

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the Project:** Study the Performance requirements of Hair Dryers.

2. **Background:**

- Indian Standard, IS 7154:1994 covers the performance of hair dryers in which the performance is measured by “**Air Delivery**” of the appliance.
- However, it has been observed that relying solely on air delivery is not sufficient to accurately predict the performance of a hair dryer. There are several other crucial parameters that must be considered, such as **the outlet air temperature, air flow rate, and temperature uniformity.**

A hair dryer's performance should be evaluated based on a combination of these parameters. If the air flow rate is high but the outlet air temperature is low, the appliance will not produce the desired results. Conversely, higher air temperatures can cause damage to the hair. Additionally, the presence of temperature non-uniformity in the outlet air will also affect the effectiveness of the hair dryer.

- Therefore, this research and development project aims to delve deeper into these performance requirements and identify ways to improve the overall performance of hair dryers, taking into account factors beyond just air delivery. By addressing these additional parameters, the goal is to enhance the functionality and usability of hair dryers, ensuring they deliver the desired results while prioritizing hair health and safety.

3. **Scope:**

- a. **Literature Survey** - Conduct an extensive study and comparative analysis of existing literature, research papers, international standards, and any other published information related to performance of Hair dryers.
- b. **Manufacturing Facility** - Evaluate the level of manufacturing bases in the country to understand the capabilities and quality of production facilities.
- c. **Study of Import – Export data-** Analyze import and export data of Hair dryers in India to gather insights into market trends, demand, and potential for growth.
- d. **Testing Infrastructure** - Assess the testing infrastructure in the country to determine the availability and adequacy of facilities for conducting product testing and quality assurance.
- e. **Visits to Manufacturing facilities:** Visit two manufacturing facilities for each category (small, medium, and large) of Hair dryers available in the country to observe the production processes, technology used, and overall manufacturing capabilities.

The study will focus on understanding important parameters:

- i. Types of Raw materials/components used.
- ii. Varieties/grades manufactured

- iii. Quality parameters (Performance requirements)
- iv. Manufacturing process,
- v. Safety requirements
- vi. In process quality checks
- vii. Test facilities and test methods used
- viii. Marking and labelling being done
- ix. Packaging requirement
- x. Tests being undertaken
- xi. Testing facilities in the plant

- f. **Visits to Laboratory facilities :** Visit two laboratory facilities available in the country to examine their testing equipment, capabilities, and expertise in relation to Hair dryers.(Preference shall be given to BIS labs wherever applicable)
- g. **Collection of Samples and Independent testing:** Collections of 5 random samples from different manufacturers from the market and its testing for generation of test data for important safety and performance requirements .
- h. **Collection of User feedback-** Visit the users of the product and collect data as mentioned in the scope through a questionnaire.
- i. **Study of Sustainability Aspects:** The focus of this study is to collect feedback regarding energy efficiency aspects, use of renewable energy sources, recycling of materials, waste disposal process, and management.
- j. Prepare a comprehensive project report incorporating the points mentioned above.

4. Research Methodology:

The project will involve the following research methodologies:

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.
 - e. Draw samples of the grades and get it tested in BIS approved laboratories
3. Visit laboratories and make report on
 - 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.

5. Expected Deliverables:

- a) A detailed analytical report covering all the aspects referred in the scope.
- b) Questionnaire, discussion, visit reports, test reports to be appended with the final project report

6. Timeline and Method of Progress Review:

The duration of the project is 5 months from the date of award of the project. The proposed indicative timeline stage-wise is given below:

| Sr No | Stage | Time from date of award of project (cumulative) |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 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 | 3 months |
| 3 | Preparation and submission of first draft report to BIS | 4 months |
| 4 | Submission of final project report | 5 months |

7. Support BIS will Provide:

- BIS will provide access to latest editions of standards, required for the project.
- Access to testing facility available at BIS laboratories, if available.