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**Textiles — Tests for colour fastness —
Part C : Colour fastness to washing and laundering**

Textiles — Essais de solidité des teintures — Partie C : Solidité des teintures au lavage

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Foreword

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

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

International Standard ISO 105/C was developed by Technical Committee ISO/TC 38, *Textiles*.

NOTE — International Standard ISO 105 is presented in the form of parts. Each of these parts corresponds to a group and is split up into its different component sections. This form facilitates the replacement of existing sections by successive editions as necessary.

Section C06, contained in this second edition of part C of ISO 105, was circulated to the member bodies in December 1979 and completes sections C01-1978, C02-1978, C03-1978, C04-1978 and C05-1978.

This part of ISO 105 cancels and replaces group C of ISO 105-1978.

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Textiles — Tests for colour fastness —

C01 Colour fastness to washing : Test 1¹⁾

1 Scope and field of application

This is Test No. 1 of a series of five washing tests that have been established to investigate the fastness to washing of coloured textiles and which between them cover the range of washing procedures from mild to severe.

NOTE — This method is designed to determine the effect of washing only on the colour fastness of the textile. It is not intended to reflect the result of the comprehensive laundering procedure.

2 Principle

A specimen of the textile in contact with specified adjacent fabrics is mechanically agitated under specified conditions of time and temperature in a soap solution, then rinsed and dried. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with the grey scales.

radially, glass or stainless steel containers (75 ± 5 mm diameter \times 125 ± 10 mm high) of 550 ± 50 ml capacity, the bottom of the containers being 45 ± 10 mm from the centre of the shaft. The shaft/container assembly is rotated at a frequency of 40 ± 2 min⁻¹. The temperature of the water bath is thermostatically controlled to maintain the test solution at the prescribed temperature ± 2 °C.

4.2 Soap, containing not more than 5 % moisture and complying with the following requirements based upon dry mass :

— free alkali, calculated as Na₂CO₃ : 3 g/kg maximum

— free alkali, calculated as NaOH : 1 g/kg maximum

total fatty matter : 850 g/kg minimum

titre of mixed fatty acids, prepared from soap : 30 °C maximum

— iodine value : 50 maximum

3 References

ISO 105 :

Section A01, *General principles of testing*.

Section A02, *Grey scale for assessing change in colour*.

Section A03, *Grey scale for assessing staining*.

The soap shall be entirely free from fluorescent brightening agents.

4.3 Soap solution, containing 5 g of soap (4.2) per litre of distilled water.

4 Apparatus and reagents

4.1 Suitable mechanical device (see clause 8) consisting of a water bath containing a rotatable shaft which supports,

4.4 Two adjacent fabrics, each measuring 10 cm \times 4 cm, one piece made of the same kind of fibre as that of the textile to be tested, or that predominating in the case of blends, the second piece made of the fibre as indicated in the following table or, in the case of blends, of the kind of fibre second in order of predominance, or as otherwise specified.

1) This test superseded ISO Recommendation R 105/1, *Tests for colour fastness of textiles (First series) — Part 21 : "Colour fastness to washing — Hand washing"*.

If first piece is :	Second piece to be :
cotton	wool
wool	cotton
silk	cotton
linen	cotton
viscose	wool
acetate	viscose
polyamide	wool or viscose
polyester	wool or cotton
acrylic	wool or cotton

4.5 Grey scales for assessing change in colour and staining (see clause 3).

5 Test specimen

5.1 If the textile to be tested is fabric, place a specimen 10 cm × 4 cm between the two adjacent fabrics (4.4) and sew along all four sides to form a composite specimen.

5.2 If the textile to be tested is yarn, knit it into fabric and treat it as in 5.1, or form a layer of parallel lengths of it between the two adjacent fabrics (4.4), the amount of yarn taken being approximately equal to half the combined mass of the adjacent fabrics. Sew along all four sides to hold the yarn in place and to form a composite specimen.

5.3 If the textile to be tested is loose fibre, comb and compress an amount approximately equal to half the combined mass of the adjacent fabrics (4.4) into a sheet 10 cm × 4 cm. Place the sheet between the two adjacent fabrics and sew along all four sides to hold the fibre in place and to form a composite specimen.

6 Procedure

6.1 Place the composite specimen in the container and add the necessary amount of soap solution (4.3), previously heated to 40 ± 2 °C, to give a liquor ratio of 50 : 1.

6.2 Treat the composite specimen at 40 ± 2 °C for 30 min.

6.3 Remove the composite specimen, rinse it twice in cold distilled water and then in cold running tap water for 10 min and squeeze it. Open out the composite specimen by breaking the stitching on all sides except one of the shorter sides and dry it by hanging it in air at a temperature not exceeding 60 °C, with the three parts in contact only at the remaining line of stitching.

6.4 Assess the change in colour of the specimen and the staining of the adjacent fabrics with the grey scales.

7 Test report

Report the numerical ratings for the change in colour of the test specimen and for the staining of each kind of adjacent fabric used.

8 Notes

8.1 Suitable testing devices are :

— Launderometer as described in the *Technical Manual of the American Association of Textile Chemists and Colorists* (AATCC), Test Method 61;

— Linitest, as described in *Melliands Textilberichte* 49 (1968), 6, pp. 709-711;

— Wash Wheel sponsored by the Society of Dyers and Colourists.

8.2 Other mechanical devices may be used for this test, provided that the results are identical with those obtained by the apparatus described in 4.1.

Textiles — Tests for colour fastness —

C02 Colour fastness to washing : Test 2

1 Scope and field of application

This is Test No. 2 of a series of five washing tests that have been established to investigate the fastness to washing of coloured textiles and which between them cover the range of washing procedures from mild to severe.

NOTE — This method is designed to determine the effect of washing only on the colour fastness of the textile. It is not intended to reflect the result of the comprehensive laundering procedure.

2 Principle

A specimen of the textile in contact with specified adjacent fabrics is mechanically agitated under specified conditions of time and temperature in a soap solution, then rinsed and dried. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with the grey scales.

3 References

ISO 105 :

- Section A01, *General principles of testing.*
- Section A02, *Grey scale for assessing change in colour.*
- Section A03, *Grey scale for assessing staining.*

4 Apparatus and reagents

4.1 Suitable mechanical device (see clause 8) consisting of a water bath containing a rotatable shaft which supports, radially, glass or stainless steel containers (75 ± 5 mm diameter \times 125 ± 10 mm high) of 550 ± 50 ml capacity, the bottom of the containers being 45 ± 10 mm from the centre of the shaft. The shaft/container assembly is rotated at a frequency of 40 ± 2 min⁻¹. The temperature of the water bath is thermostatically controlled to maintain the test solution at the prescribed temperature ± 2 °C.

4.2 Soap, containing not more than 5 % moisture and complying with the following requirements based upon dry mass.

- free alkali, calculated as Na₂CO₃ : 3 g/kg maximum
- free alkali, calculated as NaOH : 1 g/kg maximum
- total fatty matter : 850 g/kg minimum
- titre of mixed fatty acids, prepared from soap : 30 °C maximum
- iodine value : 50 maximum

The soap shall be entirely free from fluorescent brightening agents.

4.3 Soap solution, containing 5 g of soap (4.2) per litre of distilled water

4.4 Two adjacent fabrics each measuring 10 cm \times 4 cm, one piece made of the same kind of fibre as that of the textile to be tested, or that predominating in the case of blends, the second piece made of the fibre as indicated in the following table or, in the case of blends, of the kind of fibre second in order of predominance, or as otherwise specified.

If first piece is :	Second piece to be :
cotton	wool
wool	cotton
silk	cotton
linen	cotton
viscose	wool
acetate	viscose
polyamide	wool or viscose
polyester	wool or cotton
acrylic	wool or cotton

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4.5 Grey scales for assessing change in colour and staining (see clause 3).

5 Test specimen

5.1 If the textile to be tested is fabric, place a specimen 10 cm × 4 cm between the two adjacent fabrics (4.4) and sew along all four sides to form a composite specimen.

5.2 If the textile to be tested is yarn, knit it into fabric and treat it as in 5.1, or form a layer of parallel lengths of it between the two adjacent fabrics (4.4), the amount of yarn taken being approximately equal to half the combined mass of the adjacent fabrics. Sew along all four sides to hold the yarn in place and to form a composite specimen.

5.3 If the textile to be tested is loose fibre, comb and compress an amount approximately equal to half the combined mass of the adjacent fabrics (4.4) into a sheet 10 cm × 4 cm. Place the sheet between the two adjacent fabrics and sew along all four sides to hold the fibre in place and to form a composite specimen.

6 Procedure

6.1 Place the composite specimen in the container and add the necessary amount of soap solution (4.3), previously heated to 50 ± 2 °C, to give a liquor ratio of 50:1.

6.2 Treat the composite specimen at 50 ± 2 °C for 45 min.

6.3 Remove the composite specimen, rinse it twice in cold distilled water and then in cold running tap water for 10 min and squeeze it. Open out the composite specimen by breaking the stitching on all sides except one of the shorter sides and dry it by hanging it in air at a temperature not exceeding 60 °C, with the three parts in contact only at the remaining line of stitching.

6.4 Assess the change in colour of the specimen and the staining of the adjacent fabrics with the grey scales.

7 Test report

Report the numerical ratings for the change in colour of the test specimen and for the staining of each kind of adjacent fabric used.

8 Notes

8.1 Suitable testing devices are :

— Launderometer as described in the *Technical Manual of the American Association of Textile Chemists and Colorists* (AATCC), Test Method 61;

— Linitest, as described in *Melliands Textilberichte* 49 (1968), 6, pp. 709-711;

— Wash Wheel sponsored by the Society of Dyers and Colourists.

8.2 Other mechanical devices may be used for this test, provided that the results are identical with those obtained by the apparatus described in 4.1.

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Textiles — Tests for colour fastness —

C03 Colour fastness to washing : Test 3

1 Scope and field of application

This is Test No. 3 of a series of five washing tests that have been established to investigate the fastness to washing of coloured textiles and which between them cover the range of washing procedures from mild to severe.

NOTE — This method is designed to determine the effect of washing only on the colour fastness of the textile. It is not intended to reflect the result of the comprehensive laundering procedure.

2 Principle

A specimen of the textile in contact with specified adjacent fabrics is mechanically agitated under specified conditions of time and temperature in a solution of soap and sodium carbonate, then rinsed and dried. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with the grey scales.

3 References

ISO 105 :

- Section A01, *General principles of testing.*
- Section A02, *Grey scale for assessing change in colour.*
- Section A03, *Grey scale for assessing staining.*

4 Apparatus and reagents

4.1 Suitable mechanical device (see clause 8) consisting of a water bath containing a rotatable shaft which supports, radially, glass or stainless steel containers (75 ± 5 mm diameter \times 125 ± 10 mm high) of 550 ± 50 ml capacity, the bottom of the containers being 45 ± 10 mm from the centre of the shaft. The shaft/container assembly is rotated at a frequency of 40 ± 2 min⁻¹. The temperature of the water bath is thermostatically controlled to maintain the test solution at the prescribed temperature ± 2 °C.

4.2 Soap, containing not more than 5 % moisture and complying with the following requirements based upon dry mass.

- free alkali, calculated as Na₂CO₃ : 3 g/kg maximum
- free alkali, calculated as NaOH : 1 g/kg maximum
- total fatty matter : 850 g/kg minimum
- titre of mixed fatty acids, prepared from soap : 30 °C maximum
- iodine value : 50 maximum

The soap shall be entirely free from fluorescent brightening agents.

4.3 Soap solution, containing 5 g of soap (4.2) and 2 g of anhydrous sodium carbonate per litre of distilled water.

4.4 Two adjacent fabrics each measuring 10 cm \times 4 cm, one piece made of the same kind of fibre as that of the textile to be tested, or that predominating in the case of blends, the second piece made of the fibre as indicated in the following table or, in the case of blends, of the kind of fibre second in order of predominance, or as otherwise specified.

If first piece is :	Second piece to be :
cotton	wool
wool	cotton
silk	cotton
linen	cotton
viscose	wool
acetate	viscose
polyamide	wool or viscose
polyester	wool or cotton
acrylic	wool or cotton

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4.5 Grey scales for assessing change in colour and staining (see clause 3).

5 Test specimen

5.1 If the textile to be tested is fabric, place a specimen 10 cm × 4 cm between the two adjacent fabrics (4.4) and sew along all four sides to form a composite specimen.

5.2 If the textile to be tested is yarn, knit it into fabric and treat it as in 5.1, or form a layer of parallel lengths of it between the two adjacent fabrics (4.4), the amount of yarn taken being approximately equal to half the combined mass of the adjacent fabrics. Sew along all four sides to hold the yarn in place and to form a composite specimen.

5.3 If the textile to be tested is loose fibre, comb and compress an amount approximately equal to half the combined mass of the adjacent fabrics (4.4) into a sheet 10 cm × 4 cm. Place the sheet between the two adjacent fabrics and sew along all four sides to hold the fibre in place and to form a composite specimen.

6 Procedure

6.1 Place the composite specimen in the container and add the necessary amount of soap solution (4.3), previously heated to 60 ± 2 °C, to give a liquor ratio of 50 : 1.

6.2 Treat the composite specimen at 60 ± 2 °C for 30 min.

6.3 Remove the composite specimen, rinse it twice in cold distilled water and then in cold running tap water for 10 min and squeeze it. Open out the composite specimen by breaking the stitching on all sides except one of the shorter sides and dry it by hanging it in air at a temperature not exceeding 60 °C, with the three parts in contact only at the remaining line of stitching.

6.4 Assess the change in colour of the specimen and the staining of the adjacent fabrics with the grey scales.

7 Test report

Report the numerical ratings for the change in colour of the test specimen and for the staining of each kind of adjacent fabric used.

8 Notes

8.1 Suitable testing devices are :

— Launderometer as described in the *Technical Manual of the American Association of Textile Chemists and Colorists* (AATCC), Test Method 61;

— Linitest, as described in *Melliands Textilberichte* 49 (1968), 6, pp. 709-711;

— Wash Wheel sponsored by the Society of Dyers and Colourists.

8.2 Other mechanical devices may be used for this test, provided that the results are identical with those obtained by the apparatus described in 4.1.

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Textiles — Tests for colour fastness —

C04 Colour fastness to washing : Test 4

1 Scope and field of application

This is Test No. 4 of a series of five washing tests that have been established to investigate the fastness to washing of coloured textiles and which between them cover the range of washing procedures from mild to severe.

NOTE — This method is designed to determine the effect of washing only on the colour fastness of the textile. It is not intended to reflect the result of the comprehensive laundering procedure.

2 Principle

A specimen of the textile in contact with specified adjacent fabrics is mechanically agitated under specified conditions of time and temperature in a solution of soap and sodium carbonate, then rinsed and dried. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with the grey scales.

3 References

ISO 105 :

Section A01, *General principles of testing.*

Section A02, *Grey scale for assessing change in colour.*

Section A03, *Grey scale for assessing staining.*

4 Apparatus and reagents

4.1 Suitable mechanical device (see clause 8) consisting of a water bath containing a rotatable shaft which supports, radially, glass or stainless steel containers (75 ± 5 mm diameter \times 125 ± 10 mm high) of 550 ± 50 ml capacity, the bottom of the containers being 45 ± 10 mm from the centre of the shaft. The shaft/container assembly is rotated at a frequency of 40 ± 2 min⁻¹. The temperature of the water bath is thermostatically controlled to maintain the test solution at the prescribed temperature ± 2 °C.

4.2 Non-corrodible (stainless) steel balls, approximately 0,6 cm in diameter.

4.3 Soap, containing not more than 5 % moisture and complying with the following requirements based upon dry mass.

- free alkali, calculated as Na₂CO₃ : 3 g/kg maximum
- free alkali, calculated as NaOH : 1 g/kg maximum
- total fatty matter : 850 g/kg minimum
- titre of mixed fatty acids, prepared from soap : 30 °C maximum
- iodine value : 50 maximum

The soap shall be entirely free from fluorescent brightening agents.

4.4 Soap solution, containing 5 g of soap (4.3) and 2 g of anhydrous sodium carbonate per litre of distilled water.

4.5 Two adjacent fabrics each measuring 10 cm \times 4 cm, one piece made of the same kind of fibre as that of the textile to be tested, or that predominating in the case of blends, the second piece made of the fibre as indicated in the following table or, in the case of blends, of the kind of fibre second in order of predominance, or as otherwise specified.

If first piece is :	Second piece to be :
cotton	viscose
silk	cotton
linen	cotton or viscose
viscose	cotton
triacetate	viscose
polyamide	cotton or viscose
polyester	cotton or viscose
acrylic	cotton or viscose

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