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Dyed cotton

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3 Terms and definitions

3 The following terms and definitions apply to this document.

3.1 dyed cotton: A cotton product made from cotton, including raw cotton, carded cotton web and combed cotton web, that has been through a dyeing and finishing process.

3.2 partial uneven color: A colour difference that appears over a small area or in scattered spots inside a cotton bale, including local colour flecks, colour stains, colour spots, colour specks and colour patches.

3.3 diffusive uneven color: A colour difference spread evenly over a wide area within a whole lot of product.

3.4 white powder: The white dust deposited on the fibre surface by the insoluble calcium carbonate precipitate formed when the calcium and magnesium ions of hard water meet soap liquor or soda ash.

4 Technical requirements

4.1 Appearance quality indexes. The appearance quality requirements are given in Table 1, which states the requirement for two grades, superior grade and first grade. For colour

difference, expressed in grades and read as not less than the stated value, the colour difference against the reference sample is 4-5 for superior grade and 4 for first grade, the colour difference between bales of the same lot is 4-5 for superior grade and 4 for first grade, and the colour difference inside one bale is 4-5 for both grades. Partial uneven colour is to be not noticeable for superior grade and not to affect the appearance for first grade. For diffusive uneven colour the colour difference is to be not less than grade 4 for superior grade and not less than grade 3-4 for first grade. White powder, oil stain, rust spot and mould spot are to be absent for superior grade and not noticeable for first grade.

4.2 Intrinsic quality indexes. The intrinsic quality requirements are given in Table 2, which again states the requirement for superior grade and for first grade. Length, in millimetres, is to be not less than 27 for both grades. Breaking tenacity, in cN/tex, is to be not less than 25 for superior grade, or 23 for a deep shade, and not less than 23 for first grade, or 21 for a deep shade. Short fibre content, in per cent, is to be not more than 15 for superior grade and 18 for first grade when the product is raw cotton; when the product is a cotton web it is not more than 15 carded and 10 combed for superior grade, and not more than 18 carded and 12 combed for first grade. Trash content, in per cent, is to be not more than 2.5 for superior grade and 3.0 for first grade when the product is raw cotton, and for a cotton web not more than 0.5 carded and 0.2 combed for both grades. Neps, in grains per gram, are to be not more than 30 for superior grade and 40 for first grade when the product is raw cotton; for a cotton web not more than 25 carded and 15 combed for superior grade, and not more than 35 carded and 25 combed for first grade.

4.2 Table 2 continues with the following requirements. Micronaire is 4.2 to 4.8 for superior grade and 3.8 to 5.0 for first grade. Moisture regain, in per cent, is 6.5 to 8.5 for superior grade and 5.5 to 9.5 for first grade. Formaldehyde content, in mg/kg, is to be not more than 20 for both grades. The pH value is 4.0 to 7.5 for superior grade and 4.0 to 8.5 for first grade. Decomposable aromatic amine dyes, in mg/kg, are prohibited for both grades. Odour is to be absent for both grades. Colour fastness, expressed in grades and read as not less than the stated value, is as follows: light fastness, change in colour, 4 for superior grade or 3-4 for a light shade, and 3-4 for first grade or 3 for a light shade; saliva fastness, change in colour 4 and staining 4 for superior grade, not assessed for first grade; water fastness, change in colour 3-4 and staining 3-4 for superior grade, 3 and 3 for first grade; soaping fastness, change in colour 3-4 and staining 3-4 for superior grade, 3 and 3 for first grade; perspiration fastness, acid and alkaline, change in colour 3-4 and staining 3-4 for superior grade, 3 and 3 for first grade; rubbing fastness, dry rubbing 4-5 for superior grade and 4 for first grade, wet rubbing 3 for superior grade or 2-3 for a deep shade and 2-3 for first grade or 2 for a deep shade.

4.2 Two footnotes are attached to Table 2. The first states that, as specified in GB/T 4841.3, a colour deeper than the 1/12 standard depth of dye shade is a deep shade and a colour equal to or lighter than the 1/12 standard depth of dye shade is a light shade. The second states that, when rubbing fastness is assessed, a product processed with sulphur dyes is

allowed a half-grade reduction; that when light fastness is assessed, a whitened product is allowed a half-grade reduction; and that saliva fastness is assessed only for superior grade.

4.3 Grading rules. 4.3.1 The product grades are superior grade and first grade, and anything below first grade is off-grade. 4.3.2 The grade of the product is assessed jointly from the intrinsic quality and the appearance quality, the lower of the two grades being taken. Intrinsic quality is graded by lot, the lowest single item being the basis for grading the lot. Appearance quality is graded by bale, the lowest single bale being the basis for grading the lot.

5 Test methods

5.1 Sampling. 5.1.1 The sampling is to be representative. 5.1.2 Baled dyed cotton is sampled for inspection lot by lot. 5.1.3 Sampling quantity: with up to 3 bales every bale is inspected; from 4 to 10 bales not fewer than 3 bales are sampled; from 11 to 20 bales not fewer than 4 bales; from 21 to 30 bales not fewer than 5 bales; from 31 to 60 bales not fewer than 6 bales; above 60 bales, 1 bale is sampled for every 10 bales. 5.1.4 Sampling method: each bale to be sampled is opened at the middle of the front face, the surface cotton is removed, and a sample of not less than 50 g is taken to form the appearance inspection lot sample, the total sample mass being not less than 300 g; after the lot sample has been taken, a moisture regain sample of about 100 g is taken from the inner layer of the bale, 10 cm to 15 cm from the outer layer, and sealed in a sampling can to form the moisture regain inspection lot sample. The lot sample has to carry the colour number, the lot number and the shift. 5.1.5 The specimens for testing the intrinsic quality indexes are drawn at random from the appearance inspection lot sample.

5.2.1 Appearance quality. 5.2.1.1 Appearance quality is inspected by visual examination, and a standard light source cabinet is to be used when colour is examined visually. 5.2.1.2 The dyed cotton to be tested is kept under standard temperature and humidity, that is a temperature of 20 degrees Celsius plus or minus 2 and a relative humidity of 65 % plus or minus 3, for not less than 4 h, so that the cotton reaches equilibrium with the temperature and humidity of the surroundings, before inspection. 5.2.1.3 During inspection the specimen and the reference sample are held and gripped in the hand so that their densities are close, laid side by side and their positions exchanged from time to time, the direction of observation being roughly perpendicular to the surface of the cotton sample. The grey scale for assessing change in colour is used as the standard, and the grade whose perceived colour difference is closest to that between the specimen and the reference sample is taken as the colour difference grade of the specimen.

5.2.2 Intrinsic quality. Length is determined according to GB/T 6098.1 or GB/T 20392. Short fibre content is determined according to GB/T 6098.1. Breaking tenacity is determined according to GB/T 13783. Trash content is determined according to GB/T 6499. Neps are determined according to GB/T 6103. Micronaire is determined according to GB/T 6498 or

GB/T 20392. Moisture regain is determined by the electrical meter method or the oven method, the oven method being the reference, according to GB/T 6102.1 or GB/T 6102.2. Formaldehyde content is determined according to GB/T 2912.1. The pH value is determined according to GB/T 7573. Decomposable aromatic amine dyes are determined according to GB/T 17592 and GB/T 23344. Odour is determined according to GB 18401. Light fastness is determined according to method 3 of GB/T 8427. Saliva fastness is determined according to GB/T 18886. Water fastness is determined according to GB/T 5713. Soaping fastness is determined according to method B2 of GB/T 3921. Perspiration fastness is determined according to GB/T 3922. Rubbing fastness is determined according to GB/T 3920, the coloured fibre being first spun into 20S single yarn and then tested.

5.2.3 Weight inspection. 5.2.3.1 A finished bale of dyed cotton that has been oven dried is to be left standing for not less than 24 h before weight inspection. 5.2.3.2 Weight inspection is carried out lot by lot, the lot being the unit, and the gross weight is recorded. The accuracy of the weighing instrument is not lower than one part per thousand and, when weighing, the load should be as close as possible to the maximum capacity of the instrument. 5.2.3.3 The net weight and the conditioned weight of each lot are determined and calculated according to GB 1103.

6 Packaging and marking, transport and storage

6.1 The packaging is to be complete when the product is baled. The bale type is the same throughout one lot, and the difference in weight between bales is to be not more than 10 % of the average bale weight.

6.2 The packaging material is to be grey cotton cloth, plastic or another material that does not contaminate the cotton and does not generate foreign fibres. The strapping material may be galvanized steel wire, carbon steel strip, high-strength steel strip or plastic strapping.

6.3 On a bale packed in cotton cloth the marking is brushed in black at the two ends of the bale and includes the grade, the processing unit, the colour, the lot number, the bale number, the weight, the production date and the shift. On a bale packed in plastic a label is fixed at the two ends by adhesive sticking or by another means, and the content of the label is the same as for cotton cloth packaging.

6.4 Each lot of product is to be accompanied by a quality inspection sheet which, besides the marking content of 6.3, also includes all the technical index items, the test results and the items that caused a downgrading; the packing list is to state the total net weight and the conditioned weight of the lot.

6.5 During storage the dyed cotton is to be stored sorted by lot, with attention to ventilation and protection against damp, so as to prevent mould and fire, and exposure to sunlight is to be avoided.