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GOVERNMENT ENGINEERING COLLEGE
GANDHINAGAR
॥ कर्ममयं ज्ञानं एवं ज्ञानमयं कर्म ॥

STUDENTS' SOCIETY OF METALLURGY ENGINEERING GANDHINAGAR
SSMEG
ESTD-2012
Regd.No. GUJ/2051/Gandhinagar

NEWSLETTER

METALLURGY DEPARTMENT

(NBA ACCREDITED 2025-28)

JULY 2025 to DECEMBER 2025

METALLURGY

राष्ट्रीय प्रत्यायन बोर्ड
चौथा तल, ईस्ट टावर, एन. बी. सी. सी. प्लेस, भीष्म पितामह मार्ग, प्रगति विहार, लोधी रोड, नई दिल्ली -110003
NATIONAL BOARD OF ACCREDITATION
4th Floor, East Tower, NBCC Place, Bhisham Pitamah Marg, Pragati Vihar, Lodhi Road, New Delhi 110003

File No. 20-78-2013-NBA **Date 05-06-2025**

To

The Principal
Government Engineering College,
Gandhinagar Nr. G.E.B. Cross Road,
Sector - 28, Gandhinagar –Gujarat- 382028

Subject: Further accreditation status on the basis of Compliance Report of the program in Tier-II applied by Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.

Sir,

This is regarding Compliance Report submitted by **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** for the UG Metallurgy program which was accredited by National Board of Accreditation (NBA) in Tier-II for academic years 2022-23 to 2024-25 i.e. upto 30/06/2025.

2. An Expert Team conducted data verification of the program on **13th April,2025**. The report submitted by the Expert Team was considered by the concerned Committees constituted for the purpose in NBA. The Competent Authority in NBA has approved the following accreditation status to the program as given in the table below:

Sl. No.	Name of the Program(s) (UG)	Basis of Evaluation	Accreditation Status	Period of validity	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1.	Metallurgy	Tier-II June 2015 Document	Accredited	Academic Years 2025-2026 to 2027-2028 i.e. upto 30-06-2028	Accreditation status granted is valid for the period indicated in Col.5 or till the program has the approval of the Competent Authority, whichever is earlier

3. It may be noted that only students who graduate during the validity period of accreditation, will be deemed to have graduated with an NBA accredited degree.

4. The program has been granted accreditation for further 3 years. **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** should submit fresh online application through eNBA portal not before five months from the expiry of validity of accreditation mentioned above.

Contd./_

Tel: +91 11 2436 0620-22, 2436 0654; Telefax: +91 11 4308 4903
Website: https://www.nbaind.org |Email:membersecretary@nbaind.org

5. The accreditation status awarded to the program as indicated in the above table does not imply that the accreditation has been granted to **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** as a whole. **As such the Institution should nowhere along with its name including on its letter head etc. write that it is accredited by NBA because it is program accreditation and not Institution accreditation. If such an instance comes to NBA's notice, this will be viewed seriously.** Complete name of the program(s) accredited, level of program(s) and the period of validity of accreditation, as well as the Academic Year from which the accreditation is effective should be mentioned unambiguously whenever and wherever it is required to indicate the status of accreditation by NBA.

6. The accreditation status of the above program is subject to change on periodic review, if needed by the NBA. It is desired that the relevant information in respect of accredited program as indicated in the table in paragraph 2, appears on the website and information bulletin of the Institute.

7. The accreditation status awarded to the program as indicated in table in paragraph 2 above is subject to maintenance of the current standards during the period of accreditation. If there are any changes in the status (major changes of faculty strength, organizational structure etc.), the same are required to be communicated to the NBA, with an appropriate explanatory note.

8. A copy of the Report of the Visiting Team in respect of the above program is enclosed.

Yours faithfully,

(Dr. Anil Kumar Nassa)
Member Secretary

GOVERNMENT ENGINEERING COLLEGE
SEC-28. GANDHINAGAR

ABOUT THE INSTITUTE

Established in 2004, Government Engineering College, Gandhinagar (GEC-Gn) takes pride in its highly motivated students. Our students are life-long assets that help this institute to continuously evolve and work towards its Vision. Approved by AICTE. The College is administrated by Directorate of Technical Education, Gujarat State, Gandhinagar. GEC Gn is affiliated to Gujarat Technological University. GEC-Gn offers its students a wide range of courses like Biomedical, Computer, Electronics & Communication, Instrumentation & Control, Information Technology and Metallurgy.

VISION OF THE INSTITUTE

To be a premier engineering institution, imparting quality education for innovative solutions relevant to society and environment.

MISSION OF THE INSTITUTE

- To develop human potential to its fullest extent so that intellectual and innovative engineers can emerge in a wide range of professions.
- To advance knowledge and educate students in engineering and other areas of scholarship that will best serve the nation and the world in future.
- To produce quality engineers, entrepreneurs and leaders to meet the present and future needs of society as well as environment.

ABOUT THE DEPARTMENT

The Metallurgy Department since its inception in 2008 is a backbone of GEC-Gandhinagar's events, research activities and initiatives. It is a unique initiative of Government of Gujarat in the present science and technology education and research scenario of India. At present, the department offers a four year undergraduate course in engineering. Faculty members are good blend of industrial/ academic research experienced, studied from national and state reputed institutes. Department has developed COQ (Centre for Quality) NDT which established under "Vibrant Gujarat–2019"- Financial MOU in collaboration with Gulfnde along with various well equipped metallurgical laboratories.

Currently, the focus of department activities are multi-directional with an emphasis on both research and education. Our collaborations with FCIPT, CFER, INDUS University, PDEU, IIM–Baroda Chapter, IIF- Ahmedabad Chapter, ASM International - Gujarat Chapter, IE–Gujarat Section, etc. Students are encouraged and supported to actively participate in various curricular and non-curricular activities at different level.

VISION OF THE DEPARTMENT

Developing excellence in Metallurgy Engineering education through research, development innovation and team work for the benefit of society and environment.

MISSION OF THE DEPARTMENT

- To prepare competent metallurgy engineers who can apply metallurgical fundamentals to control and manage different metallurgical and materials processing operations to produce quality metals products in industries.
- To deliver information about current trends in the field of metallurgy and materials to the students.
- To encourage students to work on innovative projects related to metallurgy engineering for managing defects free, economical, energy efficient products, processes or devices to best serve the nation to fulfil the socio-economic, techno-commercial and environmental needs.

LIST OF FACULTY MEMBERS WITH QUALIFICATION

Sr. No.	Name of Faculty	Qualification	Designation
1	Dr. I. B. Dave	Ph.D (Met. & Mat. Engg.)	Professor & Head
2	Dr. D. G. Sharma	Ph.D (Metallurgy)	Associate Professor
3	Dr. H. H. Jadav	Ph.D (Metallurgy)	Associate Professor
4	Prof. S. I. Patel	ME (Met. & Mat. Engg.)	Assistant Professor
5	Dr. P. K. Nanavati	Ph.D (Met. & Mat. Engg.)	Assistant Professor
6	Dr. D. V. Mahant	Ph.D (Met. & Mat. Engg.)	Assistant Professor
7	Dr. H. H. Thakar	Ph.D (Metallurgy)	Assistant Professor
8	Prof. R. C. Ghanghas	ME (Met. & Mat. Engg.)	Assistant Professor

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ACHIVEMENTS OF THE FACULTIES

Dr. I B Dave has published a research papers and a conference presentation in reputed international journals/conference. (Details are given in Research activities)

Successfully supervised PhD candidate Dr. Ravi Dave for his research in "Experimental Investigation on Hybrid Welding of Stainless Steel using Advanced Gas Metal Arc Welding (GMAW) Process" under GTU.

Completed AICTE - QIP - PG certificate program on "Advanced Metallic Alloys for Energy Storage Application" during 16/06/2025 to 31/12/2025 organized by SVNIT Surat.

Delivered an expert talk on "Types of steels and their applications" to Government Engineering College, Patan, students of 3rd Semester, Mechanical Engineering Department during their visit at the Metallurgy department Laboratories at Government Engineering College, Gandhinagar on 12/09/2025.

Dr. D G Sharma has published two research papers in reputed international journals. (Details are given in Research activities)

Has been granted Industrial Process Patent for Journal No. 49/2025 dated 05/12/2025, page no. 120773, application No. 202521044151 A. (Details are given in Research activities)

Delivered an expert talk on "Corrosion of Metals and Alloys" to Government Engineering College, Patan, students of 3rd Semester, Mechanical Engineering Department during their visit at the Metallurgy department Laboratories at Government Engineering College, Gandhinagar on 20/09/2025

Organized a technical visit at "COE - Additive Manufacturing", PDEU University, Gandhinagar on Friday, 29/08/2025.

Reviewed paper for different international peer review journals from Springer

Contributed for signing a Memorandum of Understanding (Strategic Partnership) between GTU - Institute of Technology and Research and Government Engineering College, Sector 28, Gandhinagar.

Coordinated an event for Government Engineering College, Patan, students of 3rd Semester, Mechanical Engineering Department visited the Metallurgy department Laboratories at Government Engineering College, Gandhinagar on 20/09/2025.

Contributed for work regarding inclusion of Green Hydrogen in the technical curriculum, at the Commissionerate of Technical Education, Gandhinagar from 04/08/2025 to 07/08/2025.

Dr. H H Jadav contributed for signing Three Memorandum of Understanding (Strategic Partnership) between ISNT Ahmedabad Chapter, Aditya High Vacuum Pvt. Ltd., Ahmedabad, and Ultra Tech, Ahmedabad and Government Engineering College, Sector 28, Gandhinagar.

ACHIVEMENTS OF THE FACULTIES

Dr. P K Nanavati delivered a session on "A Practical Overview for Future Engineers: Understanding Welding Codes, Standards, Specifications & Documentation" under the ASM Gujarat Mat-Talk Series on 14/10/2025 at Ahmedabad University, Ahmedabad, Gujarat.

Dr. P K Nanavati contributed a book Chapter on "Practical Aspects in Welding of Inconel/Inconel Alloys" for the book "Practical Aspects of Industrial Welding Processes," edited by Krishnan Sivaraman, J. Krishnan, and Vishvesh J. Badheka, has been published by CRC Press, an imprint of the Taylor & Francis Group.

Successfully completed an FDP on 'Joining Technologies for Metals' on the NPTEL platform with Topper (2%)—Gold Elite certification during July-Oct 2025.

Has joined the team IIW-India Ahmedabad Centre as a Co-Opt Member for 2025-26.

Dr. D V Mahant contributed for signing Two Memorandum of Understanding (Strategic Partnership) between IIF Ahmedabad Chapter, TDC Alloys and Government Engineering College, Sector 28, Gandhinagar.

Delivered a key note expert session on "The future of fabrication: A comparative look at Laser Vs Conventional Methods" at SLTL group gandhinagar under Insight initiative.

Dr. H H Thakar has published a research paper in reputed international journal. (Details are given in Research activities)

Contributed for state level mega placement camps organized by the Education Dept. Govt. of Gujarat during August-September 2025.

Contributed as division editor and reviewer for ASM handbook Volume 27.

Contributed for organizing institute Alumni meet-2024 and cultural events on 26/09/2025.

Coordinated an Industrial Visit for the 3rd semester students of the Metallurgy Department at Kalpataru Projects International Limited (KPIL), Sector-28, Gandhinagar on 28/11/2025.

Contributed for organizing a special placement and internship drives of Reliance India Ltd. at L D college of Eng. organized by DTE during December 2025.

Prof. R C Ghanghas was Topper (5%) in NPTEL Online course 'Joining Technologies for Metals' during July-October 2025 and secured 85% score (Elite- Gold Certificate).

Contributed for organizing institute Alumni meet-2024 and cultural events on 26/09/2025.

Coordinated an Industrial Visit for the 3rd semester students of the Metallurgy Department at Kalpataru Projects International Limited (KPIL), Sector-28, Gandhinagar on 28/11/2025.

PEDAGOGY SESSION

sr. no	Name of the speaker	Department	Topic delivered	Date
1	Dr. D.G. Sharma	Assistant Professor	"AI CONTENT DEVELOPMENT"	18/07/2025
2	Dr. H. H. Jadav	Assistant Professor	"AI CONTENT DEVELOPMENT"	18/07/2025

GLIMPSES OF EXPERT LECTURE

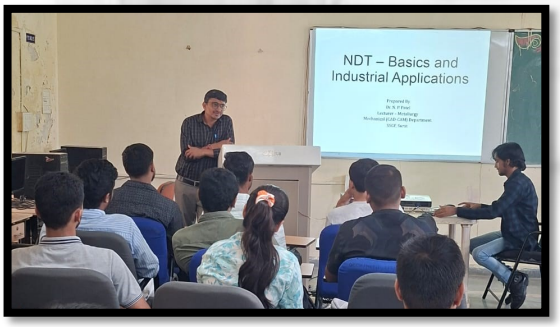
Sr. no	Date	Expert Details	Topic	Coordinators
1	22/08/2025	**Dr. Vandana J. Rao** Associate Professor, Metallurgical and Materials Engineering Department	**Bearing Failure Analysis**	**Dr. D. V. Mahant**
2	22/08/2025	**Dr. Mrunalkumar Chaudhari** Assistant Professor (Metallurgy), Mechanical Engineering Department, LD College of Engineering, Ahmedabad.	**Electron Microscopy**	**Dr. D. G. Sharma**
3	29/08/2025	**Dr. Ashish Shukla** Sr. Assistant Professor, NAMTECH – Gandhinagar	**Automation and Digitalization in the Automotive Industry**	**Dr. D. G. Sharma Dr. H. H. Jadav Dr. D. V. Mahant**
4	12/09/2025	**Dr. Naishadh Patel** Lecturer in Metallurgy Department L. E. College (Diploma), Morbi	**NDT Basics and Industrial Applications**	**Prof. R. C. Ghanghas Dr. D. A. Patel**

1. As part of the ASM Gujarat MAT-TALK series, a seminar was held on 29th August 2025, from 3:00 pm to 5:00pm at PDEU, Gandhinagar. Dr. Ashish Shukla, Senior Assistant Professor at NAMTECH – Gandhinagar, delivered a talk on Automation and Digitalization in the Automotive Industry, highlighting key technological developments and industry trends. The event was attended by Dr. D. G. Sharma, Dr. H. H. Jadav, Dr. D. V. Mahant, and 36 BE students from the 3rd, 5th, and 7th semesters of the Metallurgy Department, Government Engineering College, Gandhinagar. Students were also briefed about the AICTE Idea Lab at PDEU, providing them insights into innovation resources and project opportunities.

2. On August 22, 2025, Dr. Vandana J. Rao gave an expert lecture on "Bearing Failure Analysis." The session was attended by students of Metallurgy Department's third, fifth, and seventh semesters. A total of 24 participants benefited from the program. Students studying material behavior and component failures would greatly benefit from the lecture's insightful explanations of the principles of failure investigation in metallurgy, which were backed up by case studies. The session was coordinated by Dr. D. V. Mahant

3. An Expert lecture on “Electron Microscopy” Jointly Organized by Metallurgy Engineering Department, Government Engineering College, Gandhinagar & Students Society of Metallurgy Engineering Gandhinagar (SSMEG) on August 22, 2025. Lecture was delivered for BE (Metallurgy Engineering) Students of semester 3rd, 5th and 7th by Dr. Mrunalkumar Chaudhari, Assistant Professor Assistant Professor (Metallurgy), Mechanical Engineering Department, LD College of Engineering, Ahmedabad . Electron microscopy is vital for metallurgists to analyze a metal's microstructure, understand its mechanical properties, perform failure analysis, and identify contaminants or defects at high magnifications, far beyond what optical microscopes can achieve. A total of 24 Students and 05 faculties of Metallurgy department were benefited by the lecture.

4. An expert lecture on “NDT Basics and Industrial Applications” was organized by the department on the 12th of September 2025. The session was delivered by Dr. Naishadh Patel, lecturer in the metallurgy department at L. E. College (Diploma), Morbi. The students of semesters 3, 5 and 7 attended this lecture with full attendance. The lecture aimed to introduce the basic techniques involved in NDT and its critical role in industrial applications; this lecture successfully bridged the gap between the theoretical concepts and their practical application. The students have benefitted immensely due to the interactive offline mode of the session. This session was successfully co-ordinated by Prof. R. C. Ghanghas and Dr. D. A. Patel.



GLIMPSES OF "ALUMNI MEET 2025"

Sr. No.	Date	Name of Expert	Topic	Coordinators
1	**26/09/2025 11:00 am 12:00 pm**	**Mr. Dhruv Patel** Alumni student batch 2013 pass out GEC, Metellurgy department Founder & CEO, D3S Healthcare Technologies Co-Founder & CEO, Loop Robotics	**Driving the Future: Autonomous Mobile Robot Vehicles in industry 4.0 (Online)**	**Dr. H. H. Thakar, Prof. R. C. Ghanghas.**
2	**26/09/2025 12:00 pm to 1:00 pm**	**SSMEG office bearers**	**Sensitization of student's society and its importance (Offline)**	

The Department of Metallurgy Engineering organized an Alumni Expert Talk for all current and pass-out students on 26 September 2025 from 11:00 am onwards in hybrid mode. The session began with a 2-minute silence in memory of a student from the EC Department. Prof. R. C. Ghanghas welcomed the participants and introduced the alumni speaker. The event was both engaging and insightful, offering valuable career and technical guidance to students. Alumni experts and faculty members shared their experiences and memories. After the technical talk, SSMEG office bearers Mr. Keyur Shah and Mr. Hardik Ambaliya highlighted the importance of the student society. Former HOD Dr. G. H. Upadhyay spoke about the inception of SSMEG, and current HOD Dr. I. B. Dave encouraged students to become active members. Dr. H. H. Thakar expressed a vote of thanks to the Principal, HOD, faculty members, students, staff, and alumni for their support and participation. The event was coordinated by Dr. H. H. Thakar and Prof. R. C. Ghanghas.

STUDENT ACTIVITES

1. Swachhata Shapath

Date: 08/08/2025

Location: Block no 08, metallurgy department, GECG

On the 8th of August at 11:30 AM, the students and faculty of the metallurgy department took a pledge "Swachhata Shapath" to promote personal commitment to cleanliness.

2. PM Narendra Modi's Road Show

Date: 25/08/2025

Location: Nikol

Students from Semester 3 and 5 of the Metallurgical Engineering Department and students of other departments of GEC Gandhinagar, along with faculties members actively participated in the Prime Minister's Road Show Event.

STUDENT ACTIVITES

3. Teachers' Day Celebrations 2025

Date: 04/09/2025

Location: Block no 08, metallurgy department, GECG

The department celebrated Teachers' Day with warmth and enthusiasm, organized entirely by the students of Semesters 3, 5, and 7 as a heartfelt tribute to their professors. The event commenced on a traditional and auspicious note with the Saraswati Vandana, invoking the blessings of the Goddess of Knowledge. Following this, the professors shared engaging speeches and heartfelt experiences, providing valuable insights and cherished memories to the gathering. To lighten the mood, students conducted a fun and competitive round of Pictionary for the faculty. The celebration concluded joyfully with the cutting and distribution of cake and refreshments, making the day memorable for both the educators and the students.

4. Start Up Conclave 2025

Date: 23/09/2025 and 24/09/2025

Location: The Mahatma Mandir Convention and Exhibition Centre, Sector 13

The Department of Metallurgical Engineering at GEC Gandhinagar made a strong statement regarding its commitment to innovation and entrepreneurship by ensuring full attendance at the Startup Conclave 2025. On September 23rd and 24th, all students from the 1st, 3rd, and 5th semesters, along with faculty members, actively participated in the two-day event held in Gandhinagar. This grand conclave, which brought together over a thousand startups, innovators, and investors, offered students a critical exposure to India's dynamic startup ecosystem. Their participation provided invaluable, real-world experience, linking their academic knowledge of advanced materials and metallurgical engineering to the commercial and entrepreneurial opportunities within high-growth sectors like defense, clean energy, and deep tech.

5. Tree Plantation Drive

Date: 05/07/2025 and 10/10/2025

Location: Opposite Building no 03, GECG, sector 28

Students and faculty of metallurgy department participated in the plantation drive collaboratively organized by the Gymkhana , NSS and Eco Club. The event provided students and staff with a meaningful opportunity to contribute directly to environmental conservation, honoring Mother Earth by planting and nurturing new life on the campus grounds. This proggrame was organized by Dr. D G Sharma and Dr. D V Mahant.

6. Visit to 17th Engimach

Date: 03/12/2025 to 07/12/2025

Location: Helipad Exhibition Centre, Gandhinagar

The 17th ENGIMACH Exhibition was held from the 3rd of December to the 7th of the December, this event was attended by 5th semester students on 6th December and on 7th December students of semester 3 attended the event along the faculty members Dr. D. G. Sharma, Dr. H. H. Jadav and Dr. P. K. Nanavati. This exhibition showed off the future of manufacturing with cutting edge technology and groundbreaking innovation in varied fields such as additive manufacturing, precision tools, robotics and automation, welding and casting equipment along with many more.

STUDENT ACHIEVEMENTS

1. In recognition of outstanding academic performance, Mr. Anuj gupta (220130121001) was awarded a Certificate of Appreciation for topping the exam as a part of Independence Day Celebrations.

2. Ms. Jahnavi Ponnaganti (240133121004) was awarded a Certificate of Appreciation in recognition of outstanding academic excellence, having secured the highest marks in the semester examination.

3. In recognition of securing top marks in the examination, Mr. Yash Shinde was awarded a Certificate of Appreciation on the occasion of Independence day. As he was unable to attend the event, the certificate was received on his behalf by Tanmay Sarvade.

TECHNICAL/ INDUSTRIAL VISIT

1. Visit at "COE - Additive Manufacturing"

Location: PDEU University, Gandhinagar

Date and Time: 29/08/2025, 5:00 PM to 6:30 PM

On the 29th of November 2025, Dr. D G Sharma, Dr. H H Jadav and Dr. D V Mahant visited "COE - Additive Manufacturing", PDEU University, Gandhinagar on Friday, 29th August 2025, Time: 5:00 PM – 6:30 PM along with 40 BE students of 7th, 5th and 3rd semester, Metallurgy Department, Government Engineering College, Gandhinagar. Students given practical exposure of additive manufacturing techniques. During the visit, students received practical exposure to various additive manufacturing techniques, enabling them to understand emerging technologies and their applications in modern engineering. This visit provided valuable insight into advanced manufacturing processes and enriched the students' technical learning experience. Dr. D G Sharma coordinated this event.

TECHNICAL/ INDUSTRIAL VISIT

2. Industrial visit by 3rd semester students

Location: KPIL, sector 28, Gandhinagar

Date and Time: 28/11/2025, 2PM onwards

As part of the Semester 3 industrial exposure programme, students visited Kalpataru Projects International Limited, located in Sector 28, Gandhinagar. The visit aimed to provide practical insight into real-world manufacturing operations and enhance their understanding of industrial workflows. During the visit, students observed a range of advanced fabrication and processing technologies, including plasma blade CNC cutting, drilling, punching, bending, metal heating, and galvanizing. They also witnessed welding processes such as Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW). The visit offered valuable hands -on exposure to modern industrial practices and strengthened the students' understanding of production techniques used in large-scale manufacturing.

MOUs WITH INDUSTRY PARTNERS

GEC Gandhinagar Signed MoUs with Five Industry Partners

Date: 25/09/2025

Location: Government Engineering College, Gandhinagar

A Memorandum of Understanding (MoU) was signed between Government Engineering College, Sector-28, Gandhinagar, and five esteemed organizations: GTU ITR (5 years), IIF Ahmedabad Chapter (5 years), TDC Alloys (5 years), ISNT Ahmedabad Chapter (10 years), Aditya High Vacuum Pvt. Ltd. (10 years). These strategic partnerships aim to enhance industrial exposure, support internships and training, facilitate expert talks and workshops, and promote innovation and startup activities for students and faculty.


ULTRA TECH

MEMORANDUM OF UNDERSTANDING (MoU)

(Strategic Partnership)

This Memorandum of Understanding is made on (Date: 25-09-2025) at Gandhinagar between

Government Engineering College, Sector 28, Gandhinagar

and

Ultra Tech, Ahmedabad (Second party)

Government Engineering College (GEC), Sector-28, Gandhinagar and Ultra Tech, Ahmedabad wishes to forge Strategic Partnership to achieve following partnership objectives.

- To establish close and continuing interaction to improve industrial exposure to faculties and students of GEC, Gandhinagar.
- To help students to identify real life challenges faced by the industries.
- To arrange expert talk/seminar/workshops with help of engineers from the second party and faculties from GEC, Gandhinagar.
- To have summer internship/Final year internship /industrial visit for the students.
- To have industrial training for faculties.
- To support innovation and start-up activities in the GEC, Gandhinagar.

Both the parties recognize that this MoU establishes a foundation of mutual understanding and interest and does not itself entail any financial obligation for either party.

This MOU shall become valid for the period of ten years with understanding that the agreement may be cancelled by either party at any time.

Date:

For and on Behalf of
Government Engineering College
Sector 28, Gandhinagar

For and on Behalf of
Shri YATIN D RAVAL
Ultra Tech
411, 4th floor, Devraj Mall, Opp. Haveli
Mandir, Iscla colony road, Bopnagar,
Ahmedabad - 382418, Gujarat, India.


MEMORANDUM OF UNDERSTANDING (MoU)

(Strategic Partnership)

This Memorandum of Understanding is made on (Date: 25-09-2025) at Gandhinagar between

Government Engineering College, Sector 28, Gandhinagar

and

Aditya High Vacuum Pvt Ltd, Ahmedabad (Second party)

Government Engineering College (GEC), Sector-28, Gandhinagar and Aditya High Vacuum Pvt Ltd, Ahmedabad wishes to forge Strategic Partnership to achieve following partnership objectives.

- To establish close and continuing interaction to improve industrial exposure to faculties and students of GEC, Gandhinagar.
- To help students to identify real life challenges faced by the industries.
- To arrange expert talk/seminar/workshops with help of engineers from the second party and faculties from GEC, Gandhinagar.
- To have summer internship/Final year internship /industrial visit for the students.
- To have industrial training for faculties.
- To support innovation and start-up activities in the GEC, Gandhinagar.

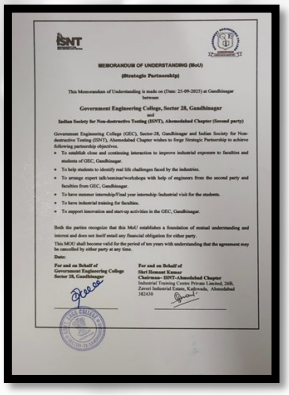
Both the parties recognize that this MoU establishes a foundation of mutual understanding and interest and does not itself entail any financial obligation for either party.

This MOU shall become valid for the period of ten years with understanding that the agreement may be cancelled by either party at any time.

Date:

For and on Behalf of
Government Engineering College
Sector 28, Gandhinagar

For and on Behalf of
Dr. Venkat N. Rasani
Managing Director
Aditya High Vacuum Pvt Ltd
218-219, Road No 2, GIDC Kathwada,
Ahmedabad 382430


ISNT

MEMORANDUM OF UNDERSTANDING (MoU)

(Strategic Partnership)

This Memorandum of Understanding is made on (Date: 25-09-2025) at Gandhinagar between

Government Engineering College, Sector 28, Gandhinagar

and

Indian Society for Non-destructive Testing (ISNT), Ahmedabad Chapter (Second party)

Government Engineering College (GEC), Sector-28, Gandhinagar and Indian Society for Non-destructive Testing (ISNT), Ahmedabad Chapter wishes to forge Strategic Partnership to achieve following partnership objectives.

- To establish close and continuing interaction to improve industrial exposure to faculties and students of GEC, Gandhinagar.
- To help students to identify real life challenges faced by the industries.
- To arrange expert talk/seminar/workshops with help of engineers from the second party and faculties from GEC, Gandhinagar.
- To have summer internship/Final year internship /industrial visit for the students.
- To have industrial training for faculties.
- To support innovation and start-up activities in the GEC, Gandhinagar.

Both the parties recognize that this MoU establishes a foundation of mutual understanding and interest and does not itself entail any financial obligation for either party.

This MOU shall become valid for the period of ten years with understanding that the agreement may be cancelled by either party at any time.

Date:

For and on Behalf of
Government Engineering College
Sector 28, Gandhinagar

For and on Behalf of
Shri Hemant Kumar
Chairman- ISNT-Ahmedabad Chapter
Industrial Training Centre Private Limited, 26B,
Zaveri Industrial Estate, Kathwada, Ahmedabad
382430

TRAINING/ACTIVITY ATTENDED BY FACULTY/STUDENTS

1. Expert session organized by ASM Gujarat Chapter

Date: 04/07/2025

Location: IIT Gandhinagar

Prof. S. I. Patel and Dr. H. H. Thakar participated in the expert session organized by the ASM Gujarat Chapter on 4 July 2025, featuring insights on Surface Engineering and Additive Manufacturing.

2. Expert session on Surface Engineering and Coating Technologies

Date: 04/07/2025

Location: Ahmedabad University (Organized by ASM Gujarat Chapter)

Dr. I. B. Dave and Dr. D. G. Sharma attended a technical session at Ahmedabad University on 4 July 2025, organized by the ASM Gujarat Chapter. The session highlighted emerging possibilities in surface engineering, including advanced biomedical coatings, self-cleaning optical materials, and efficiency-enhancing solutions for energy applications.

3. Dr. I. B. Dave Supervises Successful Ph.D. Thesis Submission on Advanced Welding Research

Date: 22/08/2025

Under the expert guidance of Dr. I. B. Dave, Ravi Dillipkumar Dave successfully submitted his Doctor of Philosophy (Ph.D.) thesis titled "Experimental Investigation on Hybrid Welding of Stainless Steel using Advanced Gas Metal Arc Welding (GMAW) Process" to Gujarat Technological University, Ahmedabad in August 2025. The research, co-supervised by Dr. Jaykumar J. Vora, marks a significant milestone in advanced metallurgical studies and highlights Dr. I. B. Dave's continued contribution to cutting-edge welding research.

4. Expert Talk Series Seminar on "Corrosion Management for Asset Integrity".

Date: 19/09/2025

Location: Ahmedabad Management Association (AMA), Vastrapur, Ahmedabad

As part of the ASM Gujarat Chapter's Expert Talk Series, the seminar on "Corrosion Management for Asset Integrity" was held on 19th September 2025 at AMA, Vastrapur. The event saw active participation from faculty members, along with attendees from industry and academia. The session was led by Prof. U. Kamachi Mudali and covered key aspects of corrosion management relevant to long-term asset performance.

5. Gujarat Chapter Seminar on Surface Hardening of Stainless Steels

Date: 03/10/2025

Location: Plenteous Inn, Opp. Gandhigram Railway Station, Ellisbridge, Ahmedabad

Dr. I. B. Dave (HoD – Metallurgy, GEC Gandhinagar), along with faculty members Dr. D. G. Sharma, Dr. H. H. Jadav, and Dr. D. V. Mahant, attended the ASM Gujarat Chapter Seminar on 3rd October 2025 at Plenteous Inn, Ahmedabad. They were joined by Dr. Yakshil Chokshi (GP Gandhinagar) and Dr. Pramod Bhingole (Dean – Outreach and Alumni Affairs, IITRAM). The session, focused on Surface Hardening of Stainless Steels, provided valuable insights into S^3P (Specialty Stainless Steel Processes) and their effects on wear resistance, corrosion resistance, and surface performance.

6. Visit to ATIRA

Date: 09/10/2025

Location: Ambawadi, Ahmedabad

Dr. D. G. Sharma visited the Ahmedabad Textile Industry's Research Association (ATIRA), Ambawadi, Ahmedabad, on 9 October, with the objective of initiating future collaborations and exploring opportunities that would contribute to the academic and research development of the department and benefit students.

7. Blood Donation at Unity Blood Centre

Date: 19/10/2025

Location: Unity Blood Centre, Emerald Business Hub, Sevashram Road, Bharuch

On 19th October 2025, Dr. I. B. Dave contributed to a blood donation drive at Unity Blood Centre, Emerald Business Hub, Sevashram Road, Bharuch.

8 IIW's 1st Foundation Day

Date: 06/12/2025

Location: Hotel Binori, Ahmedabad

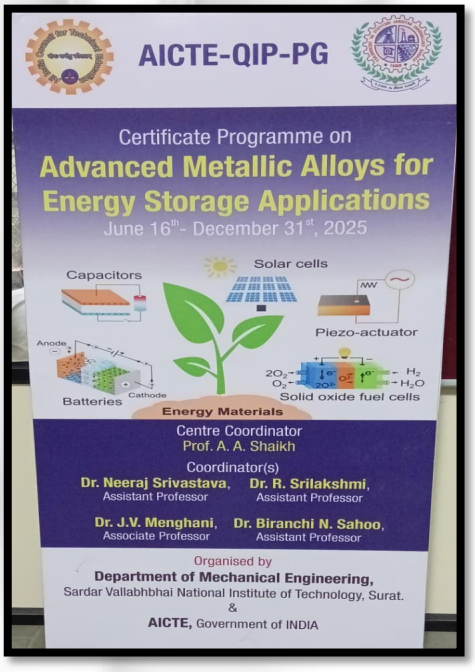
On 6th December 2025, 03 faculty members & 7 students from BE semester 3rd & 5th semester attend IIW Ahmedabad Centre 1st foundation day celebration, as a part of the celebration Dr. R. K. Varma, Scientist / Engineer ISRO- SAC, Ahmedabad delivered an expert session on "Advanced Welding for Aerospace & Space System". It was a insightful session on different advanced welding techniques, aerospace material and the challenges faced in such harsh space environment. The students participated with great enthusiasm .

9. Certificate Programme on Advanced Metallic Alloys for Energy Storage Application

Date: 10/12/2025

Location: Sardar Vallabhbhai National Institute of Technology, Surat

The SVNIT, Surat, in collaboration with AICTE, Government of India, organized an AICTE-QIP-PG Certificate Programme on "Advanced Metallic Alloys for Energy Storage Applications" from 16 June to 31 December 2025. The programme was attended by Dr. I. B. Dave, Professor and Head, Metallurgy Department. The certificate programme provided valuable academic and research-oriented exposure, enhancing participants' understanding of emerging energy storage technologies and their relevance to future engineering applications.



TRAINING/ACTIVITY ATTENDED BY FACULTY

Name of faculty	Title of Training / Activity	Duration	Organizer
Dr. I. B. Dave	Seminar on Surface Patterning of Coatings and Surfaces	04/07/2025	ASM Gujarat Chapter, Ahmedabad University
	Seminar on Surface Hardening of Stainless Steels	03/10/2025	ASM Gujarat Chapter, Ahmedabad University
	Certificate Program: Advanced Metallic Alloys for Energy Storage Application	16/06/2025 to 31/12/2025	SVNIT Surat
Dr. D. G. Sharma	Workshop on Space and Defence Applications with Advance Composite Materials (Gujarati)	07/10/2025 to 09/10/2025	AICTE (VAANI), L.D. College of Engineering
	Seminar on Surface Patterning of Coatings and Surfaces	04/07/2025	ASM Gujarat Chapter
	Webinar on Cyber Drill – Phishing, Malware & Ransomware	07/07/2025	CAWACH Kendra, Govt. of Gujarat
	Webinar on Mental Health Importance in Education System	21/11/2025	Knowledge Consortium of Gujarat
	Webinar on Cyber Security & Awareness	20/09/2025	Knowledge Consortium of Gujarat
	MAT-TALK on Automation and Digitalization in Automotive Industry	29/08/2025	ASM Gujarat, PDEU Gandhinagar
	Seminar on Corrosion Management for Asset Integrity	19/09/2025	ASM Gujarat Chapter
	Seminar on Surface Hardening of Stainless Steels	03/10/2025	ASM Gujarat Chapter
	Expert Talk on Advanced Welding for Aerospace & Space System	06/12/2025	IIW Ahmedabad Centre
Dr. H. H. Jadav	Seminar on Corrosion Management for Asset Integrity	19/09/2025	ASM Gujarat Chapter
	Expert Talk on Advanced Welding for Aerospace & Space System	06/12/2025	IIW Ahmedabad Centre
	Seminar on Surface Hardening of Stainless Steels	03/10/2025	ASM Gujarat Chapter
Prof. S. I. Patel	ASM Expert Talk on Surface Engineering and Additive Manufacturing	04/07/2025	ASM Gujarat Chapter & NAMTECH IIT Gandhinagar

TRAINING/ACTIVITY ATTENDED BY FACULTY

Name of faculty	Title of Training / Activity	Duration	Organizer
Dr. P. K. Nanavati	Expert Talk on Advanced Welding for Aerospace & Space System	06/12/2025	IIW Ahmedabad Centre
	FDP: Joining Technologies for Metals	July–October 2025	NPTEL
Dr. D. V. Mahant	Seminar on Surface Hardening of Stainless Steels	03/10/2025	ASM Gujarat Chapter
Dr. H. H. Thakar	ASM Expert Talk on Surface Engineering and Additive Manufacturing	04/07/2025	ASM Gujarat Chapter & NAMTECH IIT Gandhinagar
	Webinar on The Science Behind Monsoon – How it Affects our Lives	18/07/2025	Knowledge Consortium of Gujarat
	IP Awareness / Training Program	30/07/2025	Intellectual Property Office, India
Prof. R. C. Ghanghas	FDP: Joining Technologies for Metals	July–October 2025	NPTEL
	FDP: Aluminium Based Alloys and MMCs	July–October 2025	NPTEL
	FDP: AI & ML in Material Engineering	July–October 2025	NPTEL
	Seminar on Corrosion Management for Asset Integrity	19/09/2025	ASM Gujarat Chapter

RESEARCH ACTIVITIES

Research Paper Counter (jan 2019 onwards)	Previously published	Addition	Total
	64	5	69

Sr. No.	Title of the paper	Authors	Publication
1	Investigating the employability of purging free technique for welding dissimilar austenitic stainless steel using RMD and FCAW processes	Ravi Dave, Indravadan B. Dave, Jay J. Vora, Rakesh Chaudhari, Subhash Das	Welding International Taylor and Francis
2	An investigation into friction stir surfacing of AA 6061-T6 Alloy on Low-Carbon Steel Microstructural and Mechanical Analysis	Kedar Hiteshkumar Badheka, Daulat Kumar Sharma, Vishvesh Badheka	SAE International Journal of Materials and Manufacturing
3	Exploring modern welding techniques: spotlight on friction surfacing using particle-reinforced consumables	Ankit Kumar Shah, Daulat Kumar Sharma, Krunal Mehta, Vishvesh Badheka	Materials and Manufacturing Processes, Taylor and Francis
4	Performance Evaluation of Machining Parameters in Turning Operations of 17-4 PH Steel Using Hybrid ANN-GA and Nano Cutting Fluids	Vivek John, Vinny John, Nitin Kumar, Hemenkumar H Thakar, Abhijit Bhowmik, Ajay Kumar, Kaushal Kumar, and Jeewan Singh	Journal of Materials Engineering & Performance, Springer Nature

Sr.no	Title of Patent	Name of the Faculty	Patent no/Publisher
1	Friction Stir Cladding (FSC) on substrate prepared with different knurled profiles.	Dr. Vishvesh j. Badheka, Dr. Krunal Mehta, Mr. Kedar Hiteshkumar Badheka, Dr. Daulat kumar sharma	Patent Application Publication, Journal No. 49/2025 Dated 05/12/2025 Page No.120773, Application No. 202521044151 A

Sr.no	Title of Book/Book Chapter	Name of the Faculty	Publisher
1	Chapter No. 6: Practical Aspects in Welding of Inconel/Inconel Alloys to the book “Practical Aspects of Industrial Welding Processes”	Dr. P. K. Nanavati	CRC Press, an imprint of the Taylor & Francis Group

Sr.no	Title of article	Name of the Faculty	Conference
1	Microstructure and Electrochemical Behaviour of Zn based Phase Change Alloy for Thermal Energy Storage Applications	Sonam M. Patel, Naishadh P. Patel, Mandra J. Joshi, Pinkal N. Patel, Indravadan B. Dave, Jyoti V. Menghani	16th International Conference IRSD 2025

MEDIA COVERAGE

દિવ્ય ભાસ્કર અમદાવાદ 06-09-2025

ભાસ્કર વિશેષ રાજ્યના અધ્યાપકોએ મૃતક અધ્યાપકના પરિવારને મદદ કરી માનવતા મહેકાવી

શિક્ષક દિવસે મૃતક શિક્ષકના પરિવારને રૂ. 7 લાખની મદદ કરાઈ

6 માસ પહેલાં પાલનપુરના પરિવારને 12.77 લાખની મદદ કરી હતી

પાટણના અધ્યાપકની પુત્રીના અકસ્માતમાં 8 લાખની મદદ કરી

સરકારી ઇજનેરી કોલેજમાં ભૂતપૂર્વ વિદ્યાર્થી સંમેલન

સેક્ટર-૨૮ સ્થિત સરકારી ઇજનેરી કોલેજ ગાંધીનગર ખાતે અલગ અલગ વિભાગમાં ભૂતપૂર્વ વિદ્યાર્થી સંમેલનનું આયોજન કરવામાં આવ્યું. જે અંતર્ગત દરેક વિભાગના ભૂતપૂર્વ વિદ્યાર્થીઓ દ્વારા હાલ અભ્યાસ કરતા વિદ્યાર્થીઓને માર્ગદર્શન આપવામાં આવ્યું હતું. જેનો વિદ્યાર્થીઓ અને કોલેજના અધિકારી/કર્મચારી વર્ગ સાથે અંદાજિત ૫૦૦ કરતા પણ વધુ સ્ટેક હોલ્ડર્સે હળી મળીને લાભ લીધો હતો.

દિવ્ય ભાસ્કર પાટણ 13-09-2025

કતપુર ઈજનેરી કોલેજમાં વ્યાખ્યાન

પાટણ| પાટણની કતપુર સરકારી ઈજનેરી કોલેજમાં મિકેનિકલ ઈજનેરી વિભાગમાં વ્યાખ્યાન યોજાઈ હતું. આ વ્યાખ્યાન સરકારી ઈજનેરી કોલેજ ગાંધીનગરના મેટલર્જી વિભાગના વડા ડો.ઈન્દ્રવન દવેએ પ્રસ્તુત કર્યું હતું. આ વ્યાખ્યાનનો મુખ્ય ઉદ્દેશ સ્ટીલના વિવિધ પ્રકારો અને તેમાં થતા કેરફારની અસર અંગે વિદ્યાર્થીઓને જાગૃત કરીને ભવિષ્યમાં તેના ઉપયોગ પર ચર્ચા કરી હતી. કાર્યક્રમમાં મિકેનિકલ ઈજનેરી વિભાગના વડા ડો.આનંદ ધ્રુવ, આચાર્ય ડો.ભરતભાઈ શાહ તથા ડો.હિતેશ પંચાલ સહિત વિદ્યાર્થીઓ હાજર રહ્યા હતા.

TRAINING/INTERNSHIP (2 WEEKS)

Sr. No.	En. No.	Name of Student	Name of Industry/Institute
1	220130121001	Gupta Anuj Arjunbhau	i-ACE, Automobile Centre of Excellence
2	220133121013	Nihlani Prashant Khemraj	i-ACE, Automobile Centre of Excellence

The Microscope That Films the Impossible: In-Situ TEM

By Mr. Anuj Gupta (220130121001)

Abstract

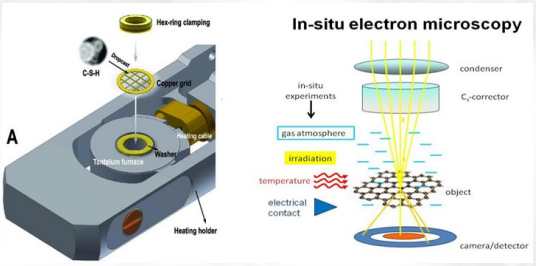
Transmission Electron Microscopy (TEM) provides highly detailed but static images. Many important processes deformation; oxidation; phase transformations are dynamic and occur rapidly. In-Situ TEM introduces heat, mechanical stress, electric fields, gases, or liquids directly inside the microscope, enabling real-time atomic-scale observation of material evolution. This technique reveals previously inaccessible mechanisms and has become a key tool in modern materials science.

Introduction

Materials constantly respond to external stimuli: metals deform under load; catalysts restructure in gases; battery materials crack during charging. Conventional TEM shows only the final state, forcing indirect interpretation. In-Situ TEM solves this by allowing controlled experiments inside the microscope while maintaining atomic resolution [1]. Real-time imaging during heating, mechanical loading, electrochemical cycling, or gas reactions provides unmatched insight into nanoscale behaviour [2].

TheTechnology Behind In-Situ TEM

Modern In-Situ TEM uses advanced MEMS chips and specialized holders capable of recreating real experimental conditions at microscale [3]. Heating chips reach 1200–1500 °C; mechanical stages apply precise nano-scale tension/ compression; biasing platforms allow current or voltage to pass through devices. Environmental cells introduce reactive gases for catalysis studies [2], while liquid cells enable observation of lithiation, SEI formation, dendrite growth, and corrosion in real time [5]. These systems provide controlled environments while the TEM records continuous high-resolution images or videos



Modes of In-Situ TEM

1. Heating In-Situ TEM: MEMS heating; melting; recrystallization; grain growth; diffusion; phase transformations.
2. Mechanical In-Situ TEM: Nano-tension/compression/bending; dislocation motion; twinning; deformation; crack initiation; fracture.
3. Electrical-Biasing TEM: Voltage/current application; electromigration; filament formation; resistive switching; structural changes.
4. Environmental (Gas) TEM: Reactive gas exposure; oxidation/reduction; catalyst restructuring; surface reactions.
5. Liquid-Cell TEM: Sealed liquid environment; lithiation; SEI growth; dendrite formation; corrosion; nanoparticle nucleation/growth.

CHALLENGES

In-Situ TEM faces limitations such as beam damage particularly in liquids [4]. Gas and liquid cells reduce resolution due to scattering [2]. Very small sample dimensions may not represent bulk behaviour. Thermal drift during heating complicates imaging, and specialized holders remain expensive. Ongoing developments in detectors, microfabrication.

CONCLUSION

In-Situ TEM transforms static imaging into dynamic, atom-by-atom observation of evolving materials. From catalysts to battery electrodes and nanomechanical processes, it reveals mechanisms that control performance and lifetime. With continual improvements in instrumentation and analytics, In-Situ TEM is set to remain essential for next generation materials research across energy, electronics, catalysis, and structural applications

REFERENCES

[1] Miao, J. C. (2017). Perspectives on in situ electron microscopy. *Ultramicroscopy*, 180, 104–111.
[2] van der Wal, L. I., Turner, S. J., & Zečević, J. (2021). In-situ TEM in catalysis research. *Catalysis Science & Technology*, 11, 3634–3658.
[3] Li, N., et al. (2025). In-situ TEM characterization of nanomaterials. *Chemical Science*, 16, 9604–9637.
[4] Cheng, Z., Wang, C., Wu, X., & Chu, J. (2022). In-situ TEM with machine learning. *Journal of Semiconductors*, 43(8), 081001.
[5] Zou, R., et al. (2017). In-situ TEM during lithiation. *Journal of Materials Chemistry A*, 5, 20072–20094.

The Hidden Attackers

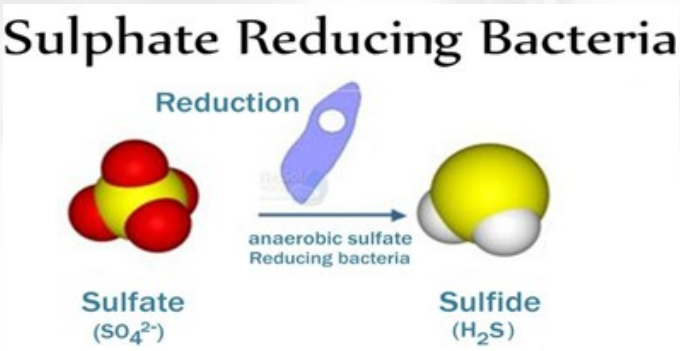
By Mr. Sunny Kasbe (240133121016)

Abstract

Metal surfaces in industries, pipelines, ships, and storage tanks often face damage that cannot be fully explained by normal corrosion. One major hidden cause is metal-eating bacteria. These microorganisms live in moist or oxygen-poor environments and slowly break down metals through chemical reactions and biofilms. This article explains how these bacteria attack metal, why they are dangerous, and how industries can protect themselves from these invisible destroyers.

Introduction

Corrosion is something we commonly associate with rust or chemical reactions, but in many cases, another silent enemy is at work—microbes. Metal-eating bacteria, also known as Microbiologically Influenced Corrosion (MIC) organisms, can speed up corrosion many times faster than normal. They survive in water, soil, oil, pipelines, and even inside storage tanks. Because they cannot be seen without special tools, they become "hidden attackers," damaging equipment, reducing safety, and causing expensive industrial failures.



How Metal-Eating Bacteria Attack and Damage Metals

Metal-eating bacteria cause corrosion through several connected actions that weaken metals from the inside out. They form sticky biofilm layers on metal surfaces, which trap chemicals and create small areas with different oxygen levels. This leads to pitting, cracking, or rapid rusting. Some bacteria release acids, hydrogen sulfide gas, or other reactive substances that directly dissolve metal. Others remove protective layers or consume iron ions as part of their energy cycle. Together, these actions create extremely aggressive corrosion that spreads quietly until the metal suddenly fails

Conclusion

Metal-eating bacteria may be invisible, but their impact is enormous. By forming biofilms and creating chemical reactions on metal surfaces, they speed up corrosion and pose a serious threat to industries worldwide. Understanding how these bacteria work is the first step toward protecting pipelines, tanks, ships, and machines from hidden attackers. With better monitoring, cleaning systems, and preventive treatments, industries can reduce the damage these microbes cause and keep metal structures stronger for longer.

References

[1]Khan, M. Saleem, Ke Yang, Zifan Liu, Lujun Zhou, Wenle Liu, Siwei Lin, Xuelin Wang, and Chengjia Shang. "Microorganisms Involved in the Biodegradation and Microbiological Corrosion of Structural Materials." Molecules 28, no. 12 (June 2023): 4668. https://doi.org/10.3390/molecules28124668

The Urban Gold Mine

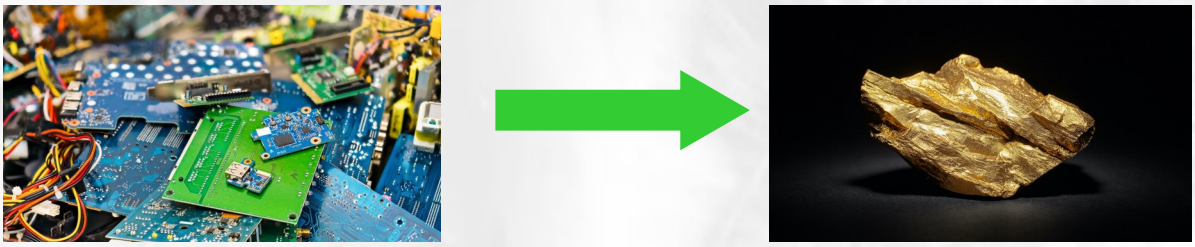
By Ms. Jahnavi Ponnaganti (240133121004)

Abstract

Electronic waste (e-waste) represents the fastest-growing solid waste stream globally and contains significant amounts of valuable metals, especially gold. With gold concentrations nearly 100 times richer than natural ores, e-waste has become a modern "urban mine". This article presents an overview of the major metallurgical approaches used for gold recovery from e-waste, including pyrometallurgy, hydrometallurgy and emerging bio-based methods. Also touches upon the challenges and future scope of sustainability in recycling the gold.[1]

Introduction

The Increasing growth of consumer electronics has resulted in millions of tonnes of discarded devices each year, emerging as a literal urban gold mine if recycled in a proper manner. Printed circuit boards (PCBs), connectors and microprocessors contain gold due to its excellent conductivity and corrosion resistance [2]. However, improper disposal leads to hazardous pollution and loss of valuable metals. Recovering gold from e-waste not only reduces waste accumulation and pollution but also provides a profitable alternative to traditional mining, making it a key area of interest in modern metallurgical research and industry [1].



Gold Recovery Methods

1. **Pyrometallurgical Processing -** Pyrometallurgy involves high-temperature smelting to separate metals from shredded e-waste. Gold partitions into molten metal phases along with copper and silver. Although this method is industrially established, the process demands high energy, expensive pollution-control systems, and produces significant slag and gaseous emissions [2].
2. **Hydrometallurgical Leaching -** Hydrometallurgy is the most widely researched approach due to its selectivity and lower energy requirements. Common leaching solutions include, Aqua regia an efficient but highly corrosive and difficult to manage, Cyanide leaching a highly selective for gold, but poses severe environmental and safety concerns and then Thiosulfate and thiourea leaching a non-cyanide alternatives, though stability and reagent cost remain challenges. Leached gold is recovered by cementation, solvent extraction or electrowinning [3].
3. **Bioleaching -** Bioleaching uses microorganisms such as Acidithiobacillus ferrooxidans to oxidize metals and facilitate gold liberation. It is energy-efficient and eco-friendly, but the rate of reaction is slow, and biological systems require controlled conditions [3].

Challenges in Gold Recovery from E-Waste

1. PCBs contain plastics, ceramics, and over 40 different elements, making selective gold recovery difficult.
2. Both pyrometallurgy and hydrometallurgy can generate hazardous by-products without proper management.
3. Collection, segregation, pre-processing, and chemical reagents add significant cost.
4. In countries like India, informal recyclers dominate, leading to unsafe practices and low metal recovery efficiency.

Conclusion: Future Scope and Trends

The future of gold recovery from e-waste is moving toward green, closed-loop metallurgical systems. Innovations include selective ionic liquids, mechanochemical leaching, automated PCB disassembly, and AI-based sorting. With better legislation, cleaner technologies and growing global interest in circular materials, e-waste truly represents an "urban gold mine" that can significantly contribute to sustainable metallurgical development.

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[3] Kaya, M. (2016). Recovery of metals and nonmetals from electronic waste by physical and chemical recycling processes. Waste Management, 57, 64–90. https://doi.org/10.1016/j.wasman.2016.08.004

ART GALLARY

PHOTOGRAPHY

By Mr. Shubham Sinha (240133121015)

By Mr. Tanmay Sarvade

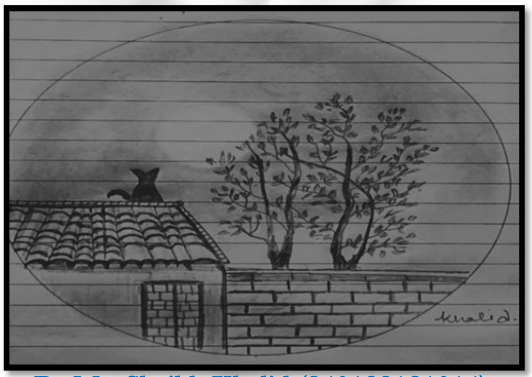
By Mr. Shaikh Khalid (240133121014)

By Mr. Om Shalunke (240133121008)

By Mr. Sunny Kasbe (240133121016)

SKETCHES

By Ms. Jahnavi Ponnaganti (240133121004)



By Mr. Shaikh Khalid (240133121014)

ART GALLERY

The tricolor, demanding attention
Fluttering and Swaying in slow motion
First the saffron, courage with passion
Then the white, peace as a notion
The Glorious Green, growth as a mission
Rolling into the future of innovation

Embracing the colors and culture
Taking along every creature
Diving head up into a new picture
Into a new era of inspiration,
Into a new era of beautiful creation,
Where world's better than our imagination

Written by Ms. Jahnavi Ponnaganti (240133121004)

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