

C-MET, HEADQUARTERS

Work Allocation

Sl. No.	Name & Designation	Work allocation of staff
1.	Shri. Magesh Ethirajan, Director General (A)	Head of the C-MET
2.	Smt. Radha Jaisimha Registrar	Head of the Administration
Staff under Registrar		
a)	Shri V.N. Shete, OA-II	1. Recruitment of Group A & B posts of three labs. 2. Parliament Question 3. Operating roster of Group A & B of three labs and Group C Pune lab. 4. Correspondence with MeitY, New Delhi 5. Settlement of C-MET , Delhi Imprest/bills
b)	Smt. A.C. Belhe, OA-II	1. PA to DG / Handling Imprest /Hospitality 2. DPC-Group-A Technical staff 3. Grievance 4. Court /CAT matter 5. Staff Representation matter
c)	Smt. A.P. Padalikar, OA-II	1. DPC-Below Group-A Technical staff 2. RTI- Maintenance of RTI Register, Correspondence/ disposal of RTI /Appeal Application/ RTI Quarterly reports 3. Reports – Sexual Harassments, Hindi language 4. Correspondence/Reminder to MeitY on Policy matters/on various subs. /Steno's work. 5. Training matter / Put up personal claims 6. Assistance to PC for Hindi Annual Report of C-MET.
d)	Contractual Staff	APAR maintenance, filing system/Record/Documents maintenance, day-to-day checking mails received from Labs. Maintenance of Stamp/Inward Register.
e)	Shri Y.S. Madke, SA-II	Dispatch, Xeroxing, file moving etc. misc. work

Sl. No.	Name & Designation	Work allocation of staff
3	Dr. R. Prasada Rao Programme Coordinator	<ul style="list-style-type: none"> • Managing and monitoring the activities of the technical groups under the Programme so as to ensure that various technical and financial targets are met. • Arrange periodic reviews by the Steering Committee (SC) and ensure submission of the outcome report to the Director General. Work out plans to expedite the pending/delayed issues and report to Director General. • Carry out necessary studies on market demand and technology status of the ongoing research programmes to keep abreast with the latest developments. • Carry out a study of the competing technologies and prepare a detailed comparison report, along with suggestions. This may be done routinely every 6 months, but at any time, in case of major development. • Providing inputs to the 'Steering Committee' with regard to latest development relevant/significant to the Programme on a regular basis. • Prepare Annual Reports, Annual Plans, Annual Budget and Outcome Budget for the Programme for each fiscal year and submit to Director General for consideration. This plan should include details required for the completion of activities of the Programme for the ensuing year and also to place necessary reports in the house of Parliament. • Reviewing all technical projects at the laboratories on quarterly basis and preparing & sending Monthly & Quarterly Progress Reports to the parent Ministry through Director General. • Identifying the end users for ToT of the successfully developed technologies and expanding the ToT activity by liasioning with the concerned C-MET laboratory and end user. • Working out strategies for self sustenance of C-MET and reviewing & upgrading every year to reach the goal. • Reviewing of Technologies transferred at end user premises for ensuring its usefulness for the country • Vetting of all technical projects, patents, costing and technical contents of MoUs with various organizations as per C-MET Policy. • Maintenance of project proposal records (both soft and hard) of submitted, ongoing, completed, ToT, Royalty, MoUs, etc. in the Office of Programme Coordinator for ready reference. • Design and development of publicity materials/campaigns etc. for marketing of C-MET knowledgebase. <p>Development of projects, establishment of laboratories and training of manpower.</p>

Distribution of work -Accounts & Finance section

Sl. No.	Name & Designation	Work allocation of staff
4	Shri. Pritam Saha Senior Finance Officer & Finance Officer (A)	<ul style="list-style-type: none"> • Monitoring of regular accounting & finance functions –finalization of accounts • Coordination with auditors (Statutory/Internal/CAG etc.) • Checking & monitoring Payroll & MIS reports • Checking & approving all payments (Employees/ Project Staff /Vendors etc.) & receipts – (DDO functions) • Taxation & Statutory matters – Income Tax/GST/TDS/ Profession Tax/PF/NPS • PFMS (Checker) • GEM (DDO functions) • Fund Management & Liaison with banks • Checking Project proposals / Project commencements/ Projects closures (Financial aspects)/Utilization Certificates etc.
Staff under SFO		
a)	Shri B.A. Ghanekar OA-I	<ul style="list-style-type: none"> • Monthly Reports to MeitY. • Clearing of party payment, Income Tax deduction of contractors. • Passing Bank Payment vouchers. • Salary, Income/Profession Tax, GIS. • Personal claims-Medical/Telephone/News paper Reimbursement. • TA and DA/Advances settlement • Interaction with Bank Authorities, L.I.C. of India. • Maintenance of C.P.F. Accounts. • PFMS entries (Maker).

C-MET, Pune Lab
Non-Technical Staff (Administration)

Sl No	Name / Designation	Work Allocated
01	Admin In Charge	Establishment & Administration: All personnel matters relating to recruitment and promotion, establishment matters such as maintenance of service books, personal files, leave records, personal claims, sanction advances, training, higher studies, travel/transport etc. Overall responsibilities of Purchase and Stores. Printing & Stationery, Security, Garden, House-Keeping matters and General Administration. Physical Verification of stores, Weeding out of old records, disposal of unserviceable/obsolete scrap materials. Any other duties assigned from time to time.
02	L.B.Gupta- Office Assistant-I	All establishment matters relating to staff of Pune. Maintenance of service books, Leave records, increment., All joining and resignation formalities. Sanction of advances, reimbursement of perks as per Staff Rules/Policy Manual. To deal with other personnel matters of the staff of Pune. Supply. permission for hire study, Recruitment of core & project Staff, promotion of S&T and non S&T staff, ACR/ Probation clearance. Monthly/quarterly reports. Training /Seminar etc. Matter of Ph. D. Any other duties as assigned from time to time.
03	Shri R.M. Damkale- Office Assistant-III	To deal with all matters related to Purchase from Processing of Indents (Import and Indigenous). Floating of enquiries (Single/Limited/Open Tender basis) up to issue Purchase Order. Preparing Customs clearance documents. Submission of monthly expenditure statement (Core/Sponsored/Technical Services project) and follow up of work. Payment of bills and Annual Maintenance Contract of Office/Laboratory Equipments. Maintenance of Indent Process Register, Purchase Order and E.M.D/Security Deposit Register. Any other duties as assigned from time to time.
04	Shri V.R.Kondhalkar- SA-III	To Asst. Sh. R.M. Damkale in Purchase matter To deal with all matters relating to Stores, Printing & Stationery. Assistance to A.O. for Disposal of obsolete/unserviceable scrap materials and weeding out of old records. Receipt and issue for consumable and non consumable items, Maintenance of Stock ledger, Physical Verification of stores, Payment of bills viz:-, Xerox, Security, House- keeping, etc Payment of Travel/Taxi, Telephone, Water/Property Tax, Payment of Garden, MSEB etc. . Any other duties as assigned from time to time.
05	Shri. C.N.Chavan SA-II	SSM will be exclusively used for Administration Office. Who will perform necessary duties including Inward Xeroxing, File Moving, Filing of Papers, Meeting arrangement Any other duties assigned from time to time and finance section

Distribution of work -Accounts & Finance section

Sl. No.	Name & Designation	Work allocation of staff
1	Mr.Pritam Saha, FO(A)	<ul style="list-style-type: none"> • Monitoring of regular accounting & finance functions –finalization of accounts • Coordination with auditors (Statutory/Internal/CAG etc.) • Checking & monitoring Payroll & MIS reports • Checking & approving all payments (Employees/ Project Staff /Vendors etc.) & receipts – (DDO functions) • Taxation & Statutory matters – Income Tax/GST/TDS/ Profession Tax/PF/NPS • PFMS (Checker) • GEM (DDO functions) • Fund Management & Liaison with banks • Checking Project proposals / Project commencements/ Projects closures (Financial aspects)/Utilization Certificates etc. Monitoring of regular accounting & finance functions –finalization of accounts • Coordination with auditors (Statutory/Internal/CAG etc.) • Checking & monitoring Payroll & MIS reports • Checking & approving all payments (Employees/ Project Staff /Vendors etc.) & receipts – (DDO functions) • Taxation & Statutory matters – Income Tax/GST/TDS/ Profession Tax/PF/NPS • PFMS (Checker) • GEM (DDO functions) • Fund Management & Liaison with banks • Checking Project proposals / Project commencements/ Projects closures (Financial aspects)/Utilization Certificates etc.
2	Mr. S. M. Parsankar, OA-III	<ul style="list-style-type: none"> • Processing of all payments – Core & Projects (Cheque /RTGS/ NEFT etc.) • CEA reimbursements & LTC settlements • Project Staff Salaries • Accounting for all kind of receipts / Digital transaction reporting • LC matters – Inland & Foreign • Day to day communication with banks • PFMS entries (maker) • Assisting in professional tax matters • Any other work as assigned by FO from time to time

3	Mr. Rahul Bagad, SA-III	<ul style="list-style-type: none">• Processing of all payments – Core & Projects (Cheque /RTGS/ NEFT etc.)• CEA reimbursements & LTC settlements• Project Staff Salaries• Accounting for all kind of receipts / Digital transaction reporting• LC matters – Inland & Foreign• Day to day communication with banks• PFMS entries (maker)• Assisting in professional tax matters• Any other work as assigned by FO from time to time
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**CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY
(C-MET), PUNE
WORK ALLOCATION TO EMPLOYEES
TECHNICAL STAFF**

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Materials for Renewable Energy & Sensors Dr. Sunit B. Rane	Dr. Sunit B. Rane Dr. Sudhir S Arbuj Dr. Govind G Umarji Dr. Manish D. Shinde Mrs. Shubhangi R. Damkale	1. Development of printable silver thick film ink for Radio Frequency Identification (RFID) Tags on environment friendly, flexible substrate for smart applications”, (PN/SP/073) <ul style="list-style-type: none"> • Synthesis of nano sized functional silver conducting material with different morphologies. • Synthesis of organic binder curable around 100 oC, compatible with the functional material facilitating better dispersion, rheology and adhesion. • To formulate printable nano silver conducting paste/ink composition compatible to flexible substrate. • To design and develop the prototype antenna tag test structures for ultra-high frequency (UHF) and Microwave range (869 MHz, 902-928 MHz and 2.45 GHz) RFID applications using in-house developed nano paste/ink on flexible substrate (paper or PET). Around 100 field trials with the industry partner
	Dr. Sunit B. Rane Dr. Manish D. Shinde	2. Studies on annealing on magnetic performance of NiFe laminations for Pulsed magnets used in Accelerators (PN/SP/081) <ul style="list-style-type: none"> • Optimization of processing conditions for Ni-Fe lamination & C- shape punched core sizes of 70 mm x 70 mm x 0.1 mm and 90 mm x 90 mm x 0.1 mm under hydrogen atmosphere. • Structural, magnetic and electrical studies on Ni-Fe lamination & C- shape punched core under annealed hydrogen atmosphere by varying process parameters such as annealing temperature, cooling rate and holding time. • Measurement of magnetic properties such as remanence, coercivity, peak permeability and core loss under different annealing conditions. • Microstructure –magnetic property correlation study in order to improve pulsed magnetic performance of soft magnet cores after cold work.

	<p>Dr. Sunit B Rane Dr. Manish Shinde Dr. Sudhir S Arbuji Dr. Govind Umarji Mrs. Shubhnagi R Damkale</p>	<p>3. Creation of R&D Culture in Electronic Materials among SC and ST Students in Maharashtra</p> <ul style="list-style-type: none"> • Development of research and technical attitude in students on electronics materials, their characterization and device fabrication through interactive lecture sessions at respective colleges and at C-MET, Pune. • Skill development program at C-MET Pune on materials synthesis / characterization equipments / processing and fabrication / water treatment / solar cells / electronic packaging / biomass utilization/Li-ion battery fabrication/ sensors by providing hands-on training. • Exposure to the students through scientific Workshop/ Training for in the area Electronic Materials Research.
	<p>Dr. Sunit B Rane Dr. Manish Shinde Dr. Sudhir S Arbuji Dr. Govind Umarji Mrs. Shubhnagi R Damkale</p>	<p>4. Materials for Renewable Energy and sensors applications.</p> <ul style="list-style-type: none"> • Synthesis of different semiconductor, MOFs materials for photocatalysis, hydrogen storage and hydrogen generation applications. • Development of materials for DSSC, hybrid and perovskite solar cells • Development of different materials and gas, VOC and NPK sensors
	<p>Dr. Sunit B. Rane Dr. Varsha Raut Dr. Manish D. Shinde Dr. Tanay Seth Dr. M. V. Kulkarni Dr. Govind G Umarji Dr. Sudhir S Arbuji</p>	<p>5. Centre of Excellence on Additive Manufacturing</p> <ul style="list-style-type: none"> • Additive Manufacturing Materials related to electronics products/ components (metal, ceramic, and semiconductor) • Basic R&D for Additive Manufacturing Materials related to electronics components (metal, ceramic, and semiconductor) (in collaboration with CIPET Bhuwaneshwar) • Development of materials and machine for AM technology for current and next generation electronic components/ products (in collaboration with Industries-(i) Intech Additive Solutions Pvt. Ltd. Bangalore and (ii) SPEL Pvt. Ltd. Pune)

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
<p>Nanocrystalline Materials/Nano composite Laboratory</p> <p>Dr. Milind V. Kulkarni Scientist 'E' & Group Head</p>	<p>Dr. Milind V. Kulkarni Group Head</p> <p>Dr. Ram Kalubarme, Dr. Jalinder D. Ambekar, Dr. Sonali D. Naik, Ms. Sonali A. Mahapure</p>	<p><u>PN/SP/064: Novel Nanostructured High Performance Anode Materials for High Energy Na-Ion Batteries</u></p> <ul style="list-style-type: none"> • Overall Planning and Execution of the Project as “Chief Investigator”. • Preparation and submission of progress report and arrangement of project review meetings and Presentation of Progress in PRSG Meetings. • Recruitment of staff and procurement of Capital equipments (Process and Characterization), Raw materials and consumables • Initial trials for the synthesis of Anode materials • Physico-chemical characterization of the anode materials • Fabrication of coin/button and pouch/rectangular type of Na –ion battery/cells and their Electrochemical characterization <p><u>PN/SP/068: Three Dimensional Nanostructure based Miniaturized and Flexible rechargeable lithium batteries for flexible electronics</u></p> <ul style="list-style-type: none"> • Overall Planning and Execution of the Project as “Chief Investigator”. • Preparation and submission of progress report and arrangement of project review meetings and • Presentation of Progress in PRSG Meetings. • Recruitment of staff and procurement of Capital equipments (Process and Characterization), Raw materials and consumables • Initial trials for development of flexible Cathode and anode • Physico-chemical characterization of the active materials • Fabrication of flexible Li –ion battery/cells and their Electrochemical characterization <p><u>PN/SP/075: Centre of Excellence on Rechargeable Battery Technology (pre cell)</u></p> <ul style="list-style-type: none"> • Overall Planning and Execution of the Project as “Co- Investigator”. • Preparation and submission of progress report and arrangement of project review meetings and Presentation of Progress in PRSG Meetings. • Recruitment of staff and procurement of Capital equipments (Process and Characterization), Raw materials and consumables • Development of Li –ion battery chemistry of Materials up to 500 gm batch scale. • Development of Na –ion battery chemistry of Materials up to 10, 100 & 500 gm batch scale. • Development of Solid State Polymer Li ion battery

Fabrication of full cells and optimization of materials with respect to enhanced capacity comparable commercial ones and ToT of the same.

- Collection of data of all materials for designing all kind of rechargeable prototype batteries.
- Design of equipments for material manufacturing at pilot level scale
- Design of equipment for manufacturing of fabrication of Li-ion cells at pilot level.
- Regeneration of cathode and anode from spent batteries.
- The CoE shall establish necessary infrastructure to enable R&D, Innovation (IPR), Product Development and Testing.

PN/TS/21-22/P01: Physico-chemical testing, modification / development and electrochemical evaluation of Graphite fines supplied by GIL for its usage as Anode in Li-ion batteries and making Anodes in Li-Ion batteries using the same

- Define the properties of the End Product i.e. of Graphite and of the Anodes as well as the range of these properties.
- Evaluation of Graphite Fines supplied by GIL for all Physical & Chemical properties as required by end product (Graphite and Anodes) of the study .
- Modification of Graphite fines provided by GIL for physical & chemical properties for achieving desired properties / values in end product.

Physico-chemical and electrochemical testing of the Pristine and Modified Graphite fines

- Evaluation of its usage as Anode in Li-ion batteries by making suitable cells. Development of Anodes using the graphite .
- Preparation of detailed performance / test report of developed materials for usage of GIL as reference for its target customers.
- Detailing of various steps / processes / equipment / inputs required for manufacturing of anode and graphite developed across the product range and setting the parameters of each type.
- Any other scope that may arise with mutual consent of both parties.

Arranging a lab visits

- Technical services Project:
- To Initiate the Technical services project with Industries/Startups/MSMEs
- Signing of MoU and NDA.
- Submission of Project proposal

Transfer of Technology:

- Cost Calculations, Preparation of ToT Documents and Expression of Interest Documents,
- Discussions with Interested Parties

		<p>Foreign as well as Indian Collaborations</p> <ul style="list-style-type: none"> • To establish the collaborations with Research Organization and Universities. • Exploratory Project Activities • To carry out Exploratory Research activities for the future sponsored projects, such as • Development of Materials for Energy Storage & generation Applications. • Development of Materials for Radiation Shielding Applications. • Development of E-Nose/Sensor for VOCs based early stage detection of diseases. • Flexible & Wearable Electronics: materials and devices. • Nanomaterials/ Polymer Nanocomposite based Sensor Materials & Devices <p>Administrative responsibilities</p> <ul style="list-style-type: none"> • Stores and purchase related to project. • Member of the various committees like LPC, Disposal Committee etc. Member/Chairman of the Screening / Selection/ Reviewing committee for the recruitment of project staff <p>Other</p> <ul style="list-style-type: none"> • Characterization Equipment related activities as Project manager/ In charge • Maintenance and operation of TG/DTA/DSC • Maintenance and operation of FE-SEM • Guiding PhD/M.Phil/MSc./M.Tech./BE Students <ul style="list-style-type: none"> • Organization of International/National conference • workshop
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Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Nanotechnology Group Dr. Tanay Seth	Dr. Tanay Seth Dr. (Mrs.) Varsha B. Raut	Center of Excellence on Additive Manufacturing <ul style="list-style-type: none"> ▪ Initiation and tendering of purchase of capital equipments/ materials through GeM portal; 1. Table top X-ray diffractometer 2. Induction Plasma System 3. Chemicals, gases, raw materials etc. ▪ Interaction with suppliers and users regarding procurement of capital equipments ▪ To procure and Install custom made Induction Plasma System for the synthesis of nano /micron sized (spheroidization) powders ▪ Trouble free operation, fault diagnosis and routine maintenance of Transferred Arc Thermal Plasma (TAPR) system for the synthesis of nano powders ▪ Maintenance of gas lines, water chiller and water level switches etc. ▪ Synthesis of metal/ metal oxide nanopowders by Transferred Arc Thermal Plasma for FFT printing ▪ Physico-chemical characterisation of synthesised nanopowders/ spheroidized powders ▪ To investigate and optimize the effect of reaction parameters such as plasma power, plasma composition, reactor pressure, quench gas flow rates on particle size and its distribution for various nano powders synthesized by using induction plasma technique ▪ Initial trials for spheroidization of irregularly shaped powders and their optimisation for AM applications ▪ Physico-chemical characterisation of synthesised nanopowders/ spheroidized powders ▪ Man power training

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Nanomaterials group Group incharge: Dr. P. V. Adhyapak	1. Dr. P. V. Adhyapak, PI 2. Mr. Sachin Karpe	Digitalization and Quantification Studies of High Sensitive Indigenous NO _x Sensor and its Optical Calibration. Brief details of work: <ol style="list-style-type: none">1. Synthesis and characterization of nanostructured materials sensitive towards NO_x.2. Electrical and optical sensing characterization of the developed materials.3. Preparation of proto-type NO_x sensor.4. Digitalization and calibration of developed electrical and optical NO_x sensor.
	1. Dr. P. V. Adhyapak, PI 2. Mr. Sachin Karpe, Collaborator : (CDAC (H))	Development of Smart Parking Management system using sensors, IoT and GIS technologies. Brief details of work: <ol style="list-style-type: none">1. Development of an IoT device and interfacing CNG, NO_x, SO_x, and CO₂ sensors to monitor pollution levels in the parking infrastructures2. Integrating occupancy sensors within the parking infrastructure to identify free/occupied lots within the infrastructure.3. Displaying the sensor information on a GIS system and generating a positional spread of the pollution levels within the parking infrastructure and occupancy layout.
	1. Mrs. Amruta Bang, PI Women Scientist	Self powered breath analyzer cum e-skin for potential health monitoring based on piezoelectric nanogenerator Brief details of work: <ol style="list-style-type: none">1. Development of self-powered Nanogenerator for Breath Sensing.2. Development of Self-powered e-skin for diabetes detection.

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Electronic Packaging Group (EPG) Dr. Shany Joseph (Sc. D)	Dr. Shany Joseph 1. Dr.Shany Joseph 2. Dr Ranjit Hawaldar 3. Dr. Ranjit Kashid 4. Dr Vijaya Giramkar 5. Mr Janardhan Gadde 6. Dr. Punam Jadhav	PN/SP/079 Development of Micro Solid Oxide Fuel Cells (μ -SOFC) in LTCC Technology <ul style="list-style-type: none"> • Synthesis of electrolyte, cathode and anode materials and their characterization • Preparation of Half cells and characterization • Preparation of planar SOFC and characterization • Fabrication of SOFC integrated LTCC packages with gas flow channels and integrated heaters for testing at H₂e • Preparation of final SOFC device in LTCC as per final design for demonstration
	Dr. Shany Joseph 1. Dr.Shany Joseph 2. Dr Ranjit Hawaldar 3. Mr Janardhan Gadde 4.Dr. Ranjit Kashid 5. Dr Vijaya Giramkar 6. Mr. Hrithik Kale 7.Ms. Aishwarya K P (PA-1) 8. Mr. Rohan Darve(PA)	<ul style="list-style-type: none"> • Fabrication of different designs of LTCC based packages with micro-channels and jet-impingement designs • Testing of devices at IITB and design modification • Fabrication of specified number of packages for cooling of 200W and 350 W processor for CDAC • Preparation of Coderite and glass material for tape casting and their characterization • Preparation of LTCC tapes using these indigenous materials. • Fabrication of final device using CMET's LTCC tape and submit the required Number to CDAC
	1. Dr. Shany Joseph 2. Dr Ranjit Hawaldar 3. Dr. Vijaya Giramkar 4. Dr. Ranjit Kashid 5. Mr Janardhan Gadde 6. Mr. Pankaj Jagdale (PA-1) 7. Ms. Jesly Joseph (PA – 1) 8. Ms. Jyoti Kondhalkar (PA) 9. Ms. Shradha Jadhav (Administrative Assistant)	<ul style="list-style-type: none"> • Synthesis of LTCC material, Silver, Silver- palladium • Preparation of resin- LTCC/Ag/Ag-Pd/carbon composite • Additive manufacturing trials and its optimization • Development of 3d Printer in collaboration with M/s J G robotics, Mumba • Additive manufacturing of LTCC Package for packaging of optical chip

	<p>Dr Ranjit Hawaldar</p> <ol style="list-style-type: none">1. Dr. Shany Joseph2. Dr. Ranjit Kashid3. Dr. Vijaya Giramkar4. Mr Janardhan Gadde	<p>PN/TS/018</p> <p>Fabrication at high temperature spiral coils/probes using LTCC technique</p> <ul style="list-style-type: none">• Fabrication of eddy current sensor using LTCC as per specified design• Testing of sensors at NML• Fabrication of next set of sensors as per modified design <p>Total three iterations to be tried.</p>
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**CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY
(C-MET), HYDERABAD
WORK ALLOCATION of NON TECHNICAL STAFF**

Sl. No.	Name	Work allocation of staff
1	G K Venkatesan Administrative Officer	Head of Office. All establishments, Purchase & Stores and General Administration of the Laboratory including APIO under RTI.
2	Sh. V. Nageswara Rao Finance Officer	Preparation of Budget Estimates/ Revised Estimates, Pay and Allowances, NPS registration, Audit, Finalization of Accounts, Recovery and Remittance of statutory taxes and filing of IT , GST and professional tax returns, Project management and control accounting , Issue of Utilization Certificates, Scrutiny and Examination of Project, MoU, ToT proposals and Purchase files. Staff claims, Supplier's bills, Letter of Credit and Foreign payments , PFMS –EAT module, Generating , Compiling and Submission of Financial information/data Member of Purchase and Services Committee, SVC, TOC and JPMC.
3	A. Lakshmi Vasudha, OA-I	Preparation of Pay & Allowances Statutory remittances, Processing of Bills w.r.t. Procurement files, Payment of Consolidated emoluments of Project , Co-ordination of work related to Internal Audit and CAG Audit, Verification of F-CSTs, Financial Sanctions on Procurement files, Medical Reimbursement claims, TA settlements, Advance Settlements, Reimbursement of Children Education Allowance, Canteen Allowances, News Paper Reimbursement towards purchase of News Paper LTC settlements
4	A. Kausalya, OA – II	Secretariat Assistance to Director Preparing POs in respect of procurement through Cash/Credit Purchase RC for procurement of Gas Booking of vehicles Library In-Charge
5	T. Avinash, OA – II	Tally Voucher entries, Processing of bills for payment, PFMS
6	A. Sahadev, OA – III	Stores and General Administration a) Stock entries in stores registers under respective projects b) Monitoring CPWD works c) Disposal of stores d) Recruitment of manpower under Hafnium Project e) Security & House Keeping staff f) GeM Contract in r/o Security, Housekeeping & their payment

7	K. V. S. Krishna Prasad, OA – III	<p>1) Administration & Establishment: Recruitment, RTI Replies preparation, Leave Account, LTC Claims, Electricity & Telephone Bills.</p> <p>2) Purchase : Procurement cases, Conducting SPC & SSC Meetings, placing POs, follow-up release of payment, AMCs, GeM Procurement, etc.</p>
8	<p>A. K. Tiwari, Office Clerk, (Posted at C-MET's Registered Office, New Delhi)</p>	<ol style="list-style-type: none"> 1. To coordinate with various division/groups in MeitY for inputs and other administrative needs for the ongoing and new projects related to C-MET and EMCD Division. 2. Responsible for arranging various meetings/Video Conferencing for C-MET and EMCD Division. 3. Arranging logistic support to members of GC & EC meeting of C-MET & and other meetings including Working Group of EMCD Division. 4. Preparation of draft sanctions/administrative orders for sponsored projects under EMCD Division. 5. Preparation of draft closure notes for sponsored projects. 6. Generation of online sanction for C-MET core fund/sponsored projects and its follow up at various stages. 7. Submission of UCs of various implementing agency for liquidation to PAO, MeitY related to C-MET and EMCD Division. 8. Any other work assigned by GC (R&D E), Director, EMCD and other Scientific Officers of EMCD Division, MeitY and C-MET from time to time
9	Lakshman, SM – II	Despatch, File movement, Supervising the lawn maintenance & other misc. work
10	K. Padma, SM – I	Cleaning & Gardening Work

**CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY
(C-MET), HYDERABAD
WORK ALLOCATION TECHNICAL STAFF**

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Refractory Metals Processing (Ultra-Pure & Special Materials) Group Dr. Raghu C Reddy	Dr. Raghu C Reddy Ms. K Bharathi Dr. Narendra Nasani Mr. J .V. Rao Mr. Angad Choudhary Mr. Mowlali Shaik Mr. C Kishore	Processing and Supply of Hafnium Sponge Regular supply of Hafnium sponge to VSSC against purchase order or MoU. Hafnium sponge is being prepared starting from Zr scrub raffinate received from NFC. The processes involved are solvent extraction, hydroxide preparation, calcinations, briquetting, carbo-chlorination, Kroll reduction, Vacuum distillation, sponge shredding and packaging. Besides, characterization of samples at different level, safety of the systems and man power, maintenance of plants, machinery, electrical, instrumentation and control systems for trouble-free operation of the plant, interaction with the sponsoring organization, etc. are the works carried out in the project. Presently processes are continued to supply 70 Kg Hafnium sponge against purchase order received from VSSC in February, 2021. Another purchase order is expected shortly for which quotation is being sent @ Rs.2.83 lakhs per kg for 70 Kg Hf sponge. Besides, Rs.76.00 lakh worth systems (under VSSC funding) are being procured for modifications / up-gradations of the systems.
Ultra High Pure Materials Group Dr. V. N. Mani	Dr. Y. Purushotham Mr. K . Balaraju Mr. S .N. Tadaka	Purification of Germanium and Zinc <ul style="list-style-type: none"> • Scrap Germanium purification by Induction zone refining • Purification of Zinc by vacuum distillation followed by resistive zone refining • Conversion of zone refined Zinc ingot in to <3 mm granules. • Development of processing technologies and IPR
	Dr. D. S. Prasad Mr. P. P. Srinivasa Kumar	Feasibility study for development of process technology to recover valuable materials from end-of life silicon solar modules <ul style="list-style-type: none"> • To identify suitable physical methods to separate components of Si- Solar module • To optimize chemical methods for extraction of metals namely Pb, Cu & Sn, etc. • To recover solar grade silicon that includes removal of back surface field (BSF) and emitter • To identify environmentally sound method to treat waste chemicals • To fine tune the optimized parameters at 10 Kg per batch size & to extract valuable materials from waste Si-solar modules.

<p>Silicon Carbide Group</p> <p>Dr. Sandeep Mahajan</p>	<p>Dr. Sandeep Mahajan Dr M.V. Rokade</p>	<p>SiC single crystal bulk growth process development</p> <ul style="list-style-type: none"> • Growth run and optimization of process parameters (temperature, pressure, source to seed distance, coil position, coil movement, gas flow etc) to get high resistive SiC single crystal boule. • Characterization of grown SiC boule. • Regular maintenance of PVT reactor and attached peripheral like gas generator, UHP gas lines, 100 KVA DG set, 100 KVA UPS, Chiller, Clean room AHU, etc. • Draft report and presentation preparation for PMRC, EB, SC, etc. • Procurement of UHP materials - SiC seed crystal, SiC source material, ultrahigh pure gases and graphite consumables (Seed holder, crucible, heater etc).
<p>RoHS testing Group</p> <p>Dr. U. Rambabu</p>	<p>Dr. U. Rambabu Mr.B. Mahender Dr. K. Ramaswamy</p>	<ul style="list-style-type: none"> • Revenue generation through RoHS testing services --- Testing of Electrical, Electronic Equipment (EEE) for RoHS compliance and elemental analysis of various In house (C-MET) samples. Maintaining of NABL accreditation in the scope of chemical testing. • Skill development training program for Scheduled Caste & Scheduled Tribe students on E-waste dismantling and testing of Restricted Hazardous Substances (RoHS) – Taking regular classes and training on E-waste dismantling/segregation and on RoHS testing using EDXRF spectrometer, ICP-OES, Ion chromatography, UV-Vis spectrometer, Gas chromatography Mass Spectrometer (GC-MS) and sample preparation techniques like soxlet extraction, Sonication, open digestion and microwave digestion system. • Delivering RoHS awareness lectures at Industry, Institutions outreach programs, being conducted by different organizations. • Publishing the research articles in International journal of high repute, etc.
<p>CoE on E-Waste Group</p> <p>Dr. R Ratheesh</p>	<p>Dr. R Ratheesh Dr. S.Rajesh Kumar Dr. Y Purushotham Dr. U Rambabu Dr. D. S. Prasad Dr. Ajay Kaushal Mr.Ch. Sudheer</p>	<p>Establishment of Centre of Excellence on E-waste management</p> <p>Recovery of valuable metals from spent printed circuit boards Scaling up of technology from 100kg/day capacity to 1000kg/day capacity Development of process equipments for PCB recycling Techno economic feasibility of the process and technology transfer Feasibility studies on the development of recovery of other metals from PCBs</p> <p>Development of Processing Technologies for Lithium –ion Battery recycling and IPR</p> <p>Development of Hydrometallurgical recycling technology for the recovery of Li, Co, Mn and Ni from EoL Li ion batteries.</p> <p>Extraction of rare earths from EoL Permanent Magnets Extraction of rare earth oxides especially Nd, Pr and Dy from end of life Hard Disc Drive and lap top permanent magnets by acid leaching, solvent extraction and calcinations.</p>

		<p>M.Tech in E-waste Management and Resource Engineering Course</p> <p>Development of process technology for the recovery of valuable materials from end-of life silicon solar modules</p> <p>Skill Development Activities</p> <p>Organizing awareness programs, workshops on E-waste Management Hands on experience E-waste dismantling & segregation</p>
SENDUST Project Dr. Raghu C. Reddy	Dr. Raghu C. Reddy Dr. Narender Nasani Mr. Angad Choudhary Mr. C. Kishore	<p>Development of flaky Fe-Si-Al alloy powders suitable for applications in Tunable Microwave Absorption.</p> <ul style="list-style-type: none"> • Work elements involve, development of Sendust alloy of suitable composition for microwave absorption applications by induction melting. Shaping of the powders by ball milling and heat treatments to get flaky powders. Coating of the flaky sendust powders on to copper substrates and testing its functionality.
Carbide derived carbon for storage applications Dr. S. Rajesh Kumar	Dr. S. Rajesh Kumar Mr. Ch. Sudheer	<p>Development, process optimization and supply of carbide-derived-carbon</p> <p>Development of of active carbon from metal carbides with narrow pore size distribution (0.6- 3.0nm) and high surface area (>1500m²/g) for charge storage applications Optimization of process parameters such as precursor characteristics, temperature, chlorine flow etc. chlorination experiments on continuous basis and supply to VSSC for further characterization and super capacitor fabrication and evaluation.</p>
MEMS Sensors Dr. Akshdeep Sharma NaVIC Dr R. Ratheesh	Dr. Akshdeep Sharma Dr. Ratheesh	<ul style="list-style-type: none"> • Design and Fabrication of MEMS Bionics Senors for AUVs • Development of Indigenous Antennas for Navigation with Indian Constellation (NavIC)
Web Administration Dr. S. Rajesh Kumar	Mr. M. Ramanaji	C-MET web design and maintenance

**CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY
(C-MET), THRISSUR
WORK ALLOCATION OF NON TECHNICAL STAFF (ADMINISTRATION)**

Sl No.	Name	Work Allocated
Administrative Section		
1.	Sh. Anilkumar T.K., A.O	Administrative officer, HOD
2.	Smt. Indira K.N., OA-II	All Purchase related works (Core and Sponsored Projects)
3.	Sh. Karthik Krishnaprasad, OC	All work related to Establishment & General Administration
4.	Sh. Krishnadas M.B., MTS	Dispatch related works
Finance Section		
1.	Sh. Paramasivan, SA-VI	Financial Officer (Acting)
2.	Smt. S.R. Deepika, SA-V	<ul style="list-style-type: none"> • Checking of Vouchers. • All payments including salaries. • Preparation of MIS, BRS etc. • Preparation of annual accounts statements. • Tally and PFMS entries. • Issue of receipts for grants and all other receipts. • Income tax and GST work and remittance of TDS, GST. • Opening of L/C, Wire transfer, FD, renewal of FD. • Issue of project commencement and closure intimations. • Preparation of invoices in r/o characterization, LDs.
3.	Smt. M.P. Bindumol, SA-IV	<ul style="list-style-type: none"> • Preparation of Vouchers and passing of JVS • Salary related works including sponsored project. • Maintenance of PO and MRIR Register/files. • Maintenance of PF, Advance, medical register and tallying with GL etc. • Assets Register's updating/maintenance. • Annual PF details preparation. • Settlement of tour bills. • Professional tax related work. • Settlement of personal claims like medical bill etc. • PFMS entry
4.	Sh. V.M. Sivaraman, MTS	Bank related work

**CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY
(C-MET), THRISSUR
WORK ALLOCATION OF TECHNICAL STAFF (ADMINISTRATION)**

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Nanomaterials, Dr. Abhisek Choudhary	Dr. Abhisek Choudhary, Mrs. V. Priyadharsini	<p>1. Development of ceramic dielectric thin film capacitors for hybrid electric vehicle applications. Funded by SERB, DoI (18.03.2020) – DoC (17.09.2022). In this project, following major works needs to be carried out:</p> <ul style="list-style-type: none"> • Design of novel ceramic dielectric material composition(s). • Spin-coating of Ceramic thin films on non-noble metal electrodes. • Fabrication of Ceramic dielectric thin film capacitors and characterization. • Prototype ceramic dielectric capacitor for DC-AC inverters in Hybrid Electric Vehicles. • Trial runs at end-users place.
	Dr. T. Karthik, Dr. T. Radhika, Dr. Abhisek Choudhary, Mrs. V. Priyadharsini, Mrs. K.G. Vasanthakumari, Mr. E. K. Sunny, Mr. S. Susanth,	<p>2. Design and development of Ultrasonic transducer probes for medical imaging applications. Funded by MeitY, DoI (13.08.2021) – DoC (12.08.2024). In this project, following major works needs to be carried out:</p> <ul style="list-style-type: none"> • Design of ultrasound probes • Development of piezoelectric transducer • Development of backing an matching layers • Fabrication of transducer probes • Validation of developed probe under class 2 clinical trials

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Sensors, Actuators and Graphene groups Dr. A. Seema	Centre of Excellence (CoE) in Intelligent Internet of Things (IIoT) Sensors, PI: Dr. A.Seema	Centre of Excellence (CoE) in Intelligent Internet of Things (IIoT) Sensors Dr. M.N. Mrualidharan is leading Thermal sensors, Humidity sensors and Level sensors using thermistors
	Co.PI : Dr. Karthik T.	Mohammed Shafi is looking IIoT and circuit side of the sensor
	Dr. Arul Kashmir	
	Dr. M.N.Murlidharan	Sridhar Krishna is looking after the material aspects of the sensors
	Team members from sensors, actuators and Graphene groups Shri. Sridar Krishna & Shri. Mohammad Shafi	The Project co –ordination is done by Dr. A. Seema
	To evaluate the suitability of the graphene powder supplied by CUL for supercapacitor applications PI: Dr. M.N. Muralidharan	To evaluate the suitability of the graphene powder supplied by CUL for supercapacitor applications Dr. M.N. Mrualidharan is leading the team. Characterization is taken care by him Mohammed Shafi is on testing of capacitors Sridhar Krishna is looking after graphene synthesis
	Co PI: Dr. A. Seema	
	Team Members Shri. Sridar Krishna and Shri. Mohammad Shafi	The Project co –ordination is done by Dr. A. Seema
	Entrepreneurial Training Programme for Scheduled Tribe Communities to produce Solar Lanterns/LED bulbs for Lighting Applications PI: Dr. A. Seema	Entrepreneurial Training Programme for Scheduled Tribe Communities to produce Solar Lanterns/LED bulbs for Lighting Applications Dr. M.N. Mrualidharan is looking on training side. Mohammed Shafi is on circuit design
	Co PI: Dr. M.N. Muralidharan	Sridhar Krishna is looking graphene for supercapacitors Dr. A. Seema: Product design and development

	<p>Entrepreneurial Training Programme for Scheduled Caste Communities to produce Digital Thermometers PI: Dr. A. Seema</p>	<p>Entrepreneurial Training Programme for Scheduled Caste Communities to produce Digital Thermometers Dr. M.N. Mrualidharan is looking on training side. Mohammed Shafi is on IC programming Sridhar Krishna is looking after thermistors</p>
	<p>Co PI: Dr. M.N. Muralidharan</p>	<p>Dr. A. Seema: Product design and development</p>
	<p>Dev. of Aerogel Supercapacitor based Power Module for Application in Voter Verifiable Paper Audit Trail of EVM PI: Dr. A. Seema</p>	<p>Dr. A. Seema is heading the entire technical activities of the project</p>
	<p>Co PI: Dr. Stanly Jacob</p>	
	<p>Technology transfers 3D analysis system for wearable device for the prediction of tumour parameters PI: Dr. A. Seema Four technologies are at different stages after obtaining the EoI</p>	<p>Murata Business India Pvt. Ltd has already paid the 50% of ToT fee. Dr. M.N. Muralidharan will take care of training side Dr. A. Seema will take care of Technical aspects</p>

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Thin Film & Plasmonic Group	Dr. S.N. Potty, (PI)	Development of a new and cost effective biosensor based on transparent conducting oxide thin films working in near IR frequency.
Dr. S.N. Potty	Dr. Rapaka S Chandra Bose	<p>The group has developed cost-effective plasmonic materials for near infrared and visible wavelengths for various gas sensing and biosensing applications. The new materials are cheap alternatives to the expensive noble metals used for plasmonic device applications. These metal oxide planar films can be used for developing disposable chips for several biosensing applications. Using this engineered material, C-MET Thrissur has developed a cost-effective portable biosensor for detecting food borne pathogens (such as campylobacter, shigella etc), jointly with Rajiv Gandhi Centre for Biotechnology, RGCN (under DBT) Thiruvananthapuram. The group is interacting with a few institutes for developing cost effective biosensors.</p>
	Mr. I. Packia Selvam,	<p>Dr. Rapaka S Chandra Bose</p> <ul style="list-style-type: none"> ➤ Joined the institute recently ➤ Looking after the project related activities ➤ Helping the PI to frame new proposals ➤ Initiating proposals in thermoelectric & plasmonic areas <p>Mr. I. Packia Selvam, ST-V</p> <ul style="list-style-type: none"> ➤ Plasmonic thin film development ➤ Biosensor fabrication ➤ Transparent heater fabrication ➤ X-diffraction analysis ➤ Hall measurement analysis ➤ Procurement of raw materials and equipment

Name of Group & Group In-charge	Project In-charge & Team Members	Name of Project & brief details of work
Aerogel and Energy Materials Lab Dr Stanly Jacob.K,	Dr Stanly Jacob.K, Smt . Rani Panicker N Shri P.A. Abraham	<p>Project title : Dev. of high energy density lithium Ion Capacitor with graphite/carbon aerogel through safe prelithiation method (TH/SP/069)</p> <ul style="list-style-type: none"> ➤ Planning and execution of experiments for the development lithium ion capacitor using graphite and carbon aerogel ➤ Characterisation of electrode materials using analytical techniques such as BET, FTIR etc. ➤ Fabrication of Lithium Ion Capacitor ➤ Characterisation of lithium on capacitor using electrochemical methods ➤ Procurement of essential raw materials and consumables required for the project ➤ Assisting in the maintenance of equipment's required for the project work ➤ Preparation of organic aerogel ➤ Conversion of organic aerogel into carbon aerogel ➤ Fabrication of lithium Ion Capacitor ➤ Assisting in the maintenance of equipment's required for the project work ➤ Procurement of essential raw materials and consumables required for the project
Multilayer Ceramics, T. Radhika	T. Radhika, (Co-PI) K.G. Vasanthakumari	<p>Design and development of ultrasonic transducer probes for medical imaging (TH/SP/075)</p> <p>Objectives of the Project:</p> <ul style="list-style-type: none"> • Design of ultrasound probes • Development of piezoelectric Transducer Development of backing and matching layers • Fabrication of transducer probes • Validation and clinical trials of developed probes <p>Specific work allocated:</p> <ul style="list-style-type: none"> • Development of suitable matching layer and its property evaluation.
<p>A Project Proposal was submitted as part of Innovation Centre for Graphene Devices and 2D materials (ICGDM).</p> <p>✓ As part of this programme, it is proposed to develop 2D materials for Wearable strain sensors, EMI shielding, Flexible printing inks etc.</p>		

1.	K.G. Vasanthakumari	<ul style="list-style-type: none"> ✓ Preparation of Matching material of US probe through Tape casting and other methods and its property studies. ✓ Preparation of 2D MXene and its property evaluation ✓ File works related to projects
Multilayer Ceramics Group (MLC) Dr. Karthik T.	Dr. Karthik T (P.I) Group Members : Sh. E. K. Sunny Sh. Susanth S	<p>Project Name: Textured lead free Na_{0.5} Bi_{0.5} TiO₃, based lead free Multilayer Actuators (TH/SP/067) Duration: May-2019- May 2022</p> <p>Details of the work:</p> <ul style="list-style-type: none"> ✓ Development of Na_{0.5} Bi_{0.5} TiO₃ based lead-free piezo composition with high strain ✓ Development of template particles through MSS technique ✓ Development of textured piezoceramics through TGG and RTGG ✓ Development of Random and textured Multilayer actuators through ML processing
	Dr. Karthik T (P.I) Group Members : Sh. E. K. Sunny Sh. Susanth S	<p>Project Name: Design and development of ultrasonic Transducer probes for medical imaging (TH/SP/075) Duration: Aug-2021- Aug-2024</p> <p>Details of the work:</p> <ul style="list-style-type: none"> ✓ Development of lead based piezo composition with high d₃₃ ✓ Development of PZT based ceramics and optimization of the dimensions to operate at the frequency between 2-10 MHz, suitable for curvilinear and linear probes. ✓ Stacking of all the layers and to achieve the desired acoustic properties.
Microwave Materials Dr. Arul Kashmir	Dr. Arul Kashmir (P.I)	<p>TH/SP/073 - Development of Microwave Absorber Materials Funding Agency: BRNS Total Outlay: 52.0 Lakhs Duration: 09/2020 to 09/2022 Role: Principal Investigator</p> <p>The project involves in the development of Microwave absorber (MWA) materials and its processing to fabricate flexible laminates. The MWA substrates are highly useful for the reduction of cross-over frequencies, stealth technologies and space applications. This project aims in developing the MWA substrates using a polymer – ceramic composites with larger size of 100 cm x 100 cm size, and absorbing in the frequency range of 1 GHz to 4 GHz. In addition to that, the dielectric and magnetic properties evaluation to meet the proposed Reflectivity Loss % by systematic control over the size/shape/surface of ceramic composites are the key research that are in progress.</p>

TH/SP/074 – Centre for Excellence in Intelligent IoT sensors

Funding Agency: MeitY

Total Outlay: Overall outlay 41 Crores

Duration: 07/2021 to 07/2026

Role: Co-Investigator (for three biomedical sensor products development)

Under the CoE in IIOT sensors, Dr Arul Kashmir has proposed and undertaken the following 03 products development under the stream of Biomedical sensors.

1. Portable ECG sensors,
2. Wearable strain sensors for Non-verbal communication, and
3. Electrodermal (pH) sensors.

Developing the new polymer and/or polymer-ceramic composites and fabricating them as a probe for detecting the human body signals to sense the vital functions are the key areas we focus in the above stream. Also, this projects aims in developing sensors with selectivity, accuracy, sensitivity and reliability to meet the commercial standards.

<p>Microwave Materials Group</p> <p>Dr. Rajendra P. Panmand</p>	<p>Dr. Rajendra P. Panmand</p> <p>Mr. Prasad K.</p> <p>Mr. Arun N. S.</p>	<p>Project Title: Development of Polybutadiene/ ceramic composite laminates and Substrate Integrated Waveguides (SIW) for microwave and millimetre wave circuit applications.</p> <p>Brief details of work:</p> <p>Objectives</p> <ul style="list-style-type: none"> • Development of high dielectric ($\epsilon_r > 60$) and high quality factor ($Q_u > 8000$) microwave ceramic filler materials • Theoretical modeling of effective dielectric constant of Polybutadiene/ceramic composite laminates • Preparation of Polybutadiene/ceramic laminates through Bunbery Mixing, Extrusion, Calendering and Hot pressing (BMECH) processes • Microwave characterization of laminates • Copper cladding of Polybutadiene/ceramic laminates • Substrate Integrated Waveguide (SIW) circuit design using HFSS • Fabrication of SIW circuits for Millimetre wave applications <p>Achievement</p> <ol style="list-style-type: none"> 1. Developed ceramic filler for microwave laminates with low (for 6, 8), medium (for 9.8) and high (for 14.5) dielectric constant. 2. Optimized the silane coating process on filler to avoid moisture absorption. 3. Optimized the milling the ceramic and polybutadiene (PB) using two roll mill. 4. Fabricated the ceramic filler- PB laminates with different dielectric constant i.e. 14.5, 13, 9.8 and 8. 5. Optimized the process of copper cladding of Polybutadiene/ceramic laminates 6. Development of ceramic filler - PB laminates with dielectric constant ~ 6 is in progress.
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