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JJG

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Fiber Tapes and Measuring Ropes

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Verification Regulation of Fiber Tapes and Measuring Ropes

1 Scope

This Regulation is applicable to the finalization identification, prototype test, initial verification, subsequent verification, and in-use inspection of fiber tapes (including plastic tapes and cloth tapes, hereinafter referred to as tapes) and measuring ropes.

2 Normative References

QB 1519-1992, Fibre band tape

OIML International Recommendation R35, Material measures of length for general use

JJF 1001-1998, General Terms in Metrology and Their Definitions

JJF 1059-1999, Evaluation and Expression of Uncertainty in Measurement

JJG 1015-1990, General Norm for Pattern Evaluation and Pattern Approval of Measuring Instruments

When using this Regulation, care shall be taken to use the currently valid versions of the above cited documents.

3 Summary

Tapes and measuring ropes are a measuring tool for measuring length. It is generally used for length and dimension measurement in civil engineering, municipal transportation, civil and other aspects.

The main structures of tape and measuring rope are composed of pull ring or head, fiber measuring tape, rocking handle, box or metal (plastic) frame, etc. Measuring ropes and tapes without boxes can be folded into a ring shape.

The nominal range of the tape is generally within (0~50) m. Special specifications include 100 m, 150 m, and 200 m. The nominal range of the measuring rope is generally within (0~200) m.

head, or it can be at least 100 mm away from the pull ring of the tape head. The distance between the finish line and the box mouth shall be at least 150 mm. The distance between the zero-point line of the measuring rope and the pull ring of the ruler head shall not be less than 200 mm. The end line pattern shall not be less than 250 mm from the end.

5.8 The full length, manufacturer's name (or trademark),  (measuring instrument manufacturing license) logo and exit-factory number shall be marked on the measuring tape or tape box. Numbers and text must be clear and neat.

The tape for the first verification shall meet the above requirements. The tape for subsequent verification and in-use inspection is allowed to have appearance defects that do not affect its performance.

6 Measuring instrument control

6.1 Type identification or prototype test

6.1.1 General

6.1.1.1 The manufacturer shall apply for new measuring instrument stereotype appraisal or prototype testing for newly developed tapes and measuring ropes in accordance with the relevant provisions of the "Administrative Measures for New Measuring Instruments Products".

6.1.1.2 No modification or addition to the approved model is allowed without permission.

6.1.2 Technical basis

It is carried out in accordance with the relevant requirements of JJF 1015-1990 "General Norm for Pattern Evaluation and Pattern Approval of Measuring Instruments".

6.1.3 Stereotype appraisal items, requirements and methods

6.1.3.1 Stereotype appraisal items

During the stereotype appraisal, in addition to all the verification items in this Regulation (see Table 3), the tape's measuring tape shall also be subjected to a tensile test and a water immersion shrinkage test (plastic tapes are not subject to a water immersion shrinkage test). Conduct a water immersion shrinkage test on the measuring rope. If necessary, the printing fastness, breakage resistance and breaking strength of the tape's measuring tape can also be tested.

6.1.3.2 Stereotype appraisal test requirements and methods

The test requirements, test methods and procedures for the tape's measuring tape tensile test, water immersion shrinkage test and measuring rope water immersion shrinkage test shall be conducted in accordance with Appendix A and Appendix B.

The test requirements, methods and procedures for the printing fastness, breakage resistance and breaking strength test of the tape's measuring tape shall be carried out in accordance with the relevant provisions of QB 1519-1992 "Fibre band tape".

6.1.4 Sampling method and result judgment of samples for stereotype appraisal

6.1.4.1 The samples for the stereotype appraisal test shall be randomly selected from the products that have passed the exit-factory inspection. Sampling adopts one-time sampling inspection in GB 2828.

6.1.4.2 To apply for the stereotype appraisal of a series of new products, select one-third of the representative specifications from each series of products for testing. The selection of specifications for a new series of products shall be determined by the technical agency conducting the stereotype appraisal based on the technical documents provided by the applicant.

6.1.4.3 The determination of the stereotype appraisal test results shall be carried out in accordance with the relevant provisions of GB 2828 and GB 2829.

6.1.5 The application for prototype test is the same as the application for new product stereotype appraisal. The test items and test methods of the prototype test shall be consistent with the stereotyped test items and test methods. Its technical indicators shall not be lower than the stereotyped form.

6.2 Initial verification, subsequent verification and in-use verification

6.2.1 Verification conditions

6.2.1.1 Environmental conditions

Verification temperature:

Grade 1 tape: $(20 \pm 5)^{\circ}\text{C}$

Grade 2 tape and measuring rope: $(20 \pm 10)^{\circ}\text{C}$

Humidity: $\leq 75\% \text{RH}$

6.2.1.2 Verification of pulling force

The pulling force for tape verification is 10 N. The tensile force when testing the rope

Appendix B

Test method for measuring tape shrinkage when immersed in water

B.1 Water immersion shrinkage test

B.1.1 Test requirements

B.1.1.1 Immerse the cloth tape in $(20\pm 5)^{\circ}\text{C}$ water for 30 min. After being taken out to dry, the shrinkage rate of the cloth tape when immersed in water shall not exceed 0.1%, that is, the shrinkage per meter shall not exceed 1 mm.

B.1.1.2 The water immersion shrinkage of the measuring rope shall not exceed 0.2%.

B.1.2 Test equipment

B.1.2.1 Grade 1 steel tape.

B.1.2.2 Tape verification bench and pool.

B.1.2.3 50 N, 10 N weights.

B.1.3 Test conditions

Ambient temperature: $(20\pm 5)^{\circ}\text{C}$. Humidity: $\leq 75\%\text{RH}$.

B.1.4 Test method

B.1.4.1 According to the verification method in 6.2.3.4 of this Regulation, lay the tape to be tested and the grade 1 steel tape as a sample flat on the tape verification bench. Select a test length L_0 (L_0 is generally not less than 5 m) for verification. Read the deviation value b_1 of the measuring point.

B.1.4.2 Immerse the testing tape in $(20\pm 5)^{\circ}\text{C}$ water for 30 min. Remove the tape and wait until it is dry, then repeat the above test. Read the deviation value b_2 of the measuring point again.

B.1.5 Processing of test result

Substitute the deviation values b_1 and b_2 read at the measuring point L_0 into formula B.1. Calculate the shrinkage δ of the measuring tape after being immersed in water. δ shall not exceed the requirements of B.1.1.

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