen:

$$P_1\,\% = 100 - \left(P_2\,\% + P_3\,\%\right)$$

$$P_2\,\% = \frac{d_1\, r_1}{m} \times 100 - \frac{d_1}{d_2} \times P_3\,\%$$

$$P_3\,\% = \frac{d_3\, r_2}{m} \times 100$$

P_1% is the percentage of the first clean dry component (first soluble component);

P_2% is the percentage of the second clean dry component (second soluble component);

P_3% is the percentage of the third clean dry component (insoluble component);

m is the dry mass of the specimen after pre-treatment;

r_1 is the dry mass of the residue after elimination of the first component by the first reagent;

r_2 is the dry mass of the residue after elimination of the first and second component by the first and second reagent;

d_1 is the correction factor for loss in mass of the second component in the first reagent;

d_2 is the correction factor for loss in mass of the third component in the first reagent;

d_3 is the correction factor for loss in mass of the third component in the first and second reagents.

1.8.2. Calculation of the percentage of each component with adjustment by conventional agreed allowances and, where appropriate, correction factors for losses in mass during pre-treatment operations:

Given:

$$A = 1 + \frac{a_1 + b_1}{100} \quad B = 1 + \frac{a_2 + b_2}{100} \quad C = 1 + \frac{a_3 + b_3}{100}$$

then:

$$P_{1A}\% = \frac{P_1 A}{P_1 A + P_2 B + P_3 C} \times 100$$

$$P_{2A}\% = \frac{P_2 B}{P_1 A + P_2 B + P_3 C} \times 100$$

$$P_{3A}\% = \frac{P_3 C}{P_1 A + P_2 B + P_3 C} \times 100$$

P_1A% is the percentage of the first clean dry component, including moisture content and loss in mass during pre-treatment;

P_2A% is the percentage of the second clean dry component, including moisture content and loss in mass during pre-treatment;

P_3A% is the percentage of the third clean dry component, including moisture content and loss in mass during pre-treatment;

P_1 is the percentage of the first clean dry component obtained by one of the formula given in I.8.1.

P_2 is the percentage of the second clean dry component obtained by one of the formula given in I.8.1.

P_3 is the percentage of the third clean dry component obtained by one of the formula given in I.8.1.

a_1 is the conventional agreed allowance of the first component;

a_2 is the conventional agreed allowance of the second component;

a_3 is the conventional agreed allowance of the third component;

b_1 is the percentage of loss in mass of the first component during pre-treatment;

b_2 is the percentage of loss in mass of the second component during pre-treatment;

b_3 is the percentage of loss in mass of the third component during pre-treatment;

Where a special pre-treatment is used the values b_1, b_2 and b_3 shall be determined, if possible, by submitting each of the pure fibre constituents to the pre-treatment applied in the analysis. Pure fibres are those free from all non-fibrous material except those which they normally contain (either naturally or because of the manufacturing process), in the state (unbleached, bleached) in which they are found in the material to be analysed.

Where no clean separate constituent fibres used in the manufacture of the material to be analysed are available, average values of b_1, b_2 and b_3 as obtained from tests performed on clean fibres similar to those in the mixture under examination, must be used.

If normal pre-treatment by extraction with light petroleum and water is applied, correction factors b_1, b_2 and b_3 may generally be ignored, except in the case of unbleached cotton, unbleached flax and unbleached hemp where the loss due to pre-treatment is usually accepted as 4 % and in the case of polypropylene as 1 %.

In the case of other fibres, losses due to pre-treatment are usually disregarded in calculations.

I.8.3. Note

Calculation examples are given in Chapter 3.V.

II. Method of quantitative analysis by manual separation of ternary fibre mixtures

II.1. Scope

This method is applicable to textile fibres of all types provided they do not form an intimate mixture and that it is possible to separate them by hand.

II.2. Principle

After identification of the textile components, the non-fibrous matter is removed by a suitable pre-treatment and then the fibres are separated by hand, dried and weighed in order to calculate the proportion of each fibre in the mixture.

II.3. Apparatus

II.3.1. Weighing bottles or other apparatus giving identical results.

II.3.2. Desiccator containing self-indicating silica gel.

II.3.3. Ventilated oven for drying specimens at 105 ± 3 ºC.

II.3.4. Analytical balance accurate to 0,0002 g.

II.3.5. Soxhlet extractor, or other apparatus giving identical results.

II.3.6. Needle.

II.3.7. Twist tester or similar apparatus.

II.4. Reagents

II.4.1. Light petroleum, redistilled, boiling range 40 to 60 ºC.

II.4.2. Distilled or deionized water.

II.5. Conditioning and testing atmosphere

See I.4.

II.6. Laboratory test sample

See I.5.

II.7. Pre-treatment of laboratory test samples

See I.6.

II.8. Procedure

II.8.1. Analysis of yarn

Take from the pre-treated laboratory test sample a specimen of mass not less than 1 g. For a very fine yarn, the analysis may be made on a minimum length of 30 m, whatever its mass.

Cut the yarn into pieces of a suitable length and separate the fibre types by means of a needle and, if necessary, a twist tester. The fibre types so obtained are placed in pre-weighed weighing bottles and dried at 105 ± 3 ºC to constant mass, as described in I.7.1 and I.7.2.

II.8.2. Analysis of cloth

Take from the pre-treated laboratory test sample a specimen of mass not less than 1 g, not including a selvedge with edges carefully trimmed to avoid fraying and running parallel with weft or warp yarns, or in the case of knitted fabrics in the line of the wales and courses. Separate the different types of fibres and collect them in pre-weighed weighing bottles and proceed as described in II.8.1.

II.9. Calculation and expression of results

Express the mass of each component fibre as a percentage of the total mass of the fibres in the mixture. Calculate the results on the basis of clean dry mass, adjusted by (a) the conventional agreed allowances and (b) the correction factors necessary to take account of losses in mass during pre-treatment operations.

II.9.1. Calculation of percentage masses of clean dry fibre, disregarding loss in fibre mass during pre-treatment:

$$P_1\,\% = \frac{100\,m_1}{m_1 + m_2 + m_3} = \frac{100}{1 + \dfrac{m_2 + m_3}{m_1}}$$

$$P_2\,\% = \frac{100\,m_2}{m_1 + m_2 + m_3} = \frac{100}{1 + \dfrac{m_1 + m_3}{m_2}}$$

$$P_3\,\% = 100 - \left(P_1\,\% + P_2\,\%\right)$$

P_1% is the percentage of the first clean dry component;

P_2% is the percentage of the second clean dry component;

P_3% is the percentage of the third clean dry component;

m_1 is the clean dry mass of the first component;

m_2 is the clean dry mass of the second component;

m_3 is the clean dry mass of the third component;

II.9.2. For calculation of the percentage of each component with adjustment by conventional agreed allowances and, where appropriate, by correction factors for losses in mass during pre-treatment : see I.8.2.

III. Method of quantitative analysis of ternary fibre mixtures by a combination of manual separation and chemical separation

Wherever possible, manual separation shall be used, taking account of the proportions of components separated before proceeding to any chemical treatment of each of the separate components.

IV.1. Precision of the methods

The precision indicated in each method of analysis of binary mixtures relates to the reproducibility (see Chapter 2 relating to certain methods for the quantitative analysis of binary textile fibre mixtures).

Reproducibility refers to the reliability, ie the closeness of agreement between experimental values obtained by operators in different laboratories or at different times using the same method and obtaining individual results on specimens of an identical homogeneous mixture.

Reproducibility is expressed by confidence limits of the results for a confidence level of 95 %.

By this is meant that the difference between two results in a series of analyses made in different laboratories would, given a normal and correct application of the method to an identical and homogeneous mixture, be exceeded only in 5 cases out of 100.

To determine the precision of the analysis of a ternary mixture the values indicated in the methods for the analysis of binary mixtures which have been used to analyse the ternary mixture are applied in the usual way.

Given that in the four variants of the quantitative chemical analysis of ternary mixtures, provision is made for two dissolutions (using two separate specimens for the first three variants and a single specimen for the fourth variant) and, assuming that E_1 and E_2 denote the precision of the two methods for analysing binary mixtures, the precision of the results for each component is shown in the following table:

Component fibre	Variants		
	1	2 and 3	4.
a	E_1	E_1	E_1
b	E_2	E_1+E_2	E_1+E_2
c	E_1+E_2	E_2	E_1+E_2

If the fourth variant is used, the degree of precision may be found to be lower than that calculated by the method indicated above, owing to possible action of the first reagent on the residue consisting of components b and c, which would be difficult to evaluate.

IV.2. Test report

IV.1. Indicate the variant(s) used to carry out the analysis, the methods, reagents and correction factors.

IV.2. Give details of any special pre-treatments (See I.6).

IV.3. Give the individual results and the arithmetic mean, each to the 1st decimal place.

IV.4. Wherever possible, state the precision of the method for each component, calculated according to the table in section IV.1.

V. Examples of the calculation of percentages of the components of certain ternary mixtures using some of the variants described in point I.8.1.

Consider the case of a fibre mixture which gave the following components when qualitatively analysed for raw material composition: 1. carded wool; 2.nylon (polyamide); 3.unbleached cotton.

VARIANT No. 1

Using this variant, that is using two different specimens and removing one component (a = wool) by dissolution from the first specimen and a second component (b = polyamide) from the second specimen, the following results can be obtained:

1. Dry mass of the first specimen after pre-treatment is(m_1) = 1,6000g

2. Dry mass of the residue after treatment with alkaline sodium hypochlorite (polyamide+cotton) (r_1) = 1,4166 g

3. Dry mass of the second specimen after pre-treatment (m_2) = 1,8000 g

4. Dry mass of the residue after treatment with formic acid (wool+cotton) (r_2) = 0,9000 g

Treatment with alkaline sodium hypochlorite does not entail any loss in mass of polyamide, while unbleached cotton losses 3%, therefore d_1 = 1,0 and d_2 = 1,03.

Treatment with formic acid does not entail any loss in mass for wool or unbleached cotton, therefore d_3 and d_4 = 1,0.

If the values obtained by chemical analysis and the correction factors are substituted in the formula under I.8.1.1., the following result is obtained:

P_1% (wool) = [1,03/1,0 – 1,03×1,4166/1,6000 + 0,9000/1,8000 × (1 – 1,03 / 1,0)] ×100 = 10,30

P_2% (polyamide) = [1,0 / 1,0 – 1,0×0,9000 / 1,8000 + 1,4166 / 1,6000 × (1– 1,0 /1,0)] ×100 = 50,00

P_3% (cotton) = 100–(10,30 + 50,00) = 39,70

The percentages of the various clean dry fibres in the mixture are as follows:

wool	10,30%
polyamide	50,00%
cotton	39,70%

These percentages must be corrected according to the formulae under I.8.2., in order to take account of the conventional agreed allowances and the correction factors for any losses in mass after pre-treatment.

As indicated in Annex IX, the conventional agreed allowances are as follows: carded wool 17,0%, polyamide 6,25%, cotton 8,5%, also unbleached cotton shows a loss in mass of 4%, after pre-treatment with light petroleum and water.

Therefore:

P_1A% (wool) = 10,30×[1+(17,0+0,0)/100] / [10,30×(1+ (17,0+0,0)/100) + 50,00× (1+ (6,25+0,0)/100) + 39,70×(1+(8,5+4,0 /100)] × 100 = 10,97

P_2A% (polyamide) = 50,0 × (1+ (6,25+0,0)/100) /109,8385 ×100 = 48,37

$P_3A\%$ (cotton) = 100 - (10,97 + 48,37) = 40,66

The raw material composition of the yarn is therefore as follows:

polyamide	48,4%
cotton	40,6%
wool	11,0%
	100,0%

VARIANT No. 4:

Consider the case of a fibre mixture which when qualitatively analysed gave the following components: carded wool, viscose, unbleached cotton.

Suppose that using variant 4, that is successively removing two components from the mixture of one single specimen, the following results are obtained:

1. Dry mass of the specimen after pre-treatment (m_1) = 1,6000 g

2. Dry mass of the residue after treatment with alkaline sodium hypochlorite (viscose+cotton) (r_1) = 1,4166 g

3. Dry mass of the residue after the second treatment of the residue r_1 with zinc chloride/formic acid (cotton)

(r_2) = 0,6630 g

Treatment with alkaline sodium hypochlorite does not entail any loss in mass of viscose, while unbleached cotton losses 3%, therefore d_1 =1,0 and d_2 = 1,03.

As a result of treatment with formic acid-zinc chloride, the mass of cotton increases by 4%, so that d_3 = 1,03×0,96 = 0,9888, rounded to 0,99, (d_3 being the correction factor for the respective loss or increase in mass of the third component in the first and second reagents).

If the values obtained by chemical analysis and the correction factors are substituted in the formulae given in I.8.1.4., the following result is obtained:

$P_2\%$ (viscose) = 1,0×1,4166 / 1,6000 ×100 – 1,0 / 1,03 ×40,98=48,75 %

$P_3\%$ (cotton) = 0,99×0,6630 / 1,6000 × 100= 41,02 %

$P_1\%$ (wool) = 100 - (48,75 + 41,02) = 10,23 %

As has already been indicated for Variant 1, these percentages must be corrected by the formulae indicated in point I.8.2.

$P_1A\%$ (wool) = 10,23 × [1 + (17,0+0,0 / 100)]/[10,23×(1+ (17,00+0,0)/100) +48,75×(1+(13+0,0 / 100) + 41,02×(1+(8,5+4,0)/ 100)] × 100 = 10,57%

$P_2A\%$(viscose) = 48,75× [1+(13+0,0) / 100] / 113,2041 ×100 = 48,65%

$P_3A\%$ (cotton) = 100 - (10,57 + 48,65) = 40,78%

The raw material composition of the mixture is therefore as follows:

viscose	48,6%
cotton	40,8%
wool	10,6%
	100,0%

VI. Table of typical ternary mixtures which may be analysed using community methods of analysis of binary mixtures (for illustration purposes)

Mixture No.	Component fibres			Variant	Number of method used and reagent for binary mixtures
	Component 1	Component 2	Component 3		
1.	wool or hair	Viscose, cupro or certain types of modal	cotton	1 and/or 4	2. (alkaline sodium hypochlorite) and 3 (zinc chloride/formic acid)
2.	wool or hair	polyamide 6 or 6-6	cotton, viscose, cupro or modal	1 and/or 4	2. (alkaline sodium hypochlorite) and 4. (formic acid, 80% w/w)
3.	wool, hair or silk	certain chlorofibres	viscose, cupro modal or cotton	1 and/or 4	2. (alkaline sodium hypochlorite) and 9 (carbon disulphide/acetone 55,5/44,5 w/w)
4.	wool or hair	polyamide 6 or 6-6	polyester, polypropylene, acrylic or glass fibre	1 and/or 4	2. (alkaline sodium hypochlorite) and 4. (formic acid, 80% w/w)
5.	wool, hair or silk	certain chlorofibres	polyester, acrylic, polyamide or glass fibre	1 and/or 4	2. (alkaline sodium hypochlorite) and 9 (carbon disulphide/acetone 55,5/44,5 w/w)
6.	silk	wool or hair	polyester	2	11. (sulphuric acid 75% w/w) and 2. (alkaline sodium hypochlorite)
7.	polyamide 6 or 6-6	acrylic	cotton, viscose, cupro or modal	1 and/or 4	4. (formic acid 80% w/w) and 8. (dymethylformamide)
8.	certain chlorofibres	polyamide 6 or 6-6	cotton, viscose, cupro or modal	1 and/or 4	8. (dymethylformamide) and 4. (formic acid, 80% w/w)

Mixture No.	Component fibres			Variant	Number of method used and reagent for binary mixtures
	Component 1	Component 2	Component 3		
					or 9. (carbon disulphide/acetone, 55,5/44,5% w/w) and 4. (formic acid, 80% w/w)
9.	acrylic	polyamide 6 or 6-6	polyester	1 and/or 4	8. (dymethylformamide) and 4. (formic acid, 80% w/w)
10.	acetate	polyamide 6 or 6-6	viscose, cotton, cupro or modal	4	1. (acetone) and 4. (formic acid, 80% w/w)
11.	certain chlorofibres	acrylic	polyamide	2 and/or 4	9. (carbon disulphide/acetone 55,5/44,5% w/w) and 8. (dymethylformamide)
12.	certain chlorofibres	polyamide 6 or 6-6	acrylic	1 and/or 4	9. (carbon disulphide/acetone 55,5/44,5.% w/w) and 4. (formic acid, 80% w/w)
13.	polyamide 6 or 6-6	viscose, cupro, modal or cotton	polyester	4	4. (formic acid, 80% w/w) and 7. (sulphuric acid, 75% w/w)
14.	acetate	viscose, cupro, modal or cotton	polyester	4	1. (acetone) and 7 (sulphuric acid, 75% w/w)
15.	acrylic	viscose, cupro, modal or cotton	polyester	4	8. (dymethylformamide) and 7 (sulphuric acid, 75%w/w)
16.	acetate	wool, hair or silk	cotton, viscose, cupro, modal, polyamide,	4	1. (acetone) and 2. (alkaline sodium hypochlorite)

Mixture No.	Component fibres			Variant	Number of method used and reagent for binary mixtures
	Component 1	Component 2	Component 3		
			polyester, acrylic		
17.	triacetate	wool, hair or silk	cotton, viscose, cupro, modal, polyamide, polyester, acrylic	4	6. (dichloromethane) and 2. (alkaline sodium hypochlorite)
18.	acrylic	wool, hair or silk	polyester	1 and/or 4	8. (dymethylformamide) and 2. (alkaline sodium hypochlorite)
19.	acrylic	silk	wool or hair	4	8. (dymethylformamide) and 11. (sulphuric acid 75% w/w)
20.	acrylic	wool or hair silk	cotton, viscose, cupro or modal	1 and/or 4	8. (dymethylformamide) and 2 (alkaline sodium hypochlorite)
21.	wool, hair or silk	cotton, viscose, modal, cupro	polyester	4	2. (alkaline sodium hypochlorite) and 7. (sulphuric acid 75%)
22.	viscose, cupro or certain types of modal	cotton	polyester	2 and/or 4	3. (zinc chloride/formic acid) and 7 (sulphuric acid 75% w/w)
23.	acrylic	viscose, cupro or certain types of modal	cotton	4	8. (dymethylformamide) and 3 (zinc chloride/formic acid)
24.	Certain	viscose, cupro or certain types of	cotton	1 and/or	9. (carbon disulphide/acetone, 55,5/44,5% w/w) and 3. (zinc chloride/formic acid) or 8 (dymethylformamide) and 3. (zinc

Mixture No.	Component fibres			Variant	Number of method used and reagent for binary mixtures
	Component 1	Component 2	Component 3		
	chlorofibres	modal		4	chloride/formic acid)
25.	acetate	viscose, cupro or certain types of modal	cotton	4	1. (acetone) and 3 (zinc chloride/formic acid)
26.	triacetate	viscose, cupro or certain types of modal	cotton	4	6. (dichloromethane) and 3 (zinc chloride/formic acid)
27.	acetate	silk	wool or hair	4	1. (acetone) and 11. (sulphuric acid 75% w/w)
28.	triacetate	silk	wool or hair	4	6. (dichloromethane) and 11. (sulphuric acid 75% w/w)
29.	acetate	acrylic	cotton, viscose, cupro or modal	4	1. (acetone) and 8. (dymethylformamide)
30.	triacetate	acrylic	cotton, viscose, cupro or modal	4	6. (dichloromethane) and 8. (dymethylformamide)
31.	triacetate	polyamide 6 or 6-6	cotton, viscose, cupro or modal	4	6. (dichloromethane) and 4. (formic acid 80% w/w)
32.	triacetate	cotton, viscose, cupro or modal	polyester	4	6. (dichloromethane) and 7 (sulphuric acid 75% w/w)

Mixture No.	Component fibres			Variant	Number of method used and reagent for binary mixtures
	Component 1	Component 2	Component 3		
33.	acetate	polyamide 6 or 6-6	polyester or acrylic	4	1. (acetone) and 4. (formic acid 80% w/w)
34.	acetate	acrylic	polyester	4	1. (acetone) and 8. (dymethylformamide)
35.	certain chlorofibres	cotton, viscose, cupro or modal	polyester	4	8. (dymethylformamide) and 7. (sulphuric acid 75% w/w) or 9 (carbon disulphide/acetone, 55,5/44,5% w/w) and 7. (sulphuric acid 75% w/w)
36	cotton	polyester	elastolefin	2 and/or 4	7 (sulphuric acid 75 % w/w) and 14 (concentrated sulphuric acid)
[37	Certain modacrylics	polyester	melamine	2 and/or 4	8 (dimethylformamide) and 14 (concentrated sulphuric acid)]

ANNEX IX

AGREED ALLOWANCES USED TO CALCULATE THE MASS OF FIBRES CONTAINED IN A TEXTILE PRODUCT

(Article 17(2))

Fibre No	Fibres	Percentages
1—2	Wool and animal hair:	
	combed fibres	18,25
	carded fibres	17,00([1])
3	Animal hair:	
	combed fibres	18,25
	carded fibres	17,00([1])
	Horsehair:	
	combed fibres	16,00
	carded fibres	15,00
4	Silk	11,00
5	Cotton:	
	normal fibres	8,50
	mercerized fibres	10,50
6	Kapok	10,90
7	Flax	12,00
8	True hemp	12,00
9	Jute	17,00
10	Abaca	14,00
11	Alfa	14,00
12	Coir	13,00
13	Broom	14,00
14	Ramie (bleached fibre)	8,50

15	Sisal	14,00
16	Sunn	12,00
17	Henequen	14,00
18	Maguey	14,00
19	Acetate	9,00
20	Alginate	20,00
21	Cupro	13,00
22	Modal	13,00
23	Protein	17,00
24	Triacetate	7,00
25	Viscose	13,00
26	Acrylic	2,00
27	Chlorofibre	2,00
28	Fluorofibre	0,00
29	Modacrylic	2,00
30	Polyamide or nylon:	
	discontinuous fibre	6,25
	filament	5,75
31	Aramid	8,00
32	Polyimide	3,50
33	Lyocell	13,00
34	Polylactide	1,50
35	Polyester:	
	discontinuous fibre	1,50
	filament	1,50
36	Polyethylene	1,50
37	Polypropylene	2,00

38	Polycarbamide	2,00
39	Polyurethane	
	discontinuous fibre	3,50
	filament	3,00
40	Vinylal	5,00
41	Trivinyl	3,00
42	Elastodiene	1,00
43	Elastane	1,50
44	Glass fibre:	
	with an average diameter of over 5 μm	2,00
	with an average diameter of 5 μm or less	3,00
45	Metal fibre	2,00
	Metallized fibre	2,00
	Asbestos	2,00
	Paper yarn	13,75
46	Elastomultiester	1,50
47	Elastolefin	1,50
48	Melamine	7,00

([1]) The agreed allowances of 17,00 % shall also be applied where it is impossible to ascertain whether the textile product containing wool and/or animal hair is combed or carded.

([1])

ANNEX X

CORRELATION TABLES

Directive 96/74/EC	This Regulation
Article 1	Article 4(1)
Article 2(1)	Article 3(1)(a)
Article 2(2) introductory wording	Article 3(1) introductory wording
Article 2(2) first indent	Article 3(1)(b)(i)
Article 2(2) second indent	Article 3(1)(b)(ii)
Article 2(3) introductory wording	Article 2(1) introductory wording
Article 2(3) first indent	Article 2(1)(a)
Article 2(3) second indent	Article 2(1)(b) and (c)
Article 2(3) third indent	Article 2(1)(d)
Article 3	Article 5
Article 4	Article 7
Article 5(1)	Article 8(1) and Annex III
Article 5(2)	Article 8(2)
Article 5(3)	Article 8(3)
Article 6(1)	Article 9(1)
Article 6(2)	Article 9(2)
Article 6(3)	Article 9(3)
Article 6(4)	Article 18
Article 6(5)	Article 9(4)
Article 7	Article 10
Article 8(1)	Article 11(1)
Article 8(2)(a)	Article 12(1)
Article 8(2)(b)	Article 12(2) and (3)
Article 8(2)(c)	Article 12(4)

Article 8(2)(d)	-
Article 9(1)	Article 13(1)
Article 9(2)	Article 13(2)
Article 9(3)	Article 14 and Annex IV
Article 10(1)(a)	Article 15(2)
Article 10(1)(b)	Article 15(3)
Article 10(1)(c)	Article 15(4)
Article 10(2)	Article 15(1)second subparagraph
Article 11	Article 11(2) third subparagraph
Article 12	Article 16 and Annex VII
Article 13	Article 17(2)
Article 14(1)	-
Article 14(2)	Article 4(2)
Article 15	Article 2(2)
Article 16	Articles 19 and 20
Article 17	-
Article 18	-
Article 19	-
Annex I No 1 to 46	Annex I No 1 to 47
Annex II No 1 to 46	Annex IX No 1 to 47
Annex III	Annex V
Annex III point 36	Article 3(1)(h)
Annex IV	Annex VI
Annex V	-
Annex VI	-

Directive 96/73/EC	This Regulation

Article 1	Article 1
Article 2	Annex VIII chapter 1 section I (2)
Article 3	Article 17 (2) first subparagraph
Article 4	Article 17 (3)
Article 5 (1)	Article 20 (1)
Article 5 (2)	Article 19
Article 6	Article 20 (2)
Article 7	-
Article 8	-
Article 9	-
Annex I	Annex VIII chapter 1 section I
Annex II (1) introduction	Annex VIII chapter 1 section II
Annex II (1) sections I, II and III	Annex VIII chapter 2 sections I, II and III
Annex II (2)	Annex VIII chapter 2 section IV

Directive 73/44/EEC	This Regulation
Article 1	Article 1
Article 2	Annex VIII chapter 1 section I
Article 3	Article 17 (2) first subparagraph
Article 4	Article 17 (3)
Article 5	Articles 19 and 20
Article 6	-
Article 7	-
Annex I	Annex VIII chapter 3 introduction and sections I to IV
Annex II	Annex VIII chapter 3 section V
Annex III	Annex VIII chapter 3 section VI