

TERMS OF REFERENCE FOR THE R&D PROJECTS

Technical Committee: Wool, Wool Products and Textile Floor Coverings Sectional Committee- TXD 04 under Textile Division Council;

1. Title of the Project:

Study of constructional and performance requirements for handmade wool blended carpet used in floor covering applications and packaging practices of carpets.

2. Background

2.1 Handmade wool carpet is textile floor covering that is manufactured using traditional hand knotting methods, with wool as the primary material. It finds its application mainly in living rooms, halls, offices or stair runners. BIS has published IS 5641:1993 for Handmade Carpet manufactured from 100 % wool for its use in floor covering applications. Nowadays manufacturers are using synthetic yarn blends in handmade wool carpets to improve fiber resiliency, stain resistance and durability and facilitate dyeing and printing. Accordingly, the constructional and performance requirements for wool blended carpets have to be included in the subsequent revision of IS 5641:1993. The outcome of the R&D project will serve as the basis for revision of IS 5641:1993 to include the construction and performance requirements for wool blended carpet and align the standard as per the latest industry practices.

2.2 Carpets are transported in suitable packaging to ensure that product is protected during transportation, storage, and handling. The important aspects of packaging of carpet include material selection, packaging methods, handling instructions, labelling and protection from moisture and damage. BIS has published IS 5756:1970 'Code for packaging of carpets' which specifies the procedure of packaging of hand tufted or handmade carpet using polyethylene, hessian and jute twine. Nowadays industries are using innovative packaging materials like synthetic cushioning materials, paperboard, synthetic wrappings, labels, tags, recyclable or ecofriendly materials etc. The outcome of the R&D project will serve as the basis for revision of IS 5756:1970 'Code for packaging of carpets' to incorporate the newer packaging methods used in carpet industries and align the standard as per the latest packaging practices followed by industries for internal and export trades.

3. Objective

To collect the technical data and scientific evidence for constructional and performance requirement of handmade wool blended carpet and current packaging practices of carpets for internal and export trades from primary and secondary sources.

4. Scope

- a) Undertake study and analyse the existing literature which include but not restricted to the following: -

- i) International standard and regulation,
 - ii) Journals and research papers,
 - iii) Standard operating procedures (SOPs)/guidelines of Ministry/regulator/users,
 - iv) Studies/research conducted by any organization,
 - v) Any other relevant published information.
- b) Collection of the database for manufacturers (small, medium and large-scale), testing infrastructure and users in the country.
- c) Collection of import and export data, type of standards and regulation being followed by domestic/foreign manufacturers, comparative analysis of these standards and regulation.
- d) Undertake 2 visits to each of small, medium and large-scale manufacturer and collect the information on the following aspects: -
- i) Types of raw material being used
 - ii) Manufacturing process
 - iii) In-process controls being exercised during manufacturing
 - iv) Varieties being manufactured
 - v) Standards being followed
 - vi) Testing method being used
 - vii) Testing infrastructure available
 - viii) Post manufacturing quality/in-house data for safety, performance and constructional parameter for all the varieties being manufactured
 - ix) Details of finishing given to carpet (e.g. Moth proofing, anti-static, anti bacterial, anti-stain, fire-retardant or any other specific finishing treatment)
 - x) Newer/innovative materials used in packaging of carpets
 - xi) Details of pre-packaging practices/cleaning/brooming
 - xii) Maximum weight
 - xiii) Sampling plan being followed
 - xiv) Marking and labelling of the product
 - xv) Packaging practices for internal trade and exports
 - xvi) Sustainability practices [sustainable raw material, energy efficient processes and methodologies, renewable energy sources, 3Rs (Reduce, Reuse and Recycle), waste management and disposal mechanisms]
 - xvii) Focused group discussions with teams involved in production, testing, and R&D to address quality issues, discuss challenges faced, and gather suggestions for improvement

The feedback from other manufacturers (where visit is not carried out) shall be collected by circulating suitable questionnaire covering above information through email or any other digital means.

- e) Undertake 2 visits to users and 2 visits to testing labs (one govt and one private NABL accredited lab) to collect information including but not restricted to the following: -

User

- i) Standards and regulations being followed
- ii) Compliance mechanism being followed (test certificate from supplier, third party testing)
- iii) Focused group discussion on quality issues, challenges being faced and suggestions if any.

Lab

- i) Standards and regulation being followed
- ii) Testing methods being followed
- iii) Testing infrastructure
- iv) Focused group discussion on testing related issues, challenges being faced and suggestion

The feedback from users and labs (govt and private NABL accredited) where visit is not carried out shall be obtained through suitable questionnaire covering above information.

- f) Purchase/collect samples and testing of samples for parameters including but not restricted to warp and weft yarn count, pile yarn count, method of knotting, selvedge, dimension, pile content, pile density, number of knots, pile height and colourfastness to light, water, organic solvent, rubbing (dry), staining, as per following sampling plan:

Sl. No.	Number of samples	Type of Industry
1	02	Large scale
2	02	Medium scale
3	02	Small scale
Total	06 (03 samples to be tested in Govt Lab, 03 samples to be tested in Pvt. Lab)	

- g) Preparation of a comprehensive project report covering all the above information.

4. Expected Deliverables

- a) Final Analytical report, in hard copy format, covering all aspects mentioned in scope
- b) Questionnaires, discussion and visit reports, test reports, to be appended with the final analytical report

5. Research Methodology: -

- a) Collect and analyze the data/information as specified in the scope [4 (a), (b) and (c)].
- b) Visit manufacturers, users and labs and collect data/information as specified in the scope [4 (d) and (e)].
- c) Collect and test the samples as specified in the scope 4 (f).

d) Analysis the data/information and prepare a comprehensive project report.

6. Expected Deliverables: -

- a) Comprehensive report in soft/hard form of study covering all the aspects detailed in the scope of the R & D project.
- b) Questionnaire feedback, testing report, focussed group discussion report, other relevant documents and information shall be appended to the project report.

7. Requirement for the CVs: -

Graduate in textile technology or textile engineering or textiles chemistry or fibre science and technology or manmade fibre technology or carpet and textile technology.

8. Timeline and Method of progress Review: -

The duration of the project is 120 days from the date of the award of the project. The stagewise indicative timelines are as follows:

Indicative Time line	Method of progress
0 to 20 days	Literature review, desktop study, collection of data and information Note — The sampling plan for visit and collection of samples shall be discussed and finalized with nodal officer after literature survey and desktop research.
21 to 60 days	Visit to manufacturer, user, testing lab and collection of samples
60 to 100 days	Testing of samples (except long duration test with testing time more than 30 days) Preparation and submission of first draft report
100 to 120 days	Submission of the final project report

9. Support BIS will provide: -

- a) All the relevant Indian Standards/ISO Standards or any other standards required during the project will be provided by BIS.
- b) Facilitate/introduction of the project leader/organization to relevant Industry and industry association, testing lab, institute, academia, user, regulator/ministries.
- c) Facilitate testing of samples in BIS Lab/BIS Recognized Lab.

10. Nodal Point

In case any queries/clarification, Shri Himanshu Shukla, Sc-B & Member Secretary, TXD 04 may be contacted on txd@bis.gov.in.