

ANNEX E

OPERATION OF FUNDS AND PROGRESS REPORT

1. Title of the Project: Development and validation of test method for determination of chlorinated organic carriers in textiles and textile products.	Project number: TXD 0065
2. Name & Address of Project leader: M P.Sathianarayanan	Date of Commencement: 28/06/2024

3. Details of Equipment Purchased (if any):

Name of equipment	Cost	Supplier	Date of purchase/ placing order for each item of equipment
Nil	Nil	Nil	Nil

NOTE - The equipment fund once fixed cannot be enhanced. Project leaders are advised to give authenticated estimates of the cost of equipment. Equipment should invariably be purchased within 1 month from the date of receipt of the fund and/or sanction letter.

4. Fund received - 2,94,970.0 _____.

5. Expenditure made in Rupees: (Please provide the details)

Expenditure	Amount	Taxes (as applicable)	Total
Manpower cost	33,540.0		
Consumables	90,490.0		
Equipment	nil		
Travel	10,220.0		
Others	49,162.0		
Grand Total	1,83,412.0		

6. Amount saved (if any) from the last instalment: Rs1,11,558.0__.

7. Date on which scheme will complete its normal tenure of months 6 month_____.

8. Whether extension beyond normal tenure has been requested. Yes /No.

➤ Still we are trying to complete in a given period of time.

If yes, justification for extension and programme of work to be completed. Also mention as to why the work could not be completed as per the original plan.

{Extension beyond normal tenure should be requested at the Project Monitoring Session before end of tenure (as given in ToR)}.

9. Constraints (if any) faced in the progress of work and suggestions to overcome them.

- Issues faced during the execution of R & D project and alternative proposal for approval of TXD 05 committee
- Please find the attached word file. We have to mention a few points then only we will get an extension. Otherwise utilization of funds within 6 months will be difficult.

10. Any deviation from original plan with its nature and cause.

➤ Nil

List of publication giving full bibliographic details accrued from this project (copies of the paper (s) should be enclosed).

➤ Work in progress

11. Summary of work done (200 words).

➤ July-August 2024

Required technical staff to work on the project has been allocated. Literature survey including international test method EN 17137 reviewed. Order has been placed to procure 30 COC standards (Certified Reference Materials) and a 60 meter GC MS column for standardization of COC, s. 26 CRM received and remaining 4 CRM and column is expected to receive in September/October starting week. Required chemicals, solvents, glass wares etc. intended. All materials will be received in September/October. 1000 ppm of individual standards prepared and standardization in GC MS is under progress. Personally, visited five NABL accredited laboratories (one Government and four private) having capability to do testing of Chlorinated Organic Carriers.

12. Proposed programme of work for the next month (1000 words).

- To develop a test method for determination of Chlorinated Organic Carriers in textiles and textile products.
- To validate the test method as per the validation protocol.
- Standardization of each isomer of COC,s by GC MS.
- Linearity.
- Repeatability and Reproducibility.
- LOD & LOQ.

13. Detailed Progress Report enlisting the objectives in beginning briefly (up to five pages maximum).

Title: Development and validation of test method for determination of Chlorinated organic carriers in textiles and textile products.

Project code: TXD-0065

Preamble

Chlorinated Benzenes and Toluene's generally called chlorinated carriers are a group of organic compounds having one or more chlorine atoms attached to either a benzene or toluene ring. Chlorobenzenes and Chlorotoluene's have diversified application in several industries including textile and footwear industries. Chlorinated carriers are typically used as intermediates or precursors in the manufacture of textile dyes and auxiliaries. It is also used in polyester dyeing as a carrier. Conventionally, polyester is dyed at high temperature (140-150⁰C) and high-pressure method. However, the same can be dyed near 100⁰C by using carriers. After dyeing, polyester materials are washed with water to remove unfixed dyes and carriers. However, trace amounts of carriers may remain as impurities in the final dyed materials. COC, s and their isomers have potential health hazards. These compounds are harmful and may induce liver malfunction, irritation to mucous membrane and skin. Due to the hazardous nature of these chemicals many leading apparel and footwear brands have banned the use of chlorobenzenes and chlorotoluenes in the production and manufacturing of their products. Pentachlorobenzene (PCB) and Hexachlorobenzene (HCB) are categorised as persistent organic pollutants. According to the Stockholm Convention, both these carriers have been banned globally. Some chlorobenzene and chlorotoluene can be very toxic to aquatic organisms at certain concentrations. Hence, chemical suppliers that require chemical

formulations are also required to comply with current ZDHC MRL limits of COC,s. Many of the EU regulations like Oeko Tex 100, GOTS, ECHA’s candidate list of substances of very high concern (SVHC) have restricted these substances. List of restricted chlorobenzene and chlorotoluene is given in Table-1. The limit value for sum of the chlorobenzene and chlorotoluene is 1.0 mg/kg. Though the list is exhaustive, only few common COC,s are reported in textiles.

Many commercial testing laboratories both in India and abroad are testing the content of COC,s either adopting international test method DIN EN/ EPA/ in-house developed test methods to cater their customers . At present there are no Indian/ISO standards to test COC,s for textile materials. Hence, in this R&D project, a validated test method will be developed and formulated the same as a new standard for BIS.

Table-1 List of restricted Chlorobenzenes and Chlorotoluenes

Substance	CAS- Number ^a
2-Chlorotoluene	95-49-8
3-Chlorotoluene	108-41-8
4-Chlorotoluene	106-43-4
2,3-Dichlorotoluene	32768-54-0
2,4-Dichlorotoluene	95-73-8
2,5-Dichlorotoluene	19398-61-9
2,6-Dichlorotoluene	118-69-4
3,4-Dichlorotoluene	95-75-0
2,3,6-Trichlorotoluene	2077-46-5
2,4,5 Trichlorotoluene	6639-30-1
Pentachlorotoluene	877-11-2
1,2-Dichlorobenzene	95-50-1
1,3-Dichlorobenzene	541-73-1
1,4 Dichlorobenzene	106-46-7
1,2,3 -Trichlorobenzene	87-61-6
1,2,4-Trichlorobenzene	120-82-1
1,3,5-Trichlorobenzene	108-70-3
1,2,3,4-Tetrachlorobenzene	634-66-2
1,2,3,5-Tetrachlorobenzene	634-90-2
1,2,4,5-Tetrachlorobenzene	95-94-3
Pentachlorobenzene	608-93-5
Hexachlorobenzene	118-74-1

Personally, visited five NABL accredited laboratories (one Government and four private) having capability to do testing of Chlorinated Organic Carriers. Interacted with testing staff and Sr. Managers and discussed testing method and methodology. During the visit none of the laboratories were conducting COC tests. Hence, witnessing of the test was not possible. However, during the interactive section, testing method, regulation being followed, list of restricted COC, s etc. were discussed. A twelve-point questionnaire was prepared and given to each lab and sought their feedback. Questionnaire and summary of the feedback from the entire five laboratories is given below.

Questionnaire

1. Since how long has the laboratory been testing samples for COC, s?
2. Is the test method covered under the scope of NABL accreditation? (Yes/No)

3. How many COC,s is there in the scope of NABL accreditation?
4. Which test method laboratory is following for the analysis of COC,s ?
5. Which instrument the laboratory is using to identify and quantify COC,s ?
6. During the last one year, how many samples were received exclusively for COC testing?
7. In how many samples COC and its isomers detected during the last two years?
8. Which are the chlorinated benzene and chlorinated toluene isomers commonly detected in textile materials?
9. Which are the textile materials (dyed fibre/yarn/fabric/leather/dyes/auxiliaries etc.) COC,s detected?
10. What is the laboratory's Method Detection Limit (MDL) for COC,s ?
11. Whether the laboratory has any positive COC samples for conducting QC check/ILC ?
12. What are the advantages of having a validated BIS test method for the analysis of COC,s in textile materials?

Feedback

- a) All the laboratories have been testing COC,s since more than four years.
- b) All the laboratories are having NABL accreditation for COC tests.
- c) Two laboratories are having the capability to test 21 COC,s and three laboratories are having the capability for testing 22 COC,s
- d) All the laboratories are following DIN EN 17137 standard test method for COC analysis.
- e) All laboratories are using GC MS for qualitative identification and quantification of COC,s
- f) None of the laboratories reported any positive sample during the last two years.

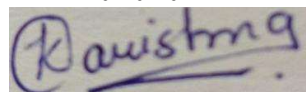
Signature of Project leader

Date:

Signature of Co-investigator

Karishma. Hemani

Date: 10/10/2024



Note: No column should be left blank; write not applicable (NA), wherever applicable.

UTILIZATION CERTIFICATE OF THE BOMBAY TEXTILE RESEARCH ASSOCIATION,
L B S MARG, GHATKOPAR (WEST), MUMBAI 400 086
"DEVELOPMENT AND VALIDATION OF TEST METHOD FOR DETERMINATION OF CHLORINATED
ORGANIC CARRIERS IN TEXTILES AND TEXTILE PRODUCTS"

For Government of India

Ministry of Consumer Affairs, Food & Public Distribution

BUREAU OF INDIAN STANDARDS (BIS)

For the Period 25.6.2024 to 31.8.2024 in respect of
 GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

1. Name of the Scheme : PLAN SCHEME
2. Whether recurring or non recurring grants : Recurring
3. Grants position at the beginning of the Financial Year :
 i.e (On 25.6.2024)
 - (i) Cash in Hand/Bank : Rs.2,94,970/-
 - (ii) Unadjusted advances : NIL
 - (iii) Total : Rs.2,94,970/-

4. Details of grants received, expenditure incurred and closing balances as on 31.8.2024.

(Figures in Rupees)

Unspent Balances of Grants received years [figure as at sl.no 3(iii)]	Interest earned thereon	Interest deposited back to the Government	Grant received during the year/period			Total available sanctioned funds (1+2=3+4)	Expenditure Incurred	Closing balances as per sanction (5-6)
			Sanction No. (i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
2,94,970/-	-	-	TXD 0065	25.6.2024	2,94,970/-	2,94,970/-	1,83,412/-	1,11,558/-
Grant-in-aid-General		Grant-in-aid-salary	Grant-in-aid-creation of capital Assets			Total Expenditure		
1,49,872/-		33,540/-	-			1,83,412/-		

*Note : Out of above Expenditure of Rs. 1,83,412/-, amount paid towards advance is Rs.78,681/-.

Details of grants position on 31.8.2024 :

- (i) Cash in Hand/Bank : Rs. 1,11,558/-
- (ii) Unadjusted Advances : NIL
- (iii) Total : Rs. 1,11,558/-



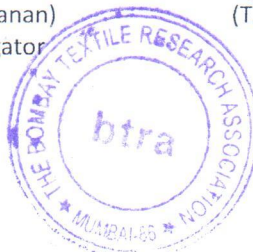
(J.S. Jani)
Administrative Officer

For: 

(M.P. Sathianarayanan)
Principal Investigator



(T.V. Sreekumar)
Director



Contd....2

Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned :

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with audited figures mentioned in financial statements/accounts
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under PLAN (Name : DEVELOPMENT AND VALIDATION OF TEST METHOD FOR DETERMINATION OF CHLORINATED ORGANIC CARRIERS IN TEXTILES AND TEXTILE PRODUCTS) and the scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure – I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure – II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure –II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date : 9/10/2024
Place : Ghatkopar, Mumbai

Signature



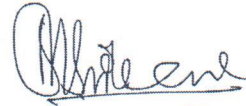
Name : J.S. JANI
Administrative Officer

Signature



Name : M.P. Sathianarayanan
Principal Investigator

Signature



Name : DR.T.V. SREEKUMAR
Head of the Organisation



Above figures are verified as per Books of Accounts

For Thakkar Thakkar & Co.
Chartered Accountants
FRN No.122085W



(Tushar V Thakkar)
Mem.No.040545
Partner



UDIN : 24040545BKFM BH2 672

THE BOMBAY TEXTILE RESEARCH ASSOCIATION
GOVT. OF INDIA, MINISTRY OF CONSUMER AFFAIRS
BUREAU OF INDIAN STANDARDS (BIS)
DEVELOPMENT AND VALIDATION OF TEST METHOD FOR DETERMINATION OF CHLORINATED ORGANIC CARRIERS IN TEXTILES AND TEXTILE PRODUCTS

Statement of Expenditure as on 31.8.2024

Particulars	Manpower		Consumables		Travel		Any other/ Overheads		Equipment		Total	
	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.
Budget												
(For 6 months)	99,360.00		7,00,000.00		20,000.00		1,63,872.00		-			9,83,232.00
1st instalment (30%) received	29,808.00		2,10,000.00		6,000.00		49,162.00					2,94,970.00
Expenditure upto 31.8.2024	33,540.00		11,809.00		10,220.00		49,162.00					1,04,731.00
100% Advance Paid			78,681.00									78,681.00
Total Expenditure Upto 31.8.2024	33,540.00		90,490.00		10,220.00		49,162.00		-			1,83,412.00
Balance as on 31.8.2024	-3,732.00		1,19,510.00		-4,220.00		-					1,11,558.00

Above figures are verified as per Books of Accounts.

For Thakkar Thakkar & Co.
Chartered Accountants
FRN No. 122085W



(Tushar V. Thakkar)
Membership No.040545
Partner

UDIN : 24040545 BIFN BHR692
Place : Mumbai
Date : 31/08/2024
SPW/-

For:

M.P. Sathianarayanan
Principal Investigator
Signature & date
Seal



Jignesh Jani
Administrative Officer
Signature & date
Seal



T.V. Sreekumar
Head of Institution
Signature & date
Seal

Issues faced during the execution of R&D project and its solutions

1. It is difficult to follow exactly as per the ToR of BIS because as per ToR
0-45 days : Literature review, desktop study, collection of data and information.
(These allocation days are perfectly okay)
45-90 days : Visit to testing laboratories , collection of data and information
(These allocation days are also okay)
90-135 days: Collection and purchase of samples, testing of samples, ILC with 5 NABL accredited laboratories.

Issues:

(After visiting 5 NABL accredited laboratories it was found that not a single laboratory is having a positive samples (please refer to my lab visit report). Purchasing samples from the market is also not possible due to non availability of positive sample, spiking of standard in textile materials may not give homogeneity to conduct ILC).

Solution: BTRA has to prepare disperse dyed polyester samples using low temperature carrier dyeing (COC as carrier) technique and homogeneity has to be assessed before sending for ILC.

135-150 days: Submission of report : (Okay)

Major issues: In this ToR there is no time allocation for method validation.

As per method validation protocol (linearity, precision, accuracy, LOD, LOQ, spike recovery, ILC) itself will take a minimum of two months.

Solution: Need two months extension without affecting the allocated budget.

2. We received the first inception amount (30% after deduction of 10% TDS) on 25/06/2024. So far no R&D project undertaken by BTRA, TDS has been deducted. Two emails sent to BIS from BTRA accounts departments seeking a clarification have not yet been addressed. As this is a short term R&D project, major expenditure (about 80%) will be incurred in the initial stage for purchasing CRM (COC standards), chemicals, reagents, set up of experiments etc. We have overspent the inception amount within three months.

Solution: Inception amount should have been at least 60-80% of total budget.

3. After receipt of the first inception amount, we have placed an order for COC standards (CRM) to a reputed supplier (OMC Chemicals). Since these standards are imported items, it took more than two months to receive the standards. Few standards are still pending and expected to be receive this month (October). These are beyond our control and may affect the time duration of the project.

Solution: Need two months extension (another justification mentioned in #1)

TERMS OF REFERENCE FOR THE R&D PROJECTS

[Chemical Methods of Test Sectional Committee TXD 05 under Textiles Department of BIS]

1) **Title of the project:** - Development and validation of test method for determination of Chlorinated Organic Carriers in textiles and textile products

2) **Background:-**

2.1 Chlorinated organic carriers are chlorinated organo benzenes, toluenes and their isomers. Chlorinated organic carriers (COC) are generally used :-

- i) As intermediates in the synthesis of other chemical substances as well as paint carriers and levelling agents
- ii) Included as impurities in chemical formulations of dyestuffs and solvents.
- iii) In garment and footwear supply chains and textile applications.
- iv) As a carrier during the dyeing process of synthetic fibers, especially polyester and polyester blends.
- v) As an intermediate in the synthesis of solvents and other chemical compounds with high melting points.

2.2 Chlorinated organic compounds are harmful and may induce liver malfunction, irritation to mucus membrane and skin as well as reproductive disorders. Some chlorobenzenes and chlorotoluenes can be very toxic to aquatic organisms at certain concentrations. In developed countries, leading apparel brands have banned/restricted the use of chlorobenzenes and chlorotoluenes in the production and manufacturing of their products.

2.3 Many commercial labs are doing the testing for Chlorinated Organic Carriers as per inhouse method (Solvent Extraction/GC-MS) or using other international standards such as BS EN 17137, EN 17137, DIN 54232 as per customer/user requirement. There is no Indian/ISO Standard on the subject for textiles and textiles products.

2.4 Given the potential health and environmental risk, it is imperative to develop reliable and accurate methods for the determination of chlorinated organic carrier. This R &D project will serve as a basis for development of a uniform standard on test method for chlorinated organic carrier.

3) **Objective**

To develop and validate test method for determination of Chlorinated Organic Carriers by Gas Chromatography Mass Spectrophotometry (GCMS) in textiles and textile products from primary and secondary sources.

4) Scope: -

- a) Undertake study and analyse the existing literature which include but not restricted to the following :-
 - i) BSEN, EN, DIN and other International Standard
 - ii) Regulation at International level
 - iii) Restricted chlorinated organic carrier compounds
 - iv) Standard operating procedures (SOPs)/guidelines of laboratories
 - v) Journals and research papers
 - vi) Any other relevant published information
- b) Collection of the database of testing infrastructure and users in the country.
- c) Undertake 2 visits to NABL accredited testing labs (one Govt and one private) having capability to do testing of Chlorinated Organic Carriers to collect information including but not restricted to the following: -
 - i) Witness the testing and understand the testing procedure
 - ii) Testing methods and regulation being followed
 - iii) Restricted chlorinated organic carrier chemicals being tested
 - iv) Technical data and information on scope, principle, Apparatus/Equipment, Reagents/Chemicals, Test specimen preparation, Testing procedure, Gas chromatographic determination/instrument diagram, Calibration, expression/calculation of results
 - v) Focused group discussion on testing related issues, challenges being faced and suggestion

The feedback from other labs (Govt and private NABL accredited) where visit is not carried out shall be obtained through suitable questionnaire covering above information.

- d) Provide technical data and information for development of test method in Indian Context based on literature survey, International Standards, laboratories practices, lab visits. The technical data shall include but not restricted to the following information: -
 - i) Scope
 - ii) Term and definitions
 - iii) Principle
 - iv) Apparatus/chemical reagents
 - v) Preparation of test specimen
 - vi) Testing, extraction and filtration procedure
 - vii) List of restricted chemicals
 - viii) Gas chromatographic determination/instrument diagram
 - ix) Calibration, expression/calculation of results
 - x) Test report format

The technical/scientific data collected shall not violate copy right/patent right (if any) on the proposed subject.

- e) Purchase 3 samples of different known impurity and carry out interlaboratory validation of the GC-MS method from 5 NABL Accredited lab.

Note - While sending the samples for interlaboratory test, either the samples may be spiked or may be purchased from Proficiency testing (PT) service provider with known quantity/limit (ppm) of impurity of chemical substance.

- f) Validation should include studies on linearity, precision, accuracy, limit of detection (LOD), limit of quantification (LOQ), and recovery rates. Validation shall cover a range of chlorinated organic carriers (chlorobenzenes and chlorotoluenes) commonly encountered in textiles and textiles products.
- g) Preparation of a comprehensive project report covering all the above information.

5) Research Methodology: -

- a) Collect and analyse the data/information as specified in the scope [4 (a) and (b)].
- b) Visit labs and collect data/information as specified in the scope [4 (c)].
- c) Prepare technical data, test the samples and validate the test method as specified in the scope [4 (d), (e) and (f)].
- d) Analysis the data/information and prepare a comprehensive project report.

6) Expected Deliverables: -

- a) Comprehensive report in soft/hard form covering all the aspects detailed in the scope of the R & D project.
- b) Questionnaire feedback, reports of visit, testing/validation results, focussed group discussion report, other relevant documents and information shall be appended to the project report.

7) Requirement for the CVs:-

The person shall be at least graduate in Textile Technology or Textile Engineering or Textile Chemistry or Fibre science and Technology or Manmade Fibre Technology or B.Sc. in Chemistry.

8) Timeline and Method of progress Review:-

The duration of the project is **150 days** from the date of the award of the project. The stagewise indicative timelines are as follows:-

Time line	Method of progress
0 to 45 days	<p style="text-align: center;">Literature review, desktop study, collection of data and information</p> <p>Note: - The plan for visit and collection/purchase of samples shall be discussed and finalized with nodal officer after literature survey and desktop research.</p>
45 to 90 days	<p style="text-align: center;">Visit to testing lab Collection of data and information</p>

	<p>Technical data/information on test method for determination of chlorobenzenes and chlorotoluenes (Chlorinated Organic Carriers)</p> <p>Note: - The test method shall be reviewed by the technical committee TXD 05 before purchase of samples and validation process.</p>
90 to 135 days	<p>Collection/purchase of samples</p> <p>Testing of samples/Interlaboratory validation of test of 3 different samples from 5 labs accredited by NABL</p> <p>Preparation and submission of draft report to BIS</p>
135 to 150 days	<p>Submission of the final project report.</p>

9) Support BIS will Provide:-

- a) All the relevant Indian Standards/ISO Standards or any other standards required during the project will be provided by BIS.
- b) Facilitate/introduction of the project leader/organization to relevant Industry and industry association, testing lab, institute, academia, user, regulator/ministries.
- c) Facilitate testing of samples in BIS Lab/BIS Recognized Lab.

10) Nodal Point

In case of queries/clarification, Shri Dharmbeer, Scientist D and Member Secretary of TXD 05 may be contacted on txd@bis.gov.in, 011-23231282, 9910825544.

**GUIDELINES FOR RESEARCH & DEVELOPMENT PROJECTS
FOR FORMULATION AND REVIEW OF STANDARDS
(First Revision)**

1 INTRODUCTION

Bureau of Indian Standards (BIS), as the National Standards Body of India is responsible for formulating Indian Standards for products, processes and services. In the pursuit of this endeavour, it has so far developed more than 22000 Indian Standards. Action Research and Research & Development Projects have always been part of the standardization process. However, there has been a growing realisation in the context of the increasing diversification, innovation and complexities in the manufacturing sector and evolution of services and also due to the fast pace of changes in the manufacturing and services landscapes, research & development projects have to be made an integral part of the standardization process. The idea is that in principle no standard should be developed without intensive and insightful research work, which is not confined only to the review of the existing literature and focus group discussions on the subject chosen for standardization, but also covers the detailed field level study of the existing processes and practices in product manufacturing and service delivery. This requires a large network of domain area experts to carry out the research & development work. The existing network encompasses only a small segment of experts, who are either associated with technical committees as members or belong to some R&D organizations. The Memorandum of Understanding with the premier educational institutions imparting technical and professional education opens the window to the opportunities to expand this network substantially by utilizing the intellectual capital that resides with the faculty and the research scholars in these institutions. This association is conceived not only as a way to promote research & development work necessary for standards formulation but also to enrich the research ecosystem in these educational institutions.

2 OBJECTIVES

Objectives of this Scheme are to:

- 2.1** support and commission research & development projects to generate knowledge, empirical data and insights that would help in formulating new standards and updating & upgrading the existing Indian standards;
- 2.2** expand the network of domain area experts to carryout research & development projects in the areas related to standardization and conformity assessment; and
- 2.3** enrich the research ecosystem in the educational institutions imparting technical and professional education.

3 RESEARCH & DEVELOPMENT PROJECTS

3.1 Research & development projects under these guidelines are described as follows:

A project aimed at comprehensive, in depth and incisive study of a product, process or service or all taken together in respect of a subject under standardization, encompassing literature review, analysis of the data from secondary sources, collection and analysis of data from primary sources and stakeholder consultations.

3.2 The duration of a project shall not exceed six months counted from the date of release of the first instalment of the funds to acceptance of the final report by the Sectional Committee concerned, provided that the Sectional Committee must not take more than one month to give its decision on the final report. Further provided that the time taken by the Sectional Committee for giving its decision shall not be counted. The Sectional Committee may extend the duration but for not more than 2 months in special circumstances, the reasons for which shall be recorded in the minutes of meeting of the Sectional Committee.

3.3 The upper limit for expenditure for a project shall be Rs 10 lakhs (including taxes) only.

3.4 BIS will publish a list of research & development projects along with Terms of Reference (ToR) on Standardization portal or any other suitable digital platform.

3.5 If any organization or an expert on behalf of an institute wants to propose a research & development project on any new and emerging area in which they have expertise, they can do so through the same platform for the consideration of the Sectional Committee.

4 TERMS OF REFERENCE (ToR)

4.1 The ToR of Research& development project shall be prepared by the Sectional Committee concerned, and shall contain:

- a) Title, background and objectives of the study;
- b) Expected research methodology (brief information, for example, survey, testing, industry visits, etc.);
- c) Scope of study;
- d) Outline of the tasks and final deliverables expected from the Proposers;
- e) Methods of review, schedule for submitting the 1st draft report and project completion report;
- f) Any support or inputs to be provided to the Proposer; and
- g) Maximum duration of project and timelines for submission of proposal.

4.2 While preparing the Terms of Reference (ToR) the sectional committee may consider the following points as a research & development project may include one or mix of the following:

- a) Secondary research based on internet or published information including authentic data sources;
- b) Survey based research (including industry visits) to ascertain prevailing market conditions and practices, standards in use, industry and consumer preferences, availability of infrastructure, technical capabilities, comparative trends, economic trends;
- c) Ascertaining compliance to existing and proposed standards through testing, review of past test reports, other validation and verification checks; and
- d) Basic and innovative research to establish normative criteria. Criteria may include performance, health, safety, environmental impact.

5 APPROVAL OF COMISSIONING OF THE RESEARCH AND DEVELOPMENT PROJECTS

5.1 There shall be a Review Committee for approving the projects recommended by the Sectional Committee. The composition of Review Committee shall be as follows:

DDG (SCMD)	: Chairperson
DDG (Standardization) concerned	: Member
DDG (Certification)	: Member
DDG (Labs)	: Member
Officer in-charge for research works in SCMD	: Member Secretary

5.2 The Head of Technical Department concerned and Member Secretary of the Sectional Committee shall apprise the review committee about the project and explain the rationale behind the proposed research & development project.

6 ELIGIBILITY CRITERIA

6.1 The following shall be eligible for carrying out research & development projects under the Scheme:

- a) Academic institutions & universities having MoU with BIS and faculties and research scholars thereof;
- b) Member(s) of Technical Committees of BIS.
- c) Government research laboratories of repute like CSIR, DRDO, ICAR etc.

6.2 Faculties and research scholars shall submit proposals through their institute. Members of technical committees belonging to any association/organization shall submit the proposals through their association/organization. Members of technical committees in personal capacity can submit their proposals directly to BIS, however if carrying out a research & development

project requires collaboration with any institution/organization, concurrence of the same shall also be submitted.

7 PROCEDURE FOR APPLICATION

7.1 Submission of Proposal

7.1.1 Applications for undertaking research & development projects shall be submitted in the manner prescribed by the Bureau and within the prescribed timelines,

7.1.2 Proposer(s) shall submit their proposal in a “single stage - two envelope bid system” consisting of separately sealed “Technical and Financial proposals”. The Technical Proposal shall be submitted as per format prescribed in **Annex A** and the Financial Proposal shall be submitted in the format prescribed as per **Annex B**, clearly specifying expected expenditure against each element such as manpower, equipment (shall not include standalone desktops/laptops/printers etc), travelling, testing, consumables, stationery, overheads, etc.

7.2 The proposals shall inter-alia consist of the following:

7.2.1 In respect of the research & development projects put up by the Bureau:

- a) Details of the Project team along with the organization/institution associated with;
- b) The CV of the Project leader and expert/expert(s) to be associated with the project and a letter from organization authorizing Project Leader and expert/expert(s) to undertake the research as proposed.
- c) A write up on the understanding of the scope and objectives of the project.
- d) Methodology (sampling size, if applicable) to be adopted for the proposed study with a clear road map and time plan for completion of the project;
- e) Stage wise timelines for completion of the project.

7.2.2 In respect of research & development projects proposed by any expert/organization:

- a) Details of the Project team along with the organization/institution associated with;
- b) The CV of the Project leader and expert/expert(s) to be associated with the projects and a letter from organization authorizing Project Leader and expert/expert(s) to undertake the study as proposed.
- c) Objective that will be achieved and scope of the project clearly highlighting the need of such study and what would be the final deliverable;
- d) Methodology (sampling size if applicable) to be adopted for the proposed study with a clear road map and time plan for completion of the project;
- e) Details of infrastructure facilities available for the project, in the institution and additional facilities required (if any) for carrying out research.
- f) Stage wise timelines for the completion of the project

7.3 The Head of the concerned institution while forwarding the application and nominating the project leader shall certify that:

- a) the core facilities (land, buildings, laboratory, manpower and other infrastructure etc.) are available and will be provided to the Project Leader to work on the proposed project,
- b) the organization will discharge all its obligations, particularly in respect of management of the financial assistance given, and
- c) no other funding is being received/sought for the project proposed to be sanctioned by BIS.

8 PROCEDURE FOR APPROVAL WITHIN BIS

8.1 There shall be a Research Evaluation Committee (REC) to evaluate the proposals received, the composition of which shall be as follows:

DDG (PRT)	: Chairperson
Head (CMD) concerned	: Member
Head (LPPD)	: Member
Head of the Technical Department concerned	: Member
Director Finance	: Member
Two Experts from the Sectional Committee concerned	: Members
Head (SCMD)	: Member Secretary

*The experts shall be nominated by the Sectional Committee and the nominated members shall give a declaration to the effect that there is no conflict of interest with respect to the project.

8.2 The evaluation and selection will be as per Quality and Cost Based Selection (QCBS) method (Rule 192, GFR 2017) which is explained in **Annex C**.

8.3 The criteria for evaluation of technical proposal shall be as under:

Sl No.	Criteria	Max. Marks	Score by REC
1	Profile of key individual/individuals to be associated with the research project	10	
2	Experience of the individual/organisation in conducting research projects in the relevant discipline	20	
3	Understanding of Scope, Objectives and deliverables	15	
4	Methodology	30	
5	Work plan/Execution strategy	15	
6	Chapterisation, contents and lay out of the proposed report	10	
TOTAL		100	

Note: REC may call for a presentation by the proposers if deemed necessary.

8.4 The minimum qualifying marks shall be 70. All the proposals with marks below 70 shall be considered rejected.

8.5 REC may refer back, advise changes for reconsideration or reject any proposal.

8.6 REC shall open the financial proposals (bids) within 7 days from completion of technical evaluation.

8.7 A final score sheet of all the proposers shall be made as detailed in **Annex C** and the proposer getting the highest combined score shall be selected for awarding the project.

8.8 The member secretary (REC) shall send the selected proposals to DG/DDG Standardization concerned, as per their delegated powers, for consideration and approval for sanction of the project.

8.9 After the approval of project, the member secretary (REC) shall inform the concerned technical department and the proposer regarding the decision.

9 AWARD OF PROJECT

9.1 After the approval of project, the member secretary (REC) shall inform the concerned technical department and the proposer regarding the decision along with the format of the Consent Letter (Annex D) to be signed by the proposer.

9.2 After receipt of duly signed consent letter from the proposer, the first instalment of the total approved project cost shall be released. The project would be considered to have commenced from the date the first instalment is released.

9.3 In case the proposer to whom the project is awarded declines to take up the project, the Research project shall be awarded to the proposer getting the next highest combined score among the qualified proposers.

10 FUNDING

10.1 The mode of payment for Research & development projects shall be as follows:

- a) First instalment of 30 percent of the total approved project cost would be released after approval of the project.
- b) Second instalment to the extent of 50 percent of the approved estimated cost would be released on the submission of progress report along with the report on utilization of the 75 percent of the fund and acceptance of the same by the Sectional Committee.
- c) The balance amount shall be released after submission of the final project report along with utilization certificate for the fund released and its acceptance by the Sectional Committee.

10.2 Release of each instalment is subject to satisfactory progress, required stage - wise deliverables and submission of the Utilization Certificate (UC) as per Form GFR12-A of GFR 2017 along with the statement of expenditure (SoE) issued by the Competent Authority.

11 PROGRESS REPORT AND MONITORING OF PROJECT

11.1 The relevant Sectional Committees of BIS will monitor the progress of project to ensure that the project is progressing as per the planned arrangement. However, member secretary of the concerned Sectional Committee under overall coordination of HoD would be the controlling/link officer for Research & Development projects and would constantly monitor the progress of the project every 30-45 days. Any delay in implementation of project should be duly justified by the Project leader and shall be put up to the sectional committee for approval.

11.2 The Sectional Committee shall review and give its acceptance of the progress reports submitted, within 3 weeks.

12 SUBMISSION OF FINAL PROJECT REPORT (FPR)

12.1 The FPR must be detailed and should include information about:

- a) the original objective(s) of the project,
- b) how far these objective(s) have been achieved, and
- c) how the results will benefit the development of the national standard(s) and
- d) a copy of final working draft of the concerned standard(s) (wherever applicable)
- e) include clear inferences, recommendations regarding their use in the proposed standards,
- f) all references used, raw data of surveys, sampling, testing and experiments,
- g) undertaking that all the information presented is authentic.

12.2 FPR received in BIS would be put up to the concerned Sectional Committee, which will take necessary action for preparation/revision of standard appropriately. The Project leader shall assist in the disposal of comments received on the research project, draft standard and for the preparation of the finalized draft, as may be desired by the Sectional Committee.

12.3 The proposer shall submit the Project Completion Report (PCR), within one month of completion of project along with the Utilization Certificate of the fund released as per Form GFR 12-A of GFR 2017 and the statement of expenditure (issued by the Competent Authority -in case of Govt. organization / Chartered Accountant in case of private organization).

13 RESULTS OF RESEARCH & DEVELOPMENT

13.1 Project Leader(s) would be encouraged to publish the results of research & development. While doing so, acknowledgement to the effect that financial assistance was received from BIS

should be made in the research paper(s) published. BIS should be acknowledged in similar type of other published work/press reports.

13.2 One re-print of each research paper(s) published as a result of the work done under the BIS funds shall be sent to BIS as and when published.

14 INTELLECTUAL PROPERTY RIGHTS

14.1 Ownership of any intellectual property, including but not limited to confidential information, know-how, patents, copyrights, design rights, rights relating to computer software, and any other industrial or intellectual property rights, developed solely by Proposer shall be vested with that Party.

14.2 Ownership of any intellectual property, including but not limited to confidential information, know-how, patents, copyrights, design rights, rights relating to computer software, and any other industrial or intellectual property rights, developed solely by the Bureau shall be vested with that Party.

14.3 The Intellectual Property arising out as an outcome of research project undertaken under these guidelines shall be vested with Bureau.

14.4 The proposer shall indemnify BIS from any legal and/or financial encumbrance arising out of any infringement of IPR/licensing of IPR/technology transfer/commercialization.

15 OPERATION OF FUNDS

15.1 The utilization certificate of the funds received in previous instalment (if any) to BIS should be annexed with the Statement of all equipment, books, etc purchased out of the funds certified by the Head of the organization. The name, description of the equipment, cost in rupees, date of purchase, and the name of the supplier to be given in the list. The main purpose/function of the equipment may also be mentioned against each item.

15.2 Any unspent balance lying with the organization should be refunded to BIS after the finalization of the draft immediately, by means of demand draft or online transfer.

15.3 The Head of the concerned standardization department of BIS shall ensure that the project leader submits the utilization certificate in the manner prescribed in Form GFR 12-A of GFR 2017.

15.4 Head of the Standardization department shall also ensure that the operation of funds is monitored strictly as specified in **Annex E**. Further the Project Leader is also fully aware and shall adhere to the obligations of his/her as given in this procedure.

16 OTHER REQUIREMENTS

16.1 Organizations receiving financial assistance for research & development projects from BIS would have to maintain separate accounts for each research project.

16.2 In the event of a Project Leader's absence from his normal place of duty for two months at a stretch, the Head of the organization would need to immediately nominate an Alternate Project Leader(s) to supervise the implementation of the project and such a name has to be approved in advance by BIS. In any event, a Project Leader shall give prior notice to BIS of his intention to stay away from the project.

16.3 Items of equipment, etc should be purchased on the basis of the established rules and procedures of the entity/organization.

16.4 Stock register of all equipment, books, etc purchased out of the funds shall be maintained.

16.5 Any capital-intensive equipment/devices purchased using financial assistance from BIS for research & development projects shall be allowed to be retained by the proposer for their research activity etc.

16.6 The organization shall have to ensure that expenditure with respect to TA/DA are made only as per their own norms but under no circumstances the executive/business class air travel or stay in a five-star hotel is made. The overhead expenses should not be more than 20 percent of the cost of the project.

16.7 The Project Leader must ensure that the concerned organization's newsletter would carry information on the activities and accomplishments of the various projects funded by the BIS.

17 TERMINATION OF PROJECT

The research & development project can be terminated in case of any of the following:

- a) the approval of research & development project may be treated as withdrawn, if the sanctioned research & development project does not commence within one month from the date of receipt of the sanction letter, unless otherwise authorized by BIS;
- b) A Proposer may request for the withdrawal of a research & development project even after commencement of the project. In such case the entire fund given till that date shall be refunded to the Bureau; and
- c) if the Proposer fails to submit Progress report/Final Project report within the prescribed timelines.

The REC shall take decision on all cases of termination.

18 RESOLUTION OF DISPUTES

Dispute Resolution: In case of any dispute that cannot be resolved amicably, it shall be referred to Sole Arbitrator appointed by the Director General of the Bureau of Indian standards, whose decision shall be final and binding upon both the parties. The provisions of the Arbitration and Conciliation Act, 1996, as amended from time to time, shall be applicable.

ANNEX A

TECHNICAL PROPOSAL

1. Name of the Proposer and Organization	
2. Project title	

3. Project leader

a) Title: Prof/Dr/Mr/Ms	Sex
b) Name:	M/F
c) Full official address	
Mobile/Telephone Fax E-mail	
d) Designation	
e) Date of birth	
f) Academic qualifications along with year of completion	
g) Experience	

4. Other members of the research team (give name, address, experience and academic qualifications for each member)

1. Name	Designation: Address: Experience: Academic Qualifications:
1. Name	Designation: Address: Experience: Academic Qualifications:

5. Research support availed/being availed/applied for by the Project leader from different sources, including BIS, during the last 5 years:

Funding agency	Title of the project and reference number	Duration (from mm/yyyy to mm/yyyy)	Percentage of time devoted /being devoted/to be devoted, in man months	Amount in lakh Rs.

6. Details of facilities available with the institute/organization w.r.t. the research & development project

Facilities	Relevance to project
1.	

7. Aims and significance of the project

(Include the current status of work in area, both in India and abroad, with appropriate reference list at the end; identify lacunae, define question to be investigated; list briefly specific objectives of investigation. ethical clearance be enclosed where necessary).

8. The CV of the Project leader and expert/expert(s) to be associated with the projects and a letter from organization authorizing Project leader and expert/expert(s) to undertake the study as proposed.

9. Objective that will be achieved and scope of the project clearly highlighting the need of such study and what would be the final deliverable.

10. Methodology (sampling size if applicable) to be adopted for the proposed study.

11. Road map (Stage wise timelines for the completion of the project) and time table for completion of the project

12. Plan of work, methods and techniques to be used.

13. List of awards and honours conferred on the Project leader with dates.

14. Deliverables

15. Declaration and attestation:

I certify that all the details declared here are correct and complete.	Date:
Signature of Project leader	

12. Certificate of the institution:

This is to certify that	
a) we have read the terms and conditions of the BIS Research & Development Guidelines necessary for the compliance of the same.	
b) the necessary institutional facilities are available and will be provided for the implementation of this research proposal being submitted to the BIS for funding.	
c) Full account of expenditure will be rendered by the institution.	
Name of the head: of the institution	
Signature with date:	
Seal:	

ANNEX B
FINANCIAL PROPOSAL FORMAT
[To be submitted on letterhead wherever applicable]

To:
Bureau of Indian Standards
Manak Bhavan, 9 Bahadur Shah Zafar Marg
New Delhi – 110002, India

Sub: Financial Proposal for Research & development Project on (Title: _____)
for Bureau of Indian Standards (Research guidelines document no. _____ dated: ____-____-____).

Dear Sir,

We are pleased to submit our Financial Proposal for Research & Development Project on (Title: _____) for Bureau of Indian Standards as per the terms and conditions of the Research & Development guidelines document (Ref No.: _____ dated: ____-____-____).

1. We hereby declare that our financial proposal is unconditional in all respects.
2. Our financial proposal is as follows:

3. Cost of the Project:

Sl no.	Budget items	Amount
1	Manpower cost	
2	Consumables [Chemicals, samples, testing glassware, stationery, books etc, information search (from databases)]	
3	Equipment	
4	Travel	
5	Any other/Overhead expenses	
	Total project cost	

*Please write NA in case any item is not applicable

- a) The prices should be quoted in Indian Rupees above by the proposer.
- b) The quoted price should be inclusive of all applicable taxes and charges.
- c) Fund shall be released after deducting TDS as per applicable provisions of GST and income tax.
- d) Justification of cost (for each item of equipment, consumables and travel. Quotation(s) for equipment should also be enclosed).

Date:

Place:

Name and Signature of the head of the institution

(Rubber seal of the proposer/institution/organization, as applicable)

Yours faithfully,

(Signature of the Project leader)

(Name and Designation of the proposer)

ANNEX C

Stage 1: Evaluation of Technical Proposal:

- a) The proposal will be evaluated against the criteria defined at clause **8.3** in these Guidelines. The proposer may be required to provide additional details as deemed necessary by the REC.
- b) Upon technical evaluation of each proposal, “Technical marks” out of 100 marks will be assigned to every proposal.
- c) The proposals with score 70 or more marks in technical evaluation, will qualify for the evaluation of the financial proposal.
- d) The proposer with the highest marks in technical proposal will be awarded 100 “Technical Score” and subsequently other proposers will also be awarded “Technical Score” relative to the highest technical marks for the final composite score calculation purpose e.g., if the highest technical marks is 90 then “Technical Score” is $(90/90) \times 100 = 100$, hence the proposer with highest technical marks will score 100 “Technical Score”. Similarly, another proposer who scored 80 marks, will get $(80/90) \times 100 = 88.88$ “Technical Score”. Following formula will be used for the “Technical Score” (TS) calculation:

$$\text{Technical Score (TS)} = \left[\frac{\text{Proposer's Technical Marks}}{\text{Highest Technical Marks}} \right] \times 100$$

Stage-2 Evaluation of Financial Proposal

- a) The evaluation will be carried out if financial proposals are complete and computationally correct.
- b) Upon financial evaluation of each proposal, the lowest financial proposal will be awarded 100 “Financial score”. The “Financial Score” of other proposer(s) will be computed by measuring the financial proposal against the lowest financial proposal. Following formula will be used for calculating “Financial Score”:

$$\text{Financial Score (FS)} = \left[\frac{\text{Lowest Financial proposal}}{\text{Proposer's Financial Proposal}} \right] \times 100$$

Stage-3 Computation of Combined Score

The “Combines Score” is a weighted average of the Technical and Financial Scores. The ratio of Technical and Financial Scores is 70:30 respectively. The Combined Score will be derived using the following formula:

$$\text{Combined Score} = [(\text{TS} \times 0.70) + (\text{FS} \times 0.30)]$$

The responsive proposers(s) will be ranked in descending order according to the Combined Score, which is calculated based on the above formula. The highest-ranking proposer as per the Combined Score will be selected for award of Research Project.

ANNEX D

CONSENT LETTER

This has reference to award of the following R&D Project in favour of the undersigned.

Project Code	Project Title	Proposer	Financial Proposal (in lakh Rs)

I/We hereby give consent to the execution of the above project, which shall be governed by the following:

- i) Terms of Reference (ToR) of the project mentioned above;
- ii) Guidelines for R&D Projects (SCMD/R&D Guidelines/20240522);
- iii) Proposal submitted by us.

I/we understand that the first instalment (30 percent of the approved financial proposal) shall be released after submission of this consent by us. The amount may please be transferred to the following account:

- a) Name of the Account Holder
- b) Account No.
- c) IFS Code
- d) Name & branch of the Bank.

Thanking you,

To be signed by
(Proposer/Project Leader)

Name and Signature of the head of the institution
(Rubber seal of the proposer/institution/organization, as applicable)

ANNEX E

OPERATION OF FUNDS AND PROGRESS REPORT

1. Title of the Project:	Project number:
2. Name & Address of Project leader:	Date of Commencement: dd/mm/yyyy

3. Details of Equipment Purchased (if any):

Name of equipment	Cost	Supplier	Date of purchase/ placing order for each item of equipment

NOTE - The equipment fund once fixed cannot be enhanced. Project leaders are advised to give authenticated estimates of the cost of equipment. Equipment should invariably be purchased within 1 month from the date of receipt of the fund and/or sanction letter.

4. Fund received_____.

5. Expenditure made in Rupees: (Please provide the details)

Expenditure	Amount	Taxes (as applicable)	Total
Manpower cost			
Consumables			
Equipment			
Travel			
Others			
Grand Total			

6. Amount saved (if any) from the last instalment: Rs_____.

7. Date on which scheme will complete its normal tenure of months _____.

8. Whether extension beyond normal tenure has been requested. Yes /No.

If yes, justification for extension and programme of work to be completed. Also mention as to why the work could not be completed as per the original plan.

{Extension beyond normal tenure should be requested at the Project Monitoring Session before end of tenure (as given in ToR)}.

9. Constraints (if any) faced in the progress of work and suggestions to overcome them.

10. Any deviation from original plan with its nature and cause.

11. List of publication giving full bibliographic details accrued from this project (copies of the paper (s) should be enclosed).
12. Summary of work done (200 words).
13. Proposed programme of work for the next month (1000 words).
14. Detailed Progress Report enlisting the objectives in beginning briefly (up to five pages maximum).

Signature of Project leader
Date:

Note: No column should be left blank; write not applicable (NA), wherever applicable.