TERMS OF REFERENCE FOR THE R&D PROJECT

1. TITLE Study of constructional, performance and safety requirements for school bags.

2. BACKGROUND

2.1 A school bag is a type of bag used by students to carry books, notebooks, stationery, and other school supplies. School bags come in various sizes, styles, and designs to accommodate different needs and preferences. They typically feature multiple compartments and pockets for organizing items. When choosing a school bag, factors such as durability, comfort, and capacity are important considerations.

2.2 Backpack-type school bags are considered to be more comfortable and convenient to handle. A variety of materials are used in school bags for outer fabric, padding, mesh fabric for the bottle compartment, and piping materials. Considering all these requirements, it becomes essential to revise the existing Indian standard, IS 10228:1982, '*Specification for School Bags*', for inclusion of all the major varieties of school bags along with their performance requirements in the current market scenario. This comprehensive revision aims to enhance the standard's relevance in today's context.

3. OBJECTIVE

To collect technical data for constructional parameters, performance, and safety requirements of school bags from primary and secondary sources of information.

4. SCOPE

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

- International and Indian standards 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 (MSME and large-scale), testing infrastructure and organized buyers of school bags in the country.

c) Collection of import and export data, type of standards and regulations being followed by domestic manufacturers, comparative analysis of these standards and regulations.

d) Undertake a minimum of six visits to Large (preferably two visits) and MSME manufacturers and collect information on the following aspects:-

i) The types/grades of raw materials being used
ii) Manufacturing process and in-process controls being exercised during manufacturing
iii) Varieties being manufactured (in terms of material used, surface coatings)
iv) Standards and test methods being followed
v) Testing infrastructure available
vi) Post-manufacturing quality check/control
vii) Sampling plan being followed
viii) Marking and labelling of the product
ix) Packaging practices being followed
x) Sustainability practices [sustainable raw material, energy-efficient processes and methodologies, renewable energy sources, 3Rs (Reduce, Reuse and Recycle), waste management and disposal mechanisms]
xi) 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 a visit is not carried out) shall be collected by circulating a suitable questionnaire covering the above information through email or any other digital means.

e) Undertake a minimum of two visits to organized buyers and two visits to testing labs (one govt. and one private (accredited as per IS/ISO/IEC 17025) to collect information, including but not limited to the following:

Organised buyer

i) Specifications/Standards /Regulations being followed.
ii) Compliance verification 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) Test methods being followed.
iii) Testing infrastructure
iv) Focused group discussion on testing related issues, challenges being faced and suggestions.

The feedback from other organized buyers and labs (govt and private) where visit is not carried out shall be obtained through suitable questionnaires covering the above information.

f) Collection of a minimum of two samples of each variety of school bags from the six factory visited and carry out testing from two labs ((1 Govt Lab and 1 Pvt. Lab) accredited as per IS/ISO/IEC 17025) for parameters such as but not limited to areal density of base fabric and interliners (GSM), breaking and tear strength of fabric, dimensions of compartments; breaking strength of shoulder

strap, top handle; mesh size and dimensions of water bottle pocket, zippers performance requirements and chemical safety requirements along with material specifications and thickness of padded foam.

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

5. RESEARCH METHODOLOGY:

i) Collect and analyze the data/information as specified in the scope [4 (a), (b) and (c)].
ii) Visit manufacturers, organized buyers and labs and collect data/information as specified in the scope [4 (d) and (e)].
iii) Collect and test the samples as specified in the scope 4 (f).
iv) Analyze the data/information and prepare a comprehensive project report.

6. EXPECTED DELIVERABLES:

a) 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, a testing report, focused 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 man-made fibre technology and leather engineering.

8. TIMELINE AND METHOD OF PROGRESS REVIEW: The timeline for the completion of the project is 180 days from the date of award of project.

Timeline	Method of progress
0 to 30 days	Literature review, desktop study, collection of data and information Note – The sampling plan for visit and collection of samples shall be discussed with the nodal officer after literature survey and desktop research.
31 to 90 days	Visit to manufacturer, user, testing lab and collection of samples, an interim progress report shall be provided by the proposer.
91 to 150 days	Testing of samples (except long duration test with testing time more than 30 days) Preparation and submission of first draft report

151 to 180 days	Submission of the final project report.

9. SUPPORT FROM BIS:

BIS will provide access to latest available editions of Indian standards and/ or international standards relevant to the project, on request.

10. NODAL POINT

Gourav Mishra, Member Secretary, TXD 20

E-mail: txd@bis.gov.in