TERMS OF REFERENCE FOR R&D PROJECT

Eye nuts with collar for lifting purposes

1. Title
Study of latest technological developments and practices in the life cycle of Eyenut with Collar for lifting purposes.

2. Background
2.1 Eye nuts with collar sare widely used in various industries for lifting and moving heavy loads.

2.2 IS 4178 : 1967 - Specification for Eye Nuts with Collars has been published by BIS which covers requirements for Eye nuts with Collar for lifting purposes. This project is aimed at upgrading this specification by inclusion of the latest technology and practices which is currently being used in the Lifting equipment industry. This standard can be accessed from https://standardsbis.bsbedge.com/.

3. Objective
To collect relevant data and information from primary and secondary sources for latest technological upgradations and practices covering Terminology, Material, Dimension, Manufacture, General Requirements, Tests, Inspection, Marking, Documentation, etc for Eye Nuts with Collars.

4. Scope
4.1 Study the available literature like national and international standards such as ASME, ASTM, JIS, EN, ISO etc available on the subject, research papers, any study conducted by other organisations, companies' brochures.

4.2 Collect data of the manufacturing base of the product.

4.3 Visit the manufacturers of the equipment and get the information on the following:

a) Types of Raw material used
b) Varieties/grades manufactured
c) Terminology
d) Quality parameters
e) Design
f) Manufacturing process
g) Safety requirements
h) In process quality checks
i) Dimensions
j) Test facilities and test methods used
k) Inspection
l) Marking and labelling being done
m) Packaging requirement
n) Tests being undertaken
o) Testing facilities in the manufacturing plant
p) Documentation
q) Disposal

r) Addressing sustainability in processes such as using energy efficient processes, using renewable energy sources, recycling and reuse.
s) Waste recycling

4.4 Identification and visit to the laboratories as per the sampling plan.

4.5 Check the applicable regulatory requirements related to the product in the country.

4.6 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.

4.7 Identify the users of the product and take data of the quantity being used by them, specification used, maintenance and inspection, periodic in-house and outsourced testing, breakdown, etc. Also understand from the user the main properties required by them in the product.

4.8 Prepare a comprehensive project report incorporating the points mentioned above.

5. Research Methodology

5.1 Study the literature and analyse the findings.

5.2 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.

5.3 Visit laboratories and make report on
a) test equipment required
b) test method being used.

5.4 Visit the identified importers and exporters and collect data as mentioned in the scope.

5.5 Visit the users of the product and collect data as mentioned in the scope.

5.6 Analyse the data and test reports from diverse sources and include the same in the project report.

5.7 Developing and circulating questionnaires for obtaining data from stakeholders.

6. Sampling Plan

A sampling plan to be devised covering visits to manufacturers from 2 large as well as 2 MSME scale. Visit to 2 users of the product, preferably from different sectors, shall also be included in the sampling plan. Dedicated testing laboratories, one from government and one from private sector and R&D laboratories on the subject to be identified and included in the sampling plan. Visit to importers and exporters also to be included in the plan. The proposed plan to be submitted to BIS for approval.

7. Deliverables

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

7.2 Comparative Statement on parameters as mentioned in **4.3** while going through literatures as per **4.1**.

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

7.4 In case of delay in submission of the final draft report, the justification shall be given by the project proposer for consideration by the Sectional Committee.

8. Timeline

Admissible duration of the project is upto 6 months from the date of award of the project. The proposed indicative timeline stage-wise is given below:

Sl No.	**Milestones**	**Timeline**
a	Literature review and identification of manufacturing base, testing laboratories, user/user industry, and discussion with BIS for the finalisation of sampling plan	1 month
b	Visit to manufacturers, testing laboratories, users and importers and exporters and data collection	2 months
Mid-term review of the progress of the project		
c	Preparation and submission of first draft report to BIS	2 months
d	Submission of final project report	1 month
	Total	**6 months**

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

9. Support BIS will Provide:

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

10. Nodal Technical Committee of BIS

Cranes, Lifting Chains and Related Equipment Sectional Committee, MED 14
(Email: med@bis.gov.in)
Member Secretary - Mr Naveen K, Scientist 'D', Mechanical Engineering Department, Bureau of Indian Standards