TERMS OF REFERENCE FOR THE R&D PROJECT
(Plastics Sectional Committee, PCD 12 under Petroleum, Coal and Related Products Division Council, PCDC)

1. **Title of the Project**: Study on Safety and quality aspects of Acrylic Acid copolymer, its various applications and testing methodologies.

2. Background

2.1 Acrylic acid copolymers are a class of polymers derived from acrylic acid, a versatile organic compound. These copolymers are formed through the polymerization of acrylic acid and one or more additional monomers, resulting in a chain of repeating units with diverse properties. The incorporation of different monomers allows for the customization of the copolymer's characteristics, making them suitable for various industrial applications.

2.2 Their properties can be tailored through the choice of monomers, making them valuable components in various products and processes. Acrylic acid copolymers play a crucial role in various industrial applications, ranging from adhesives and sealants to coatings and water treatment formulations. The uses and application of acrylic acid copolymer is increasing in the India with the changing times.

2.3 As there is no Indian Standard on the subject, the need for standards on acrylic acid copolymers is paramount for quality assurance, compatibility and performance, safety and environmental concerns, global trade and consumer confidence. Therefore, it is important that a thorough analysis of its manufacturing process, applications/uses and performance characteristics based on the applications is done. Data gathered from the analysis will help in formulation of Indian Standard on acrylic acid copolymers.

3. Objective

To collect and analyse the data from primary and secondary sources for safety and quality aspects of acrylic acid copolymer used for various applications and testing methodologies.

4. Scope

4.1 Undertake extensive and intensive examination of the available literature on acrylic acid copolymer including international standards, if any, research papers, SOP’s and guidelines issued by regulatory bodies and any study conducted by any organization or any other available sources.

4.2 Identify and collect the data on the manufacturers of acrylic acid copolymer available in the country in various categories i.e. large, medium, small, and micro units.

4.3 Gather import-export data and identify importers of the material in India. Based on the gathered information, study the regulations and standard followed in the exporting countries.

4.4 Identify and collect the data on the users of acrylic acid copolymer in the country.

4.5 Identify and collect the data on the laboratories involved in the testing of acrylic acid copolymer.

4.6 Carry out visits to manufacturing facilities, users, laboratories to collect information on the subject through a structured questionnaire/ discussions/ witnessing the various processes.

4.7 Carry out testing on the samples of Acrylic Acid copolymer collected from manufacturers and importers against their declared parameter.

4.8 Study and comparative analysis of various documents/literature gathered from different sources.

4.9 Prepare analytical report covering the entire scope.

5. Research Methodology

5.1 Literature review available from primary and secondary sources.

5.2 Contact the relevant organizations, industry associations to gather the information on the subject.

5.3 Collect feedback from industries, users, labs through questionnaires. The questionnaires to be circulated to all the available industry, users, labs.

5.4 Visits to industries (of each category), users, labs to observe the facilities and processes followed. At least two industries each from large, medium, small, micro, users, laboratories (Public and private each) to be visited, if available. However, the number of visits to be finalized after gathering the information on available industries, users, and labs.

5.5 During the industry visit, if available, the information mentioned below to be gathered:

a) Raw material used;
b) Variety of products manufactured;
c) Manufacturing processes followed for different grades;
d) In process quality controls and checks;
e) Requirements for Quality and safety parameters;
f) Testing methodologies used;
g) Finished products quality checks;
h) Packing, Labelling, and marking requirements;

i) Sustainability impact of the processes involved i.e. sources of energy used (renewable/non-renewable), Energy consumption, measures taken, if any to ensure energy consumption, impact of the manufacturing processes involved on the environment,

j) Initiatives being taken to ensure 3R's.

k) Focused group discussion in structural format.

5.6 During Lab visit, if available, the following information to be gathered:

a) Testing methodologies followed;
b) Equipment's used.
c) Focused group discussion.

5.7 During user industry visit, if available, the following information to be gathered:

a) Products used;
b) Parameters used for quality check;
c) Focused group discussion.

5.8 Sampling plan to be finalized in consultation with BIS after stage 1.

5.9 Analyze the findings from the literature review, visits.

5.10 Collection and testing of sample at the labs (preferably BIS recognized labs, if available).

6. Deliverables

6.1 Project report, in hard copy and digital formats, covering all aspects mentioned in scope.

6.2 Questionnaires, discussion and visit reports, test reports, to be appended with the project report.

7. Timeline and Method of Progress Review

7.1 Final report to be submitted within 4 months from the date of the award of the project.

7.2 Stages for Review:

7.2.1 Stage I – At the end of 4th week, allottee shall prepare the following:

a) Literature review carried out and summarized report;
b) Identified manufacturers and importers; and
c) Format of questionnaire for manufacturers and importers;
d) Laboratory where testing is to be carried out; and
e) Visit and sampling plan.

7.2.2 Stage II – At the end of 12th week, project allottee to submit draft report having information as mentioned in the scope.

NOTES:

1. Sectional Committee will evaluate the draft report and provide feedback / recommend changes, if required, within 1 week.
2. Awardee may forward the draft report to BIS without waiting for test report, if it's a long duration test.

7.2.3 Stage III – At the end 16th week, project allottee to submit final report incorporating recommendations/feedback of Committee.

7.3 Sectional committee will evaluate the final report and take decision for acceptance and recommend release of balance funds.

7.4 The project allottee shall comply to the provisions given in the BIS guidelines for Research & Development Projects for Formulation and Review of Standards, i.e., doc no. SCMD/R&D Guidelines/20230909.

8 Support from BIS

8.1 Letters from BIS to manufacturers and industry associations introducing the awardee.

8.2 Access to Indian and International Standards.

8.3 Member secretary of the Plastics Sectional Committee, PCD 12, Shri Shivam Dwivedi shall be the Nodal point from BIS. His email id is pcd12@bis.gov.in.