

F.No.2/2/2020-NTTM

Government of India

Ministry of Textiles

Udyog Bhawan, New Delhi

Dated : 18th January 2021

OFFICE MEMORANDUM

Subject :- Invitation of Research Proposal under National Technical Textiles Mission - reg.

Research proposals are invited from organisations under the control of Ministries/ Departments of the Government of India or Academic Institutions of repute, engaged in advanced research in subjects related to research topics identified as enclosed at Annexure-I.

2. Guidelines on the subject is enclosed herewith in Annexure-II explains the eligibility, methodology as well as format for applications.

3. Organisations, having adequate infrastructure and capacity (in research topics as indicated in Annexure-I) are requested to submit their applications to the undersigned in the e-mail id: tammt@nic.in by 2.2.2021. The applications may be signed in all pages as well at appropriate page by the authorised officials and scanned copies may be sent from officials ID of the organisations/ institution.

4. This issues with the approval of competent authority.



(G.K. Rajnish)

Under Secretary to the Govt. of India

Tel: 23063837 / E-mail: gk.rajnish@nic.in , tammt@nic.in

To,

- (i) Office of Principal Scientific Advisor, Prithivi Bhawan, New Delhi with a request to circulate widely and upload on their website. vijayraghavan@gov.in, sureshkk@gov.in
- (ii) Secretary, Department of Science & Technology, New Delhi dstsec@nic.in
- (iii) Secretary, Department of Bio Technology, New Delhi. secy@dbt.nic.in
- (iv) Secretary, Department of Agricultural Research & Education, and Director General ICAR, New Delhi dg.icar@nic.in
- (v) Secretary, Department of Defence Research, and Chairman DRDO, New Delhi secydrdo@hqr.drdo.in
- (vi) Secretary, Department of Space, Bangalore chairman@isro.gov.in
- (vii) Secretary, Department of Atomic Energy, Bangalore. chairman@dac.gov.in
- (viii) Director General, CSIR, New Delhi dg@csir.res.in, dgcsir@csir.res.in
- (ix) Director, Indian Institute of Sciences, Bangalore, office.director@iisc.ac.in

(x) Indian Institute of Science Education & Research (7)

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2	Mohali	Prof J Gowrishankar	director@iisermohali.ac.in
3	Tirupati	Prof. K.N. Ganesh	director@iisertirupati.ac.in
4	Berhampur	Prof. K.V.R. Chary	director@iiserbpr.ac.in
5	Kolkata	Prof. Saurav Pal	director@iiserkol.ac.in
6	Pune	Prof. Jayant B Udgaonkar	jayant@iiserpune.ac.in
7	Bhopal	Prof. Siva Umapathy	mayank@iiserb.ac.in directoroffice@iiserb.ac.in

(xi) The Director, National Institute of Science Education & Research, Jatni, Odisha. director@niser.ac.in

(xii) The Heads of Indian Institute of Technology (23)

S.No.	IIT Names	Directors' Name	Email
1.	IIT Kharagpur	Prof. Virendra Kumar Tewari	director@iitkgp.ac.in
2.	IIT Bombay	Prof. Subhasis Chaudhuri	director@iitb.ac.in
3.	IIT Madras	Prof. Bhaskar Ramamurthi	director@iitm.ac.in
4.	IIT Kanpur	Prof. Abhay Karandikar	director@iitk.ac.in
5.	IIT Delhi	Prof. V. Ramgopal Rao	director@admin.iitd.ac.in
6.	IIT Guwahati	Prof. Dr. T. G. Sitharam	director@iitg.ac.in
7.	IIT Roorkee	Prof. Ajit K. Chaturvedi	director@iitr.ac.in
8.	IIT Bhubaneswar	Prof. R. V. Rajakumar	director@iitbbs.ac.in
9.	IIT Hyderabad	Prof. B S Murty	director@iith.ac.in
10.	IIT Patna	Prof. Pushpak Bhattacharyya	director@iitp.ac.in
11.	IIT Gandhinagar	Sudhir K Jain	director@iitgn.ac.in
12.	IIT Jodhpur	Prof. Santanu Chaudhury	director@iitj.ac.in
13.	IIT Ropar	Prof. Sarit Kumar Das	skdas@iitrpr.ac.in
14.	IIT Indore	Prof. Neelesh Kumar Jain	director@iiti.ac.in
15.	IIT Mandi	Prof. Ajit Kumar Chaturvedi	director@iitmandi.ac.in
16.	IIT (BHU) Varanasi	Prof. Pramod Kumar Jain	director@iitbhu.ac.in
17.	IIT Palakkad	Prof. P.B. Sunilkumar	director@iitpkd.ac.in
18.	IIT Tirupati	Prof. K. N. Satyanarayana	director@iittp.ac.in
19.	IIT (ISM) Dhanbad	Prof. Rajiv Shekhar	director@iitism.ac.in

S.No.	IIT Names	Directors' Name	Email
20.	IIT Bhilai	Professor Rajat Moona	director@iitbhilai.ac.in
21.	IIT Goa	Prof. B. K. Mishra	director@iitgoa.ac.in
22.	IIT Jammu	Prof. Manoj Singh Gaur	director@iitjammu.ac.in
23.	IIT Dharwad	Prof. P. Seshu	director@iitdh.ac.in

(xiii) The Heads of National Institute of Technology (31)

S No.	Name of the Institute	Name of Head of NIT	Email ID
1.	Malaviya National Institute of Technology Jaipur	Prof. Udaykumar R Yaragatti, Director	director@mnit.ac.in
2.	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Prof Lalit Kumar Awasthi Director	director@nitj.ac.in
3.	Maulana Azad National Institute of Technology Bhopal	Dr. Narendra Singh Raghuwanshi Director	nsr@manit.ac.in
4.	Motilal Nehru National Institute of Technology Allahabad	Prof. Rajeev Tripathi, Director	rt@mnnit.ac.in
5.	National Institute of Technology Agartala	Prof. H. K. Sharma Director	nita.director@gmail.com
6.	National Institute of Technology Calicut	Dr. P S Sathidevi Director	director@nitc.ac.in
7.	National Institute of Technology Delhi	Dr. Satish Kumar, Director	director@nitdelhi.ac.in
8.	National Institute of Technology Durgapur	Prof. Anupam Basu Director	director@admin.nitdgp.ac.in
9.	National Institute of Technology Goa	Prof.(Dr.) Gopal Mugeraya, Director	director@nitgoa.ac.in
10.	National Institute of Technology Hamirpur	Prof. Vinod Yadava, Director	director@nith.ac.in
11.	National Institute of Technology Karnataka, Surathkal	Prof. Karanam Umamaheshwar Rao, Director	director@nitk.ac.in
12.	National Institute of Technology Meghalaya	Prof. Bibhuti Bhusan Biswal, Director	director@nitm.ac.in
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14.	National Institute of Technology Patna	Prof. Pradip Kumar Jain Director,	director@nitp.ac.in
15.	National Institute of Technology Puducherry	Dr. K. Sankaranarayananasamy, Director	director@nitpy.ac.in
16.	National Institute of Technology Raipur	Dr. Rawani, Director	director@nitrr.ac.in
17.	National Institute of Technology Sikkim	Prof. Mahesh Chandra Govil, Director	director@nitsikkim.ac.in, directoroffice@nitsikkim.ac.in

18.	National Institute of Technology Arunachal Pradesh	Prof. Pinakeswar Mahanta, Director	director@nitap.ac.in
19.	National Institute of Technology, Jamshedpur	Prof. Karunesh Kumar Shukla, Director	director@nitjsr.ac.in
20.	National Institute of Technology, Kurukshetra	Dr. Satish Kumar, Director	director@nitkk.ac.in
21.	National Institute of Technology, Manipur	Prof. (Dr.) Goutam Sutradhar	goutam_sutradhar1@rediffmail.com, director@nitmanipur.ac.in
22.	National Institute of Technology, Mizoram	Prof. Rajat Gupta, Director	director@nitmz.ac.in rguptanitsri@gmail.com
23.	National Institute of Technology, Rourkela	Prof. Animesh Biswas, Director	director[at]nitrkl.ac.in
24.	National Institute of Technology, Silchar	Professor Sivaji Bandyopadhyay, Director	director@nits.ac.in
25.	National Institute of Technology, Srinagar	Prof. (Dr.) Rakesh Sehgal, Director	director@nitsri.net
26.	National Institute of Technology, Tiruchirappalli	Dr. Mini Shaji Thomas, Director	director@nitt.edu
27.	National Institute of Technology, Uttarakhand	Prof. Shyam Lal Soni Director	director@nituk.ac.in
28.	National Institute of Technology, Warangal	Prof. N.V. Ramana Rao, Director, NIT Warangal	director@nitw.ac.in
29.	Sardar Vallabhbhai National Institute of Technology, Surat	Prof. S.R. Gandhi, Director	director@svnit.ac.in
30.	Visvesvaraya National Institute of Technology, Nagpur	Dr. Pramod M. Padole, Director	director@vnit.ac.in
31.	National Institute of Technology, Andhra Pradesh	Prof. C. S. P. Rao, Director	director@nitandhra.ac.in

Copy to: (i) NIC For uploading it on the home page of the website of the Ministry.
(ii) Joint Secretary, MoT & Mission Coordinator, NTTM for information

Identified Research Topics

1. High molecular weight/High strength polyethylene fibers

- 1 1. Composites of fibers thereof for focused applications
- 1.2. Development of armours
- 1 3 Development of parachute material
- 1 4 Solid state processed DPE tapes and gel spun ultra-high- molecular-weight polyethylene Fibers
- 1 5. Development of bullet proof material thereof -
- 1.6. Surface modifications thereof, application of Graphene, functional layers, etc. process optimization for production of such fibers. Graphene incorporated fibers are useful for antistatic and antimicrobial applications
- 1 7. Development and manufacture of nano-fabrics for respiratory masks etc,
- 1.8 Development of helmets
- 1.9 Precursor polymer development
- 1 10. Carbon fibres produced from Carbon nanotube (CNT) reinforced acrylic precursors.

2. Acrylic fibers

- 2.1 Development of improved process of polymerization- Polymers with narrow molecular weight distribution / poly dispersity index (PDI) for better fiber spinning and improved properties
- 2.2 Development of fibers from acrylonitrile.
- 2.3 Manufacture of standard modulus grade carbon fibre
- 2.4 Development of intermediate grade carbon fibre

3. Carbon fiber from coal tar /petroleum pitch

- 3.1 Coal tar pitch to green fibre
- 3.2 Petroleum pitch to green fibre
- 3.3 Conversion of green fibre to carbon fibre

4. Glass Fibers

- 4.1 Development of improved reinforced glass fiber products
- 4.2 Technology for making low-cost reinforced glass fibers by way of reducing thickness of layers
- 4.3 Glass fibers and hybrids for light-weighting of automobile
- 4.4 Thermal insulation of reinforced glass fiber by way of nano-surface medication
- 4.5 Surface modification of reinforced glass fibers, TEFLON coating, etc, for Radome and telecommunication systems

5. Surface modifications of Carbon Fiber

- 5.1 Functional fibers - low volume, high value fibers
- 5.2 Development of nanofibers
- 5.3 Application of grapheme
- 5.4 Nano material surface coating for thermal and other applications
- 5.5 Activated carbon fibers (for energy storage - battery electrodes, etc)
- 5.6 Activated nano fabrics for medical, hygiene and other applications
- 5.7 Camouflage fiber development for military use
- 5.8 UV protected fibers
- 5.9 Surface modifications for other medical applications

6. Scaling up of electro-spinning process for nano-fibers

7. Development and manufacture of specific hybrid fibers, including Carbon-Glass fibers

8. Development and manufacture of Aramid Fiber.



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National Technical Textiles Mission

**General Guidelines for submission of Research Proposals under
Component-I (Research, Innovation and Development) and Terms of
Funding**


National Technical Textiles Mission is valid for the period 2020-21 to 2023-24, after which it will move into the sunset phase. All research objectives approved for National Technical Textiles Mission have defined target years which are 2021-22 for fundamental research at fibre level and 2022-23 for application and product developments. The Research Proposals must be submitted keeping in mind the target years of the Mission, so that the Desired Outcome of each research activity is available within the target year.

A: Mechanism for submission of Research Proposals from Research Bodies

A-1. A '**Research Body**' under National Technical Textiles Mission is Research Organisation, which is directly under the control of a Ministry/ Department of the Government of India, or an academic Institution of repute engaged in advanced research in the relevant field.

The Research Body may undertake the approved research activity entirely on its own, or involve partners from Industry or other research bodies. In case of an '**Industry Partner**' or multiple Industry Partners, the Industry Partner must have its manufacturing facility in India for a related product and must have adequate research infrastructure in India for undertaking research in the related field. The Research Body may also partner with other '**Laboratory Partner(s)**' who also must have adequate research infrastructure in the related field in India. The details of Industry/ Laboratory Partners have to be brought out in the research proposal with details of their specific roles in the Research Proposal. All Industry/Laboratory Partners must be registered in India

under the relevant legal provisions.


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Funding will be provided to the Research Body only, and the Research Body conducting the particular research project is primarily responsible for all inter-partnership coordination, distribution of funds, monitoring of expenditure and reporting progress to the Government. The Research Body is also responsible for the final Desired Outcome in the time bound manner.

A-4. The funding provided under National Technical Textiles Mission (Component-I) will not cover any cost towards additional infrastructure such as building or any renovation work. The research activities have to be undertaken within the available infrastructure arrangement of each participating organisation. However, research equipments which are additionally required for specific jobs not available earlier may be procured by the 'Research Body' the details of which needs to be clearly indicated in the Research Proposal submitted for consideration of the Government. As far as possible, common test facilities may be utilized where testing of such nature are not frequently necessary, so as not to create redundancy in testing infrastructure.

Ministry of Textiles is contemplating to create an integrated Testing & Certification Centre for Advanced Technical Textiles in association with the Government of Telangana. The facilities set up in this Centre may be utilized for advanced testing.

A-5. Cost incurred towards permanent manpower should not be charged to the cost of research. However, cost of additional temporary manpower (contract employee, consultants) proposed to be engaged for the '**Research Project**' may be indicated clearly in the research Proposal, with details of man-days and cost per man-day in respect of each such engagement.

A-6. Each Project will have maximum three **Stages** (including the final outcome stage), towards achievement of its '**Desired Outcome**'. The Desired Outcome must be in clearly identifiable terms, which has a potential for commercial use or towards an application of substantial improvement.



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The Research Proposal must indicate all such serial and parallel activities; and also indicate activities to be performed by the 'Research Body' and its Industry Partner/Laboratory Partner in colour code in the PERT diagram. The timeline for each activity leading to a milestone and the Stage (a Stage means achievement of a measurable and definable outcome prior to the Desired Outcome) also needs to be defined in the Research Proposal. Each Project will be reviewed periodically not exceeding once every six months to monitor progress, vis-a-vis its defined milestones and Stages. Further funding will depend upon satisfactory progress of the Research Project in terms of the approved plan.

A-7. The Research Proposals will be approved as per the Institutional Mechanism under National Technical Textiles Mission, notified in the Gazette of India vide Gazette Resolution Dated 17th March 2020. The Research Body submitting the Research Proposal and its Partners may be required to present the proposal before the Committee (s) at the time of its consideration.

A-8 National Technical Textiles Mission aims at research in niche areas of technology for boosting indigenous manufacturing and exports of value added and cutting edge technical textiles materials and products. All research projects have to be original in nature addressing a niche and advanced area of Technical Textiles having wider benefit to the country. The Research Body and its Partners for the Research Project are responsible for the protection of research confidentiality.

B: Funding Arrangement

- (i) 20% release of funds after approval of the Research Proposal and awarding of the Research Project and signing of Agreement/ MoU;
- (ii) 30% release of funds after Stage-I achievement of the Research Project and approval thereof, and utilization of minimum 70% of 1st installment;
- (iii) 30% release of funds after Stage-II achievement and approval thereof and utilization of 100% funds of 1st installment and minimum 70 % funds of

2nd installment;

- (iv) 20% final release of funds after achievement of the Desired Outcome and utilization of 100% funds of 1st, 2nd & 3rd installment released:

The scheme shall be implemented through a 3-tier institutional mechanism viz:-

- (i) Mission Steering Group
- (ii) Empowered Programme Committee
- (iii) Committee on Technical Textiles on Research, Development & Innovation

All the research equipments, additional contract manpower / consultants, procurement of research materials shall be purchased / hired keeping in view the relevant instructions of GFR 2017 and guidelines issued by the NITI Aayog and procure the equipments in order to promote ' Make In India ' and enable competitiveness of the industry by way of reduced capital costs .

The Mission will have a sunset clause after completion of its target year i.e 2023-24.

C: Intellectual Property

The Intellectual Property (IP) of the research outcome will generally vest with the Government. In cases, where a participating Industry Partner has contributed substantially, the concerned Industry Partner will have right over the IPs for a certain period. The policy regarding Intellectual Property rights out of the research outcomes will be as follows:

- (i) *Situation-1: A technology purely developed by an academic institution/ public funded laboratory.*

The IP will be licensed as per the institutional IP policy of the concerned academic institution/public funded institution or in the absence of such institutional IP Policy, will be governed by the National Government IP policy.

To the extent possible, IP may be open for licensing to any interested party or

non-exclusive basis.



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(ii) *Situation 2: An IP generated by an academic institution/ public funded laboratory is further scaled up through pilot/ validation project jointly with an industry partner resulting in new joint IPs.*

The partnering Industry may enjoy 'the right of first refusal' on the IP component of the joint IPs, residing with academic institution/ public funded laboratory and can be exclusively licensed to the Industry partner for a period of one year from the date of completion of the pilot scale/validation project. Beyond that period, the IP in question will be available to open to any industrial partner for licensing on a non-exclusive basis.

(ii) *Situation 3: An IP purely owned by an industry, based on which academic an academic institution/public funded institution is involved a joint project with the said industry for scale up.*

In this situation, any new IP generated by the academic institution may be licensed for a period of two years to the industry partner on an exclusive basis, from the date of completion of the pilot scale/validation project. Beyond two years, after duly assessing the milestone achievements and royalty realization, the IP can either be considered for further renewal with the same industry on mutually agreeable terms or made open to any interested party as per the terms of the relevant IP policy.

D: Format of Application

1. (i) Name of the Research Body with location and other details
- (ii) Administrative Ministry/ Department of GoI:
- (iii) Head of Research Project with :-
 - (a) Name:
 - (b) Designation:
 - (c) E-mail ID:
 - (d) Contact Number (Mobile No. Preferred):-



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(*The Head of the Research Project should not be below Scientist 'F' under

GoI or HoD of Academic Institute)

2. Details of Industry Partner(s) and Laboratory Partner(s)

A. Industry Partner/Laboratory Partner

- (i) Name of the Industry Partner/Laboratory Partner
- (ii) Address, Location,
- (iii) Registration details
- (iv) Current Manufacturing activities and/or Research infrastructure
- (v) Name/ Designation of the Lead Person

(Add more Industry/Laboratory Partners as B, C, D, etc)

3. Name of the Research Project

4. Objective of the Research Proposal and Abstract (note more than 500 words)

5. (A) Project Methodology

(B) Project Implementation Plan with milestones and Stages

(C) Role of each Partner

(D) Desired Outcome

6. Details of Costing: Includes additional research equipment, additional contract manpower/ consultants, procurement of research materials.

7. Details of available Research and Test Equipment required in connection with the Project (in respect of Research Body, each Partner)

8. PERT / Progress Chart (colour coded to indicate role of individual partners in case of partnership with Industry and other Laboratory) with Stages and Outcomes.

9. How the final outcome will benefit the society / economy as a whole (in quantifiable terms as much as possible).


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