

## TERMS OF REFERENCE FOR THE R&D PROJECTS

*(Sports Goods Sectional Committee, PGD 41)*

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**1. Title of the Project:** Study of different grades and different types of Abdomen Guards used in sports

### **2. Background:**

**2.1** An abdominal guard is a protective equipment worn by athletes in various sports to safeguard the genital and abdominal area from potential injuries. The primary function of an abdominal guard is to prevent injuries to the sensitive and vulnerable areas of the body. Injuries to the groin and abdominal region can be extremely painful and may result in long-term damage if not adequately protected. It's essential for athletes to choose the right type and size of abdominal guard for optimal protection. The fit should be snug but comfortable to ensure that it stays in place during play.

**2.2** There is an Indian Standard IS 6974 : 1973 “Specification for Abdominal Guard for sports use” which specifies the material, construction, workmanship and test requirement for the product. This project is aimed at upgrading this specification by inclusion of new grades which are currently being used in the sports industry. This standard can be accessed from <https://standardsbis.bsbedge.com/>

### **3. Objective:**

To collect relevant data and information from both primary and secondary sources in regard to quality requirements (chemical, mechanical and physical properties) of different types and grades of abdominal guard used in sports industries.

### **4. Scope**

1. Study the available literature like national and international standard such as ASTM, JIS, EN, ISO etc available on the subject, research papers, any study conducted by other organisations, companies' brochure. Identify the grades, their chemical, mechanical and physical properties and any other requirements which can be included in the standard.
2. Collect data of the manufacturing base of the product.
3. Visit the manufacturers of the product and get the information on the following:
  - i. Types of raw material used;
  - ii. Varieties/grades of the product manufactured;
  - iii. Quality parameters (chemical, physical and mechanical properties) of different grades;
  - iv. Manufacturing process and important aspects that need to be included in the standard;
  - v. Safety requirements, test facilities and test methods used;
  - vi. In process quality checks;
  - vii. Marking and labelling being done;

- viii. Packaging requirement;
  - ix. Addressing sustainability in processes such as using energy efficient process, using renewable energy sources, recycling and reuse; and
  - x. Waste recycling.
4. Check the quantity of the product imported and exported and countries with which the trade for this product is occurring. Also check if any technical regulations exist for this product in these countries. Take data of the foreign specification as per which the product is being imported or exported.
  5. Identify the organised users of the product and take data of the quantity being used by them, specification used, check for the test certificates received by them and study the physical and mechanical properties mentioned in the TC. Also understand from the user the main properties required by them in the product.
  6. Prepare a comprehensive project report incorporating the points mentioned above.

### **5. Methodology:**

1. Study the literature and analyse the findings.
2. Visit the manufacturing unit and
  - a. Observe the manufacturing process,
  - b. Examine in-process control measures,
  - c. Conduct focussed group discussion with quality personnel
  - d. Collect the data as mentioned in the scope through a questionnaire.
3. Visit laboratories and make report on (If available)
  - a. Test equipment required
  - b. Test method being used
  - c. Testing charges
  - d. Testing time required.
4. Visit the identified importers and exporters and collect data as mentioned in the scope through a questionnaire.
5. Visit the users of the product and collect data as mentioned in the scope through a questionnaire.
6. Analyse the data and test reports from diverse sources and include the same in the project report.

### **6. Sampling plan:**

1. Two manufacturers from large, small and micro scale each shall be visited.
2. Three samples for each grade shall be tested.
3. One user organization of the product shall be visited.

### **7. Deliverables:**

1. Final project report, in hard copy format as well as in soft copy, covering all aspects mentioned in the scope.

2. Questionnaire, discussion, visit reports, test reports to be appended with the final project report

#### **8. Timeline and Method of Progress Review:**

The duration of the project is 3 months from the date of award of the project. The proposed indicative timeline stage-wise is given below:

<b>SI No.</b>	<b>Stage</b>	<b>Time from date of award of project (cumulative)</b>
1	Literature review and identification of manufacturing base, testing laboratories, user/user industry, and discussion with BIS for the finalization of sampling plan	1 month
2	Visit to manufacturers, testing laboratories, users and importers and exporters and data collection	2 month
3	Preparation and submission of first draft report to BIS	2.5 month
4	Submission of final project report	3 month

Note : The proposer may submit the draft report to BIS without waiting for test report from independent laboratories if the test is of long duration test .

#### **9. Support BIS will Provide:**

- National /international standard relevant to the project