

## TERMS OF REFERENCE FOR THE R&D PROJECT

1. **Title:** Study and Critical Analysis of Different Preparation Methods of Flexographic plates

2. **Background:**

2.1 This project is related to the Graphic Art Technology Sectional Committee (MSD 6) which falls under the purview of the Management System Divisional Council (MSDC) within the Bureau of Indian Standards (BIS).

2.2 Flexographic (Flexo) printing's versatility, efficiency, cost-effectiveness, and adaptability to different printing substrates make it a crucial and preferred printing method for various industries. As technology continues to advance, flexo printing is likely to remain an essential part of the printing landscape.

2.3 Three basic types of materials used in flexographic printing plate production are; rubber plate formulations, liquid photopolymer media and solid-sheet photopolymers. In the 1970s, the molded rubber plate was replaced by photopolymer printing plates. The introduction of photopolymerization in the plate-making industry has led to a remarkable increase in print quality and has helped the growth of the flexographic printing industry. Today the most commonly used plate material is the solid-sheet photopolymer material.

2.4 As the technology for flexographic printing continues to evolve, both quality and efficiency are improving. In order to remain competitive in the marketplace, flexographic printers must stay informed about the latest developments. The challenge for plate manufacturers has always been to create a more environmentally friendly plate without losing the benefits and advantages of quality and efficiency.

2.5 The major components in the photo-sensitive layer are the binder, monomer and photo-initiator. The binder also embeds the monomer and photo-initiator in the raw state and serves like a matrix. The binder is usually a solid thermoplastic elastomeric block copolymer which constitutes the backbone of the imaged plate. The greatest advances in flexographic printing have been in the area of photopolymer printing plates, the plate material and the method of plate preparation.

2.6 All the above developments allowed Flexo to grow & dominate production in the many print sectors such as labels & packaging and even move into new applications such as cartons. Recently, digital direct to plate systems support greater improvements in image reproduction, reducing the turnaround time from a computer to proofing, to press.

2.7 Printing industry has initiated various reforms in flexographic plate preparation methods to ensure effective print production. The project is envisaged to have a comprehensive review, assessment and stabilization of flexographic plate preparation methods with respect to all the stakeholders being involved in this area.

3. **Objective:**

- a) To have a comprehensive study and critical analysis on the various practices of flexographic plate preparation methods followed in printing industry
- b) To collect feedback from all the stakeholders on both the water washable and chemical washable plates
- c) To identify the possible challenges while using water washable plates
- d) To carry out industrial testing of the flexo plates for optimal printing output on various printing substrates.

#### 4. Scope :

- a) To study the various international standards available on the flexo plate preparation methods.
- b) To identify water and chemical washable flexographic plate preparation practices used by the industry and the various issues involved during the plate preparation.
- c) To identify the gap areas in relation to the present flexo printing plates preparation methods.
- d) To carry out industrial testing with specified parameters for water washable flexographic plates and chemical washable flexo plates for optimal printing output on various printing substrates.
- e) To propose a measure to enhance the efficiency of water washable flexographic plates in terms of plate preparation method, plate life and print quality.
- f) The study shall include the best practices being followed by the flexography printing, internationally

#### 5. Research Methodology:

Suggested methodology for the proposed R&D should be as follows:

**5.1 Literature Review** – Undertake literature review on flexo plate production control including but not restricted to the following and provide comparative analysis:

- Indian and International standards;
- Research articles/papers;
- Any studies being conducted by any organization; and
- Any other possible sources.

#### 5.2 Field visit –

- a) Identification of 5 prominent manufacturers/suppliers of flexo photopolymer plates and.
- b) Identification of 8 printing establishments and testing facilities available with them.
- c) Visit the Flexo industries engaged in preparation of various in-house flexo plates.
- d) In-depth study of the practices followed in flexo printing presses towards plate preparation and quality control aspects involved during the platemaking process.
- e) Identification and listing of equipment and quality control tools being used by flexo presses during flexo platemaking.
- f) Conduct focused group discussion with quality control personnel involved in plate preparation and testing on different parameters and issues involved during different types of flexo platemaking.

**5.3 Testing** – Testing of digital flexo plate on different substrate (paper, plastic, metal) in printing industry where applicable to collect information relating to plate composition, plate characteristics and plate making process attributes for various printing applications.

**5.4 Data collection** – data shall be collected on the nature, composition characteristics and the targeted applications of flexo plates from prominent flexo plate manufactures and suppliers with in country (atleast 5). Comparison shall be made in terms of plate runnability and printability with relation to water washable and chemical washable plates on various printing substrates.

**5.5 Analysis and report preparation** – With the collected data from the plate manufacturers and industrial testing of these plates for both the plate processing methods on different printing substrates, analysis shall be carried out and the final report shall be prepared.

**5.6** Based on information collected and analysis done project report shall be submitted to BIS, for development of standard in this domain area.

**6. Outline of the tasks and final deliverables expected from the Proposer(s):**

6.1 Final project report, in hard copy format as well as in soft copy (editable format), covering all aspects mentioned in the scope.

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

**7. Delivery Milestones and Review Process**

Total Estimated Time is 6 months from the date of award of the project.

The project will follow the following timeline:

**7.1 Stages for Review:**

**7.1.1 Stage I:** At the end of 1st month, preparing a comprehensive plan identifying the following:

- i. Details of literature review carried out and summarized report;
- ii. Identification of plate manufacturer and industry, users and different stakeholders to be visited.
- iii. Information to be collected through interactions from the above-mentioned stakeholders and visits to be carried out;

Member Secretary will evaluate the plan and provide feedback, if any.

**7.1.2 Stage II:** At the end of 4th month, proposer shall submit draft report with the following information:

- i. Reports of visits carried out to different organizations
- ii. Details of the data collected while interaction with different stakeholders including tests carried out
- iii. Analysis of data and correlation with the findings.

The concerned Sectional Committee will evaluate the draft report and provide feedback/recommend changes, if required.

**7.1.3 Stage III:** At the end of 6th month, proposer shall submit final study report with all the details and analysis of test reports, studies and surveys.

## **8. Support from BIS**

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

## **9. Nodal Officer**

Mr. Ashish V Urewar, Sc. C/Deputy Director, MSD, BIS, may be contacted at [msd@bis.gov.in](mailto:msd@bis.gov.in) for any queries on the research project.