TERMS OF REFERENCE FOR THE R&D PROJECT

[Industrial Fabrics Sectional Committee TXD 33 under Textiles Department of BIS]

1) **Title of the project: -** Study of constructional and performance requirement of synthetic tarpaulins (heavy duty protective covers) made from nylon or polyester coated fabrics

2) **Background: -**

2.1 Synthetic tarpaulins are used for covering goods transported by truck and open wagons, heavy plants and machinery, equipments, and a variety of critical and high value, items which are stored in open and are sensitive to moisture, rain and sunlight. The main characteristics of these covers are very high degree of water proofness, excellent mechanical strength, ease in handling and long useful service life. These synthetic tarpaulins (heavy duty protective covers) provide very good protection against sun and rain.

2.2 BIS published IS 14597:1998, Synthetic tarpaulins (heavy duty protective covers) made from coated nylon or polyester fabrics which covers requirements, methods of sampling and test for heavy duty protective cover (HDPC) made from PVC coated synthetic fabrics. This standard can be accessed from https://standardsbis.bsbedge.com/.

2.3 IS 14597 only covers the heavy-duty tarpaulin made from PVC coated fabric with only 600 GSM. As per information available, there are different varieties of synthetic tarpaulin based on coating process, GSM range and thickness which are being used but not covered in the existing standard.

2.4 This R & D project will serve as basis for revision of the standard and aligning the requirements given in this standard with the present scenario of industry and trade.

3) **Objective**

To collect the technical data and scientific evidence for constructional and performance requirement of synthetic tarpaulins (heavy duty protective covers) used in industrial and commercial application from primary and secondary sources.

4) **Scope: -**

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

- Indian Standard, International standard and regulation,
- Journals and research papers,
- Standard operating procedures (SOPs)/guidelines of Ministry/regulator/users,

- Studies/research conducted by any organization
- 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 which include but not restricted to the following :-

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) In house data for constructional, general and performance parameter for all the varieties being manufactured
ix) Sampling plan being followed, criteria of conformity
x) Marking and labelling of the product
xi) Packaging and storage conditions
xii) Sustainability practices [sustainable raw material, energy efficient processes and methodologies, renewable energy sources, 3Rs (Reduce, Reuse and Recycle), waste management and disposal mechanisms]
xiii) 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 (one Govt and one private) and 2 visits to NABL accredited testing labs (one Govt/ and one private) 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, testing charges, testing time
iv) Focused group discussion on testing related issues, challenges being faced and suggestion

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

f) Collection/purchase of 2 samples from each from large, medium and small-scale industries for each variety of synthetic tarpaulins and carry out testing from 2 NABL accredited lab (1 Govt Lab and 1 Pvt. Lab) for parameters which include but not restricted to the following:

i) GSM
ii) Breaking strength (before and after ageing test)
iii) Tear strength (before and after ageing test)
iv) Coating adhesion test
v) Heat ageing test
vi) Blocking
vii) Dimensional change due to shrinkage
viii) Colorfastness test (rubbing, washing, light)
ix) Accelerated ageing test
x) Water proofness test
xi) Resistance to damage by flexing
xii) Resistance to cold test
xiii) Shear strength of joints/seam
xiv) Flame resistance test
xv) Fusion
xvi) Any other applicable requirement

Note: Any other manufacturer or user declared parameter(s) may be identified and tested.

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

5) Research Methodology: -

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

7) Requirement for the CVs:-

Minimum graduate in textile technology or textile engineering or textiles chemistry or fibre science and technology or manmade fibre technology.

8) Timeline and Method of Progress Review :-

The duration of the project is **150 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 45 days	Literature review, desktop study, collection of data and information Note : - The plan for visit and collection of samples shall be discussed and finalized with nodal officer after literature survey and desktop research.
46 to 90 days	**MIDTERM REVIEW** Visit to manufacturer, user, testing lab Collection of data and information and collection of samples
91 to 135 days	Testing of samples (except long duration test with testing time more than 30 days) preparation and submission of draft report to BIS
136 to 150 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, acedamia, user, regulator/ministries.

10) Nodal Officer

In case of queries/clarification, Shri Dharmbeer, Scientist D and Member Secretary of TXD 33 may be contacted on txd@bis.gov.in, 011-23231282, 9910825544.