

## **Terms of Reference for Research Project**

### **(for Leather , Tanning Materials And Allied Products Sectional Committee CHD 17 under Chemical Department of BIS)**

#### **1 Title:**

Study on the performance requirements of various types of leathers used for making volleyball.

#### **2 Background:**

Historically, leather has been a fundamental material for volleyball production, known for its unique properties such as durability and softness, providing players with the ideal balance of control and performance.

BIS has published IS 4191, Specification for leather for volleyball which prescribes the requirements, and the methods of test for chrome tanned and vegetable tanned leather for volleyball. The standard was framed to assist the tanners to offer a suitable leather to the sports goods industry and to help in selecting a material of choice controlled by the conditions of national sports or the export market needs.

With an increasing focus on sustainability, and environmental concerns, researches are delving for innovative methods of leather sourcing, tanning processes, and treatment techniques, and a need was felt to commission a research project for undertaking an in-depth and incisive study to determine the performance parameters of the various types of leather (in addition to chrome tanned and vegetable tanned leather), such as synthetic leather, as well as the various processing techniques being used to ensure a more contemporary and environmentally conscious approach to volleyball manufacturing from leather.

#### **3 Objective:**

To collect relevant data and information from both primary and secondary sources regarding the performance requirements of the various types of leathers used for making volleyball, which will address the challenges being faced in the current standard.

#### **4 Scope:**

**4.1** Undertake comprehensive study and comparative analysis of the available literature on the characteristics and requirements of various types of leather used in volleyball manufacturing, from its source and treatment processes to its performance and sustainability, which will inter alia include any international standards, research papers published, study conducted by any industry or any other organization on the subject. The study shall also include information on any new and additional test methods being used for testing the various types of leathers used for making volleyball.

**4.2** Collection of scale wise (Large, Medium, Small, Micro) manufacturing database for different types of leather used for making volleyball available in the country.

**4.3** Identification of the countries which are exporting/importing different types of leather used for making volleyball, and studying the technical regulations/standards which are applicable in these countries.

**4.4** Collection of data regarding the testing facilities and various methods of test available in the country for different types of leather used for making volleyball.

**4.5** Visit to two manufacturing units each from Large, Medium, Small and micro scale and 2 laboratories (preferably one government and one in private sector) to study the manufacturing, different processing techniques, and requirements tested for different types of leathers used for making volleyball, unless the manufacturing database indicates otherwise.

**4.6** During literature survey and visits to manufacturing units, information on the following parameters shall be collected:

- (i) Different types of leather used
- (ii) Manufacturing processes
- (iii) In process quality controls
- (iv) Manufacturing facilities
- (v) Parameters tested
- (vi) In-house test facilities and test methods followed
- (vii) Marking and labelling
- (viii) Packaging
- (ix) Finished materials quality parameters tested
- (x) Sustainability practices followed [energy consumption, renewable energy sources, sustainable practices, 3Rs (Reuse, Reduce and Recycle), waste management and disposal mechanisms, steps taken to reduce carbon footprints], future plans.

**4.7** Preparation and submission of report on the all the parameters covered in the scope.

## **5. Research Methodology:**

The following research methodologies shall be followed:

- 5.1** Study the literature in respect to the Scope and analyze it.
- 5.2** Collection of information through structured questionnaire and contacting the relevant organizations (e.g. Council for Leather Exports) and associations (Industry/ user associations) in respect to the scope
- 5.3** Collection of data regarding the manufacturing database in the country
- 5.4** Visits to industry and laboratories for observing manufacturing facilities, processes and testing facilities.
- 5.5** Focussed discussion with the Quality Control team through a structured questionnaire/ format.
- 5.6** Collection of sampling during the visits to industries as per sampling plan.

- 5.7** Testing of samples collected during the visits and submission of the analyzed results.  
(Samples shall be tested in BIS recognized laboratories/ laboratories of national repute).
- 5.8** Comprehensive and concise reporting

## **6. Sampling Plan**

- 6.1** Preferably visit to 2 industries each of large, medium, small scale (unless the manufacturing database indicates otherwise) to understand and collect data from the manufacturers and organizations involved in manufacturing of different types of leather used for making volleyball.
- 6.2** Preferably visit to 1 govt and 1 private lab (preferably NABL accredited or BIS recognized lab) to have information on characteristics tested and methods of tests used.

## **7. Deliverables:**

- 7.1** Study report consisting of outcomes of the study covering all the aspects of the scope shall be submitted in both digital and paper form.
- 7.2** Along with the final report, the survey formats and responses, questionnaires, results of testing, report of visits, other relevant documents/ information shall be appended.

## **8. Delivery Milestones and Review Process**

- 8.1** The duration of the project shall be three months.
- 8.2** An interim report indicating the review of the literature, desktop research and sampling plan shall be submitted in 15 days from award of the project.
- 8.3** Draft report shall be submitted by the end of two months from award of the project. This report may not wait for receipt of final test reports of samples.
- 8.4** Final report shall be submitted within 90 days.

## **9. Support from BIS:**

BIS will provide access to available international standards required for the project as per the requirement identified by the proposer and on request.

## **10. Nodal Point**

Ms. Preeti Prabha, Scientist C & Member Secretary, CHD 17 may be contacted for more clarification on the R&D project ([chd17@bis.org.in](mailto:chd17@bis.org.in))