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NEWSLETTER

METALLURGY DEPARTMENT

(NBA ACCREDITED 2023-25)

July 2022 to December 2022



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



F.No- 20-78-2013-NBA

Date: 27-04-2022

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

Subject: Accreditation status of program applied by Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.

Sir,

This has reference to your application I.D. No. 5695-15/06/2021 seeking accreditation by National Board of Accreditation to UG Engineering program offered by **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.**

2. An Expert Team conducted onsite evaluation of the program from **18th to 20th February, 2022**. 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 2022-2023 to 2024-2025 i.e. up to 30-06-2025	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 3 years. **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** should submit the Compliance Report at least six months before the expiry of validity of accreditation mentioned above so as to be eligible for consideration by the concerned Committee in NBA for further processing of the accreditation status.

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.

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

Contd./_

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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 each of the Report of Chairman of the Visiting Team and Evaluators' Report in respect of the above program is enclosed.

9. If the Institute is not satisfied with the decision of NBA, it may appeal within thirty days of receipt of this communication giving reasons for the same and by paying the requisite fee.

Yours faithfully,

(Dr. Anil Kumar Nassa)
Member Secretary

Encls.: 1. Copy of Report of Chairman of the Visiting Team.
2. Copy of Expert Report of the Visiting Team.

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.

METALLURGY

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	Prof. S. I. Patel	ME (Met. & Mat. Engg.)	Assistant Professor
3	Dr. D. G. Sharma	Ph.D (Metallurgy)	Assistant Professor
4	Dr. H. H. Jadav	Ph.D (Metallurgy)	Assistant Professor
5	Dr. P. K. Nanavati	Ph.D (Met. & Mat. Engg.)	Assistant Professor
6	Prof. D. V. Mahant	ME (Met. & Mat. Engg.)	Assistant Professor
7	Prof. B. R. Rana	ME (Met. & Mat. Engg.)	Assistant Professor
8	Prof. H. H. Thakar	ME (Met. & Mat. Engg.)	Assistant Professor
9	Prof. R. C. Ghanghas	ME (Met. & Mat. Engg.)	Assistant Professor
10	Dr. M. S. Dani	Ph.D (Metallurgy)	Assistant Professor

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ACHIEVEMENTS OF FACULTIES



Dr. I B Dave published 2 research papers in reputed journal. (Details are given in research activity).



Reviewed various activities at G3Q quiz competition organised by Govt. of Gujarat.

Dr. D G Sharma has coordinated DTE Approved DST-GUJCOST sponsored STTP- “Processing and Characterization of Materials” during September 19-23, 2022.

Dr. D G Sharma completed one week STTP on “Industrial NDT for welding and castings” organized by Metallurgy Department GEC Gandhinagar during August 1-5, 2022.



Dr. D G Sharma published 2 research papers in reputed journal. (Details are given in research activity).

Dr. D G Sharma Appointed as vice chairmen of IIM Baroda chapter.

Dr. D G Sharma reviewed various researcher manuscript of reputed journals from Taylor and Francis, Springer, MDPI etc.

Dr. D G Sharma served as Scrutiny Committee for review of R&D proposals at GUJCOST, Gandhinagar office

Dr. D G Sharma got an opportunity to personally interact with Vice President of India Shri Jagdeep Dhankhar during Excellence in Higher Education Program at GNLU, Gandhinagar on 14.10.2022

ACHIEVEMENTS OF FACULTIES



Dr. H H Jadav awarded PhD by GTU for his research in “Studies on effect of parameters of Friction Stir Welded Mg/Al alloys and characterization” on December 23, 2022.

Dr. H H Jadav has completed DTE Approved DST-GUJCOST sponsored STTP- “Processing and Characterization of Materials” during August 1-5, 2022.

Dr. H H Jadav received recognition for organizing various activities at Defense Expo 2022.

Dr. H H Jadav received recognition for organizing various activities at National Games 2022.



Dr. P K Nanavati has coordinated DTE Approved DST-GUJCOST sponsored STTP- “Industrial NDT for welding and castings” during September 19-23, 2022.

Dr P K Nanavati has completed DTE Approved DST-GUJCOST sponsored STTP- “Processing and Characterization of Materials” during August 1-5, 2022.

Dr. P K Nanavati published a research paper in reputed journal. (Details are given in research activity).



Prof. D V Mahant coordinated DTE Approved DST-GUJCOST sponsored STTP- “Processing and Characterization of Materials” during September 19-23, 2022.

Prof. D V Mahant participated in five days online FDP on “Exploring research using SEM & XRD” organised by CARE college of Engineering Trichy during December 19-23, 2022.



Prof. B R Rana successfully organised Teachers day and Engineers day events at Metallurgy Department GEC Gandhinagar.

Prof. B R Rana published a research paper in reputed journal. (Details are given in research activity).

ACHIEVEMENTS OF FACULTIES

Prof. H H Thakar completed one week online STTP on “Advanced optimization techniques for engineering and scientific applications” organized by Mechanical Department GLA University during July 15-22, 2022.

Prof. H H Thakar completed one week STTP on “Industrial NDT for welding and castings” organized by Metallurgy Department GEC Gandhinagar during August 1-5, 2022.



Prof. H H Thakar received special appreciation from National Innovation Foundation-India (DST) for reviewing grassroots innovative ideas under “Inspire - Manak Awards 2022-23”.

Prof H H Thakar successfully organised Teachers day and Engineers day events at Metallurgy Department GEC Gandhinagar.

Prof. H H Thakar got an opportunity of liaising honourable chief minister (Gujarat) Shri Bhupendrabhai Patel at G3Q conclusive summit.

Prof H H Thakar presented a paper in international conference ICRAM 2022 (details are given in research activities).

Prof. H H Thakar has coordinated Oath taking ceremony of SSMEG post bearers on July 30, 2022 and Alumni meet on Oct 1, 2022.



Prof. R C Ghanghas has successfully completed 8 week online NPTEL -MOOC course on “Nature and properties of materials—an introductory course” organised by IIT Kanpur.



Dr. Minal S Dani published a research paper in reputed journal. (Details are given in research activity).

Dr. M S Dani has coordinated Industry Institute Meet on Oct 1, 2022

EXPERT LECTURES BY FACULTIES

Sr. No	Date	Speaker	Topic	Event	Organizer
1	8/7/2022	Dr. I B Dave	Heat Treatment and its Advances	Advances in Material Processing with focus on Emerging Technologies	Nirma University
2	20/9/2022	Dr. D G Sharma	Powder manufacturing by electrolysis	One week STTP on Processing and Characterization of Materials 2022	GEC Gandhinagar-GUJCOST
3	22/9/2022	Dr. D G Sharma	Wear and microhardness testing	One week STTP on Processing and Characterization of Materials 2022	GEC Gandhinagar-GUJCOST
4	19/9/2022	Prof. D V Mahant	Non ferrous melting practices	One week STTP on Processing and Characterization of Materials 2022	GEC Gandhinagar-GUJCOST
5	22/9/2022	Prof. D V Mahant	Non destructive testing	One week STTP on Processing and Characterization of Materials 2022	GEC Gandhinagar-GUJCOST
6	2/8/2022	Prof. D V Mahant	Liquid Penetrant Testing (LPT) Method and ASME Section V	One week STTP on Industrial NDT for welding and casting	GEC Gandhinagar-GUJCOST
7	2/8/2022	Prof. D V Mahant	Magnetic Particle Testing (MPT) method and ASME Section V	One week STTP on Industrial NDT for welding and casting	GEC Gandhinagar-GUJCOST
8	4/8/2022	Prof. D V Mahant	Radiography Testing methods	One week STTP on Industrial NDT for welding and casting	GEC Gandhinagar-GUJCOST
9	29/12/2022	Prof. D V Mahant	Concept of corrosion & surface engineering	Webinar	Parul University

GLIMPSES OF EXPERT LECTURES

Sr. No	Date/Time	Speaker	Topic	Organizing Partner	Coordinator
1	22/11/2022 15:15 - 17:15	Mr. Yakshil B. Chokshi	Application of Ellingham diagram on Pyrometallurgical Processes	SSMEG	Dr. M.S. Dani
2	23/11/2022 16:00 - 17:15	Mr. Kamlesh Rana	Advances in the Hot Rolling Processes & the AI based Machine Vision system used in Hot Rolling Mills	SSMEG	Prof. S.I. Patel Dr. P.K. Nanavati Prof. B.R. Rana
3	25/11/2022 11:00– 12:30	Mr. Shubhneet Tyagi	Together Towards Tomorrow	SSMEG	Prof. R C Ghanghas
4	29/11/2022 14:45 - 16:45	Dr. Alphonasa Joseph	Corrosion Testing and Evaluation	SSMEG	Dr. D G Sharma

INDUSTRY INSTITUTE MEET

Industry-Institute meet is a very essential part of the Training, Internship and Placement activities for the Engineering students. Metallurgy Department (NBA Accredited), Government Engineering College, Gandhinagar has organized Industry-Institute meet on 1/10/2022, coordinated by Dr. Minal Dani, (Placement Coordinator), Asst. Prof. Metallurgy Department under the guidance of Dr. S.P.Dave, Principal, GEC, Gandhinagar & Dr. I.B.Dave, Professor & Head, Metallurgy Department.

In this meet, the delegates from various Professional bodies like IIF Ahmedabad Chapter, IIM Baroda Chapter, IIW Baroda, ASM Gujarat chapter & various Industries from all over Gujarat have actively participated in this meet.

The motive behind this meet was to bridge-up the gap of expectations from Industry & Academia both; vice-versa, to better help in industrial-internship with stipend program as per model AICTE -GTU Curriculum. And to provide a “Learning with earning “opportunity to the students to prepare him/ her for the industry-ready skill sets.



STTP ORGANIZED AT METALLURGY DEPT.

DTE approved and GUJCOST sponsored one week Short Term Training Program (STTP) on **Industrial Non Destructive Testing (NDT)** was held by GEC, Gandhinagar commencing from 01/08/2022 till 05/08/2022. The program was inaugurated by Prof. P.K. Nanavati followed by kind words from Principal ma'am Dr. S.P. Dave and Head of Metallurgy Department, Dr. I.B. Dave and

The STTP was attended by faculty of GEC Gandhinagar and other universities, industrialists and students of GEC Gandhinagar and expert lectures were given by notable names such as Dr. V. J. Badheka, Dr. V.B. Patel, Dr. Jaykumar Vora, Mr. Ashish Patel, Mr. Krutik Shah, Dr. Subhash Das as well as by GEC, Gandhinagar faculty member, Prof. D.V. Mahant.

Apart from expert lectures, the participants also got in-hand experience of NDT techniques in the NDT Laboratory present in GEC Gandhinagar and upon invitation by Dr. V. J. Badekha, the participants had a visit of PDEU Mechanical Department Workshop and also saw their Additive Manufacturing laboratory handled by Mr. Kshitij Acharya.

On 5th August 2022, the STTP came to an end with Valedictory function held by invited Chief Guest Dr. G.H. Upadhyay. This program was coordinated by Dr. P K Nanavati and Prof. D A Patel.



STTP ORGANIZED AT METALLURGY DEPT.

The Metallurgy Department (NBA Accredited), Government Engineering College, Sector 28, Gandhinagar had organized GUJCOST sponsored DTE-approved One Week Short Term Training Program on **"Processing and Characterization of Materials (PCM 2022)"** from 19th -23rd September 2022.

The motivation behind organizing the STTP was to share the knowledge of the processing of materials and their characterization and aware the engineers about the importance of processing in the 21st century to succeed "Make in India" concept. Green technology which is an emerging trend to manufacture the material in the final product with higher accuracy and literacy of the emerging field helpful to engineers.

Dr. G. H. Upadhyay, Principal, Mahatma Gandhi Institute of Technical Education and Research Centre, Navsari, was invited as Chief Guest for the inauguration ceremony.

The STTP was not only limited to theory but also hands-on sessions on Casting, non-destructive testing, Powder production, friction stir welding, and processing, ultrasonic welding, resistance spot welding, additive manufacturing, 3D printing, plasma cutting, potentiodynamic polarization, salt spray, SEM, XRD, TEM, tribology - Pin on disc and micro-hardness testing at Metallurgy Dept., PDEU, and IPR, Gandhinagar.

The experts invited from PDPU, IPR, NITK Surathkal, IIT-Gn, Nirma University, and MGITER shared useful and knowledgeable content. A total of 28 participants from various Government Diploma and Engineering colleges and the industrial participant participated in this STTP.

On the last day of the valedictory ceremony, Dr. Mangal Bhatt, Principal, Shantilal Shah College of Engineering, Bhavnagar was invited as Chief Guest. He has appreciated such type of program and encouraged participants to update their knowledge in the emerging field.

This program was coordinated by Dr. D G Sharma and Prof. D V Mahant. The overall feedback from the participants for the STTP was encouraging and very good in terms of content, experts, duration of STTP, Coordination of coordinators, time management, etc.



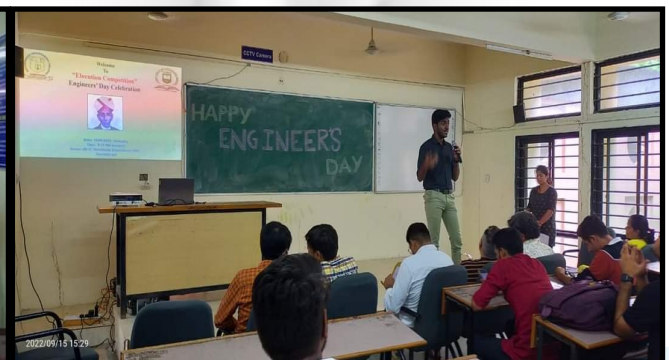
TEACHERS' DAY CELEBRATION

Teacher's day was celebrated by metallurgy department, GEC Gandhinagar in association with SSMEG on 5/9/2022 from 4:00 pm onwards. More than 48 current students have joined the event. Event started with speech by Chirayu Pande, Saurabh Newra and anchored by Nihar Huprikar. Prof. S I Patel shared a motivating speech on the auspicious day. All the faculties have shared their feeling and wished all the students. Program was concluded at 6 pm.



ENGINEERS DAY 2022

The Metallurgy Department (NBA Accredited), Government Engineering College, Sector 28, Gandhinagar and Student Society of Metallurgy Engineering Gandhinagar (SSMEG) had jointly organized the Elocution competition on the occasion of Engineers' Day 2022, in remembrance of Dr M. Visvesvaraya, on 15/09/2022, Thursday. Total 11 participants from pre final year and final year students took part in this competition. Prof. B. R.Rana and Prof. H. H .Thakar had coordinated the event under the guidance of Dr.(Prof) I. B. Dave, Head , Metallurgy Department, GEC, Gandhinagar. The event was organized with aim of development of skill set like Communication skill, time management, content development, and build up the confidence level in students.



GLIMPSES OF “ALUMNI MEET OCTOBER 2022”

The Department of Metallurgy Engineering have organized an expert talk by Alumni in this meeting for all current batches and pass out students on 1st October 2022 on MS Teams starting at 10:30 am as well as an offline expert talk was conducted. The meeting started with welcome introduction by Metallurgy Department alumni coordinator Prof. H H Thakar followed by series of two expert sessions by Alumni of the department. The event was enjoyable and simultaneously profitable in terms of providing career as well as technical guidance to the current enrolled students.

Alumni Experts and faculty members have shared the memories, Faculty members from Metallurgy Engineering have participated in this event. At the end, Prof. H H Thakar ,sincerely expressed vote of thanks to honorable Principal Madam , Dr. I B Dave sir Head of Metallurgy Department for their guidance and support to make this event a grand success and thanks to Nihar Hprikar (Sem 5) for background support, all Faculties, students ,Staff Members of metallurgy Engineering department and Alumni for attending Alumni Meet.

Sr. No.	Time	Expert Details	Topic
1	10:30 am to 12:00 pm	Mr. Asif Mansuri Jt. MD. Honest Metal Cast Pvt. Ltd.	Process Management Tools in Manufacturing Industries
2	12:00 pm to 01:30 pm	Mr. Arunsinh Zala Post Doc. Fellow at FCIPT IPR Gandhinagar	Life beyond Metallurgy: Learnings and Experiences

After the completion of the expert lectures, break was announced from 13:00 till 16:00 followed by Navratri Garba celebration by current students of Metallurgical Department, alumni, professors and office bearers, on the campus ground. The festival was celebrated wholeheartedly by the participants and was a remarkable opportunity for current students to interact with alumni and rejoice together.



VOCATIONAL TRAINING AT CSIR-CGCRI

10 students of Metallurgy department, 5th semester, attended Vocational Training Programme at CSIR Central Glass and Ceramic Research Institute, Naroda Centre, Ahmedabad from 10-14 October 2022 on “The manufacturing process of Ceramic tiles“. The five day training programme which was sponsored by Gujarat Knowledge Society, Directorate of Technical Education, Gandhinagar and under the IMPACT scheme of Government of Gujarat was one of it's first training programme conducted by CSIR laboratories. The programme being held at the heart of Gujarat was bustling with many planned training schedules .



GUIDENCE FOR ME WELDING TECH COURSE BY L&T

Metallurgy department GEC Gandhinagar has organised an awareness session for Masters in Welding Technology course. ME Welding Technology is a course having ample opportunities for sponsorship from Larsen and Toubro Ltd. And other reputed heavy engineering industries. Mr Ritesh Patel (MD welding and Metallurgy, HED L&T Hazira) and Mr. Karan Modi (Sr. Welding Engineer, HED L&T Hazira) have addressed current students of 7th and 5th semester. Guidance regarding admission process, course and future scope was presented in detail by L&T officials in favour of students.



STUDENT ACTIVITIES

Interaction of Minister (Fisheries and Dairy) with students under the programme I-Hub took place at KCG (Knowledge Consortium of Gujarat) Ahmedabad dated 7-10-22 was accompanied with Prof. H H Thakar, along with Semester 2nd students. The students who are newly admitted D2D got an exposure to meet and interact with Government Officials.



The GTU new campus (KHAT Muhurat) at Lekawada, Gandhinagar was organised by Government Technical University, Ahmedabad on 27-09-22 was participated by students of semester 5th and 7th accompanied by Prof. Bhavesh Rana.



The Inauguration of SSIP 2.0 Policy at Shri Shakti Invention Centre was organised at Ahmedabad on 17-9-22 was participated by the students of semester 7th accompanied by Prof. Sunil Patel and Dr. H H Jadav.

The Commerce and Industries Ministers and Interaction was organised by KCG (Knowledge Consortium of Gujarat) Ahmedabad dated 8-10-22 by the students of Government Engineering College Gandhinagar -28 of semester 7th under the guidance of Prof. Sunil Patel and Dr. H H Jadav.



The NDE 2022 Seminar based on Careers in NDT was organised by National Non Destructive academy was visited by students of Semester 3rd and 5th accompanied by Prof. Devankumar Mahant and Dr. Purvesh Nanavati on 25-11-22.

STUDENT ACTIVITIES

The Metro Workshop visit was attended by Semester 7th students coordinated and accompanied by Prof. Sunil Patel dated 8-10-22.



National Games held at Mahatma Mandir, Gandhinagar was organized on 01-10-22 by Government Of Gujarat in which students of GEC Gandhinagar -28 visited the facility to celebrate the event. The event was accompanied by the Dr. H H Jadav.



Poster presentation competition at INDUS was organized on 5-8-2022 by INDUS University in which students of GEC Gandhinagar participated enthusiastically accompanied by Prof. S I Patel. The students learnt about various experimentations, recent developments in Metallurgy and Materials Department.



Respect Food program, Paldi was organized by Climate Change Department at Tagore Hall dated 7-10-22. Students of GEC Gandhinagar -28 participated with enthusiasm and were accompanied by Prof. S I Patel.



STUDENT ACTIVITIES

Tree plantation was carried out by Metallurgy department GEC Gandhinagar on 25/7/2022 9:00 AM onwards. Faculty of Metallurgy department along with the 7th and 5th semester students planted various saplings within the campus. Dr. D G Sharma coordinated this event.



OATH TAKING CEREMONY

Students of Metallurgy Dept. GEC Gandhinagar, office bearers and members of Students' Society of Metallurgy Engineering Gandhinagar celebrated oath taking ceremony new office bearers on 30/7/2022 11 AM onwards. Felicitation of past SSMEG office bearers and faculty members of the Metallurgy Dept. was organised under the guidance of president, SSMEG. Being guest of honour, Dr. G H Upadhyay has shower the blessings and congratulated the new SSMEG post bearers. 40 students of 5th and 7th semester has attended the ceremony who has been motivated to actively participate in various activities with an intention to strengthen the association. Program was concluded followed by light refreshments for students and guests.

Prof. H.H. Thakar suggested to form a student body who can actively work for various SSMEG activities. Dr. G H Upadhyay donated Rs. 5000 and Dr. I B Dave donated Rs. 1000 to SSMEG with their best wishes



RESEARCH ACTIVITIES

Research Paper counter (Jan 2019 onwards)	Previously published	Addition	Total
	39	6	45

Sr. No.	Title	Authors	Publication
1	“Modelling on CVN Toughness of Weld Deposits”	<i>Rudrang Chauhan, Purvesh Nanavati, Vinaykumar Pandit & Shashank Sharma</i>	Jurnal Kejuruteraan
2	“A Review on Galvanizing Coating Defects: Causes and Remedies “	Jayraj Parmar, Daulat Kumar Sharma, Patel Khyati & Patel Sweta	Jurnal Kejuruteraan
3	“Effect of Various Fluxes on Different Metals and Alloys in A-TIG Process: A Review”	Rudrang Chauhan, Daulat Kumar Sharma, Bhavesh Rana, Jemish Bhayani & Meet Borad	Jurnal Kejuruteraan
4	“Improving Performance of Al-Mg Anode Through Forging”	Vidhi A Mistry* Dr. Minal S Dani Dr. Indravadan B Dave	Journal of Basic Sciences Vol 22 issue 12 Dec 2022
5	“Study of Thermal Spray Coating Characterization and Corrosion with Arc And Flame Spray Process for Oil and Gas	Urvesh Vala Dr. Indravadan B Dave	CORCON 2022, Udaipur, India

Sr. No.	Title	Authors	Conference	Organizer
1	“Importance of high strength steels and their welding in petrochemical industries”	Hemen H Thakar, Mrunalkumar D Chaudhari, Jay J. Vora	International Conference on Recent Advances in Manufacturing industries- 2022	IIT Bhilai, IITRAM Ahmedabad

CERTIFICATION EARNED BY FACULTY MEMBERS

Sr. No.	Name of the Faculty	Title of Training/Activity	Duration	Organizer
1	Dr. D G Sharma	Participated & successfully completed GUJCOST-DST Sponsored, DTE Approved One Week STTP on "Industrial NDT for Welding and casting"	1/8/2022-5/8/2022	Metallurgy Department, Government Engineering College, Sector-28, Gandhinagar.
2	Dr. H H Jadav	Participated in GUJCOST-DST sponsored DTE approved One Week STTP on "PROCESSING AND CHARACTERIZATION OF MATERIALS (PCM2022)"	19/9/2022-23/9/2022	Metallurgy Department, Government Engineering College, Sector-28, Gandhinagar.
		Recognition of Excellent Involvement and professionalism exhibited at India's Largest Defence Exhibition DefExpo 2022	18/10/2022-22/10/2022	DefExpo 2022, Govt. of India
3	Dr. P K Nanavati	Participated in GUJCOST-DST sponsored DTE approved One Week STTP on "PROCESSING AND CHARACTERIZATION OF MATERIALS (PCM2022)"	19/9/2022-23/9/2022	Metallurgy Department, Government Engineering College, Sector-28, Gandhinagar.
4	Prof. H H Thakar	successfully completed Job oriented Valve Added Course on the topic Advanced Optimization Techniques for Engineering and Scientific Applications (AOTESA-2022)	15/7/2022-22/7/2022	Department of Mechanical Engineering at GLA University
		Successfully completed GUJCOST-DST Sponsored, DTE Approved One Week STTP on "Industrial NDT for Welding and casting"	1/8/2022-5/8/2022	Metallurgy Department, Government Engineering College, Sector-28, Gandhinagar.
		Served as reviewer of innovative ideas/innovations received under the INSPIRE Awards-MANAK for the year 2022-23	21/11/2022	National Innovation Foundation- India
5	Prof. R C Ghanghas	successfully completing the course Nature and Properties of Materials - an Introductory Course with a consolidated score of 65%	July-Sept 2022	NPTTEL-AICTE

CERTIFICATION EARNED BY STUDENTS

Sr. No.	Name of the Student	Title of Training/Activity	Duration	Organizer
1	Diya Churakkate	CERTIFICATE OF APPRECIATION- securing highest SPI (8.92) B.E. (METALLURGY) in semester 5 during Academic Year 2021-2022.	15/8/2022	Metallurgy Department, GEC Gn
2	Prashant Khedkar	CERTIFICATE OF APPRECIATION- securing highest SPI (8.63) B.E. (METALLURGY) in semester 7 during Academic Year 2021-2022.	15/8/2022	Metallurgy Department, GEC Gn
3	Bhavsar Gunjit	CERTIFICATE OF APPRECIATION- securing highest SPI (7.74) B.E. (METALLURGY) in semester 3 during Academic Year 2021-2022.	15/8/2022	Metallurgy Department, GEC Gn
4	Jay Bhanderi	CERTIFICATE OF PARTICIPATION- recognition of your Excellent Involvement and professionalism exhibited at India's Largest Defence Exhibition DefExpo 2022.	18/10/2022-22/10/2022	DefExpo 2022, Govt. of India
5	Nisrg Barad	CERTIFICATE OF PARTICIPATION- recognition of your Excellent Involvement and professionalism exhibited at India's Largest Defence Exhibition DefExpo 2022.	18/10/2022-22/10/2022	DefExpo 2022, Govt. of India
6	Viraj Pithava	CERTIFICATE OF PARTICIPATION- recognition of your Excellent Involvement and professionalism exhibited at India's Largest Defence Exhibition DefExpo 2022.	18/10/2022-22/10/2022	DefExpo 2022, Govt. of India
7	Jaymil Khunt	CERTIFICATE OF PARTICIPATION- recognition of your Excellent Involvement and professionalism exhibited at India's Largest Defence Exhibition DefExpo 2022.	18/10/2022-22/10/2022	DefExpo 2022, Govt. of India
8	Nihar Ravindra Huprikar	Certificate of Winner This is to certify that Mr/Miss. Nihar Huprikar of Semester 5 Enrolment No 200130121004 reserved 1st rank in "Elocution competition"	15/09/2022	Metallurgy Department, GEC Gn & SSMEG
9	Chirayu Vilas Pande	Certificate of Winner This is to certify that Mr/Miss. Chirayu Vilas of Semester 5 Enrolment No 200130121004 reserved 2nd rank in "Elocution competition"	15/09/2022	Metallurgy Department, GEC Gn & SSMEG
10	Madhu Kumari	Certificate of Winner This is to certify that Mr/Miss. Madhu Kumari of Semester 7 Enrolment No 190130121012 reserved 3rd rank in "Elocution competition"	15/09/2022	Metallurgy Department, GEC Gn & SSMEG

MEDIA COVERAGE

મેટલર્જી વિભાગ (NBA Accredited) સરકારી ઈજનેરી કોલેજ ખાતે યોજનાર સામાજિક પ્રોગ્રામ “ Industrial NDT for welding and Castings”



ગાંધીનગર, તા.૫ મેટલર્જી વિભાગ, સરકારી ઈજનેરી કોલેજ, સેક્ટર-૨૮, ગાંધીનગર ખાતે ડિરેક્ટર ઓફ ટેકનિકલ એજુકેશન દ્વારા મંજૂર અને ગુજકોસ્ટ પ્રાયોજિત “ Industrial NDT for welding and Castings” નો શુભારંભ આજરોજ તારીખ ૦૧ ઓગષ્ટ, ૨૦૨૨ યોજાયેલ. કાર્યક્રમમાં સંસ્થાના આચાર્ય ડૉ. એસ. પી. દવેએ વિવિધ ઈજનેરી શાખામાં NDTનું મહત્વ સમજાવેલ. ડૉ. આઈ. બી. દવેએ કાર્યક્રમની રૂપરેખા આપી અને વિભાગની વિવિધ પ્રવૃત્તિની માહિતી આપી હતી. કાર્યક્રમના મુખ્ય અતિથિ તરીકે ડૉ. વી.જે.બપેકા, ખાતાના વડા, મેકેનિકલ ઈજનેરી વિભાગ, પીટીઈયુ, ગાંધીનગર તથા અતિથિ વિશેષ તરીકે ડૉ. વી. બી. પટેલ, ખાતાના વડા, મેકેનિકલ ઈજનેરી વિભાગ, એલડીસીઈ, અમદાવાદ એ ઉપસ્થિત રહી સ્વયં સમયમાં NDTની ઔદ્યોગિક જરૂરિયાત વિષે માહિતી આપી હતી. આ તાલીમ કાર્યક્રમ કોવીડ મહામારી બાદ પ્રથમ વાર પ્રત્યક્ષ રીતે તારીખ ૦૧ થી ૦૫ ઓગષ્ટ, ૨૦૨૨ દરમિયાન યોજનાર સ.ઈ.કો ગાંધીનગર ખાતે યોજનાર છે અને તેમાં બિયડી તેમજ પ્રેક્ટીકલ ના સરો રાખવામાં આવેલ છે. આ તાલીમના સંયોજક મેટલર્જી વિભાગના પ્રો. પી.કે.નાણાવટી અને પ્રો. ડી.એ.પટેલ ના જણાવ્યા પ્રમાણે આ પ્રોગ્રામમાં મેટલર્જી

ઈજનેરીના વિવિધ વિષયોનું તજજ્ઞો દ્વારા વિશ્લેષણ અને માર્ગદર્શન આપવામાં આવશે. ઉપરોક્ત સામાજિક પ્રોગ્રામ હેઠળ ગુજરાતની ના વિવિધ ઈજનેરી વિદ્યાશાખાના ૫૦ તાલીમાર્થી જોડાયેલ છે.

એ.વી.વી. ઈન્ડિયા સ્કુલમાં મોનર



સરકારી ઈજનેરી કોલેજના દસ વિદ્યાર્થીઓએ ઔદ્યોગિક તાલીમ મેળવી



ગાંધીનગર, તા.૧૭ સરકારી ડિગ્રી ઈજનેરી કોલેજમાં અભ્યાસ કરતાં વિદ્યાર્થીઓને તેઓ જે વિદ્યાશાખામાં અભ્યાસ કરે છે, તે જ વિદ્યાશાખાને લગતી ટેકનિકલ વિષયની તાલીમ ક્ષેત્રમાં મેળવે અને તેમની કૌશલ્ય ક્ષમતામાં વધારો થાય તે હેતુથી, IMPACT યોજના હેઠળ મેટલર્જી ઈજનેરી વિભાગ, સરકારી ઈજનેરી કોલેજ સેક્ટર ૨૮, ગાંધીનગરના ૧૦

વિદ્યાર્થીઓએ CSIR - CGCRI, અમદાવાદ ખાતે પાંચ દિવસીય ઈંડસ્ટ્રિયલ તાલીમ મેળવી, જેમાં તેમણે સિરામિક ટાઇલ્સ મેનુફેક્ચરિંગ અંગેની તાલીમ આપવામાં આવી હતી. તાલીમ અંગેનો ખર્ચ પ્રતિ વિદ્યાર્થી લેખે ૧૧,૮૦૦/- પ્રમાણે ૧,૧૮,૦૦૦/- ફીની રકમ Gujarat Knowledge Society (GKS), ડીટીઈ, ગાંધીનગર દ્વારા ચુકવવામાં આવેલ હતી.

સરકારી ઈજનેરી કોલેજ ગાંધીનગર ખાતે Industry-Institute Meetનું આયોજન



ઉચ્ચ શિક્ષણના તાબા હેઠળના મેટલર્જી વિભાગ, સરકારી ઈજનેરી કોલેજ, સેક્ટર-૨૮, ગાંધીનગર ખાતે Industry-Institute Meet નું આયોજન કરેલ હતું. જેમાં ગુજરાત રાજ્યની વિવિધ પ્રોફેશનલ બોર્ડી જેવીકે આઈઆઈએક અમદાવાદ ચેપ્ટર, આઈઆઈએમ બરોડા ચેપ્ટર, એએસએમ ગુજરાત ચેપ્ટર, ગૌતમ ઉપાધ્યાય, ચેરમેન, બીએએસ, મેટલર્જી, જીટીયુ, ડૉ. વિશ્વેશ બપેકા (હેડ, મેકેનિકલ ડીપાર્ટમેન્ટ પીટીઈયુ ગાંધીનગર) અને ઈન્ડસ્ટ્રીજ જેવી કે એલ એન્ડ ઈ યીચોડા લી., ભગવતી પ્રાઈ.લિ., યુનિટેક મેટાલીયુજીકલ સર્વીસીસ, ટીડીસી એલોયક, ગલ્ફ એનડીઈ સર્વિસીસ લિ., કીપશેક ઈન્ડ્ર., દેવશ્રી એલ્યુમીનીયમ પ્રા.લિ.,

હોનેસ્ટ મેટલ કાસ્ટ, થર્મોટ્રોનિકસ પ્રા.લિ., સિધ્ધી એન્જનીયરીંગ પ્રા.લિ., ઈએસએબી ઈન્ડિયા પ્રા.લિ. તથા એન.કે.વેક્યુમ હીટ ટ્રીટમેન્ટના પ્રતિનીધીઓ આ મીટમાં ઉપસ્થિત રહ્યા હતા. આ કાર્યક્રમનું આયોજન, ડૉ. સ્વેતા. પી. દવે આચાર્ય સરકારી ઈજનેરી કોલેજ ગાંધીનગર, ડૉ. આઈ. બી. દવે મેટલર્જી વિભાગના વડાના સયુક્ત માર્ગદર્શન હેઠળ મેટલર્જી વિભાગના પ્રાધ્યાપકો ડૉ. પી. કે. નાનાવટી અને ડૉ. મીનલ દાણીએ પ્લેસમેન્ટ કોઓર્ડિનેટર કર્યું હતું, જેનો મુખ્ય હેતુ ઈન્ડસ્ટ્રી અને પ્રોફેશનલ બોર્ડીને જીટીયુ અમદાવાદના એઆઈસીટીઈ મોડેલ અભ્યાસક્રમથી માહિતિગાર કરવાનો અને વિદ્યાર્થીઓને અંતિમ સેમેસ્ટરમાં ઈન્ટર્નશીપ વીચ

સ્ટીપેન્ડનું આયોજન કરવાનો હતો. ઉપરોક્ત મિટિંગમાં વિદ્યાર્થીઓના મેટલર્જી અભ્યાસક્રમ પ્રત્યે ઘટની રુચિ માટે કથા પગલાં લઈ શકાય એ બાબતે વિસ્તૃત ચર્ચા થઈ હતી. ડૉ. પી. એન ભગવતીએ હાજર રહી પોતાના બહોળા અનુભવનો લાભ વિદ્યાર્થીઓ સુધી પહોંચે તે નેતૃત્વ અને કૌશલ્ય વિકાસ, કામના વાતાવરણ માટે લાગણી મેળવવી, વિદ્યાર્થીઓનો આત્મવિશ્વાસ વધારવો અને કાર્યસ્થળનું અવલોકન છે. ઈન્ટર્નશિપ વિષય સ્ટાઈપેન્ડ વિષય સ્ટાઈપેન્ડ સાથે કારકિર્દી સંશોધન, નેટવર્કિંગ, નેટવર્ક અને કૌશલ્ય વિકાસ, કામના વાતાવરણ માટે લાગણી મેળવવી, વિદ્યાર્થીઓનો આત્મવિશ્વાસ વધારવો અને કાર્યસ્થળનું અવલોકન છે. ઈન્ટર્નશિપ વિષય સ્ટાઈપેન્ડ, ઈન્ટર્ન અને એમ્પ્લોયર વચ્ચે બોન્ડ બનાવવા જે એમ્પ્લોયરની અપેક્ષાઓ ચોક્કસપણે પૂરી કરશે.

સરકારી ઈજનેરી કોલેજ ખાતે પ્રોસેસિંગ એન્ડ કેરેક્ટરાઈઝેશન-૨૦૨૨નું ઉદઘાટન



ઉચ્ચ શિક્ષણના તાબા હેઠળના મેટલર્જી વિભાગ (NBA Accredited), સરકારી ઈજનેરી કોલેજ, સેક્ટર-૨૮, ગાંધીનગર ખાતે ગુજકોસ્ટ ડીએસટી સ્પોર્સ, ડીટીઈ અયુવ સામાજિક ફેકલ્ટી ડવલપમેન્ટ પ્રોગ્રામ “પ્રોસેસિંગ એન્ડ કેરેક્ટરાઈઝેશન (PCM 2022)” નું આયોજન તારીખ ૧૮ થી ૨૩ સેપ્ટેમ્બર ૨૦૨૨ દરમિયાન કરેલ છે. આ ફેકલ્ટી ડવલપમેન્ટ પ્રોગ્રામના સંયોજક મેટલર્જી વિભાગના પ્રાધ્યાપકો ડૉ. ડીલન શર્મા તથા પ્રો. ડી. વી. મર્હાન છે. ઉપરોક્ત તાલીમમાં ગુજરાતની વિવિધ નામાંકિત સંસ્થાઓ અને ઈન્ડસ્ટ્રીજ ખાતેથી પાર્ટીશિપેટિંગ ભાગ લીધેલ છે જેનો મુખ્ય હેતુ મોડરિનલસની આધુનિક પ્રક્રિયા અને તેના વિવિધ કેરેક્ટરાઈઝેશન વિષયનું તજજ્ઞો દ્વારા તાલીમ આપવાનું છે. ફેકલ્ટી ડવલપમેન્ટ પ્રોગ્રામનું ઉદઘાટન ડૉ. ગૌતમ ઉપાધ્યાય આચાર્ય, MGITER, નવસારી અને ડૉ. સ્વેતા. પી. દવે, આચાર્ય, સરકારી ઈજનેરી કોલેજ ગાંધીનગરના હલ્લે વિવિધ ખાતાના વડાઓની ઉપસ્થિતિમાં ૧૮મી સેપ્ટેમ્બર ૨૦૨૨ રોજ કરવામાં આવેલ છે.

સરકારી ઈજનેરી કોલેજમાં એન્જિનિયરિંગ ડેની ઊજવાયો



સેક્ટર-૨૮ સ્થિત સરકારી એન્જિનિયરીંગ કોલેજ અને સ્ટુડન્ટ ઓફ મેટાલર્જી એન્જિનિયરીંગ ગાંધીનગરએ સંયુક્ત રીતે ડૉ. એમ. વિશ્વેશ્વરચાર્યની યાદમાં એન્જિનિયરિંગ ડે નિમિત્તે એન્જિનિયરિંગ ડેની ઊજવણી કરવામાં આવી હતી. આ પ્રસંગે વકતૃત્વ સ્વધર્મો યોજાઈ હતી. આ સ્વધર્મમાં પ્રિ-ફાઇનલ યર અને ફાઇનલ યરના વિદ્યાર્થીઓના કુલ મળીને ૧૧ સ્વધર્મકોએ ભાગ લીધો હતો. પ્રોગ્રામના આયોજકો પ્રો. બી.આર. રામા અને એચ.એચ. ઠાકર દ્વારા કાર્યક્રમનું સંચાલન કરાયું હતું.

TECHNO RIDE

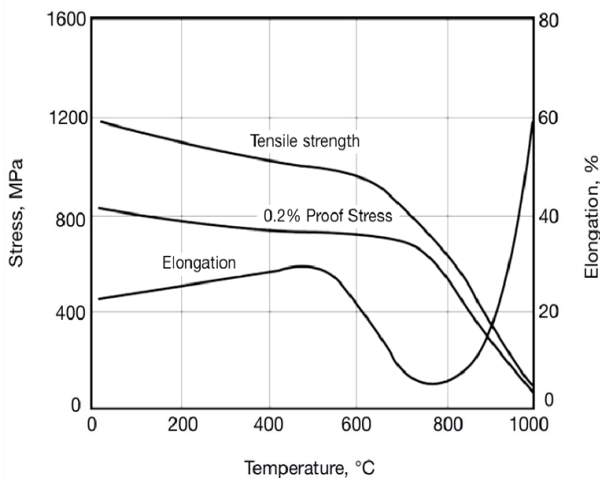
- By, Ms. Madhu kumari (190130121012)

NIMONIC :90

Introduction

A precipitation-hardenable nickel-chromium-cobalt alloy having high stress-rupture strength and creep resistance at temperatures to about 1700°F (920°C). The alloy also has good resistance to high-temperature corrosion and oxidation. Used for blades and discs in gas turbines, hot-working tools, and springs. Standard product forms are round, flats, extruded section, plate, sheet, strip, tube, and wire.

Nimonic 90 is a wrought nickel-chromium-cobalt base alloy strengthened by additions of titanium and aluminum. It has been developed as an age-hardenable creepresisting alloy for service at temperatures up to 920°C (1688°F). The alloy is used for turbine blades, discs, forgings, ring sections and hot-working tools.



CHEMICAL COMPOSITION:-

Element	Composition
Carbon	0.13%max
Silicon	1.0%max
Copper	0.2%max
Iron	1.5%max
Manganese	1.0%max
Chromium	18.0-21.0%
Titanium	2.0-3.0%
Aluminum	1.0-2.0%
Cobalt	15.0-21.0%
Boron	0.02%max
Sulphur	0.015%max
Lead	0.0020%max
Zirconium	0.15%max
Nickel	Balance

Physical properties of nimonic-90

Density	8.18mg/meter cube
Melting range	1310-1370°C
Liquidus temperature	1370°C
Solidus Temperature	1310°C

HEAT TREATMENT :-

Hot working:- NIMONIC alloy 90 should be hot worked in the range 1050- 1200°C (1922-2192°F). Further advice on specific hot working conditions may be obtained from Special Metals Corporation.

Cold Working:- Average mechanical properties pertinent to cold forming operations for 0.6-2.0 mm thick sheet annealed 2-3 min/1150°C(2102°F).

Annealing:- Interstage annealing should be at 1040°C (1904°F) followed by a water quench or air cooling.

Available Products and Specifications:

NIMONIC alloy 90 is designated as UNS N07090 and Werkstoff Number 2.4632. Standard product forms are sheet, strip, plate, round bar, flat bar, forging stock, wire and extruded section.

References:

- <https://www.specialmetals.com/documents/technical-bulletins/nimonic-alloy-90.pdf>
- <https://www.fastwell.in/nimonic-90.html>

TECHNO RIDE

- By, Mr. Chirayu V Pande (200130121004)

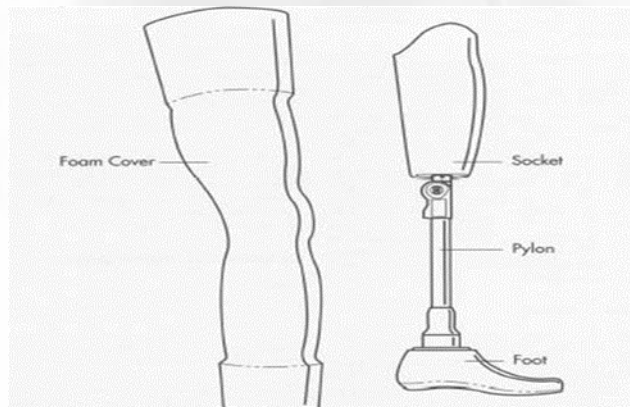
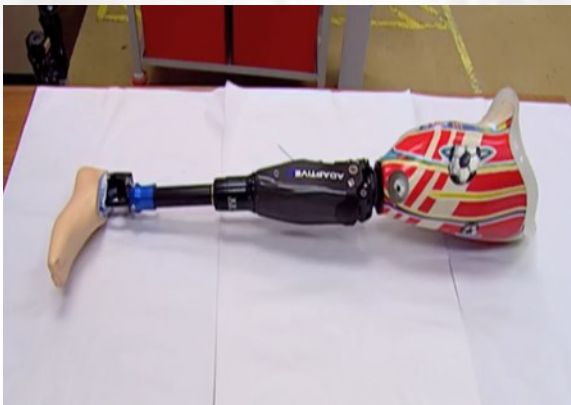
Manufacturing Techniques of Prostheses

Introduction:

In the world of 8 billion people, accidents and Joint Diseases is the common factor. People suffers with diseases like osteoarthritis, rheumatoid arthritis, and post-traumatic arthritis may need surgery requiring implants. These types of the implants are known as Total Hip or Knee Replacement. These orthopedic implants also show the signs of temporary fracture fixation. Because of these signs sometimes it is necessary to insert some fracture fixation devices like screws pins, plates, wires, and nails. Which involves the better function of the fracture fixation devices in vivo. For that there should be a good understanding of the fundamental mechanisms of the materials which are been used.

Materials used in the making:

The main materials which are used in the manufacturing process will be the materials like, Metals and metal alloys, Non-metals like Ceramics, Polymers, and Carbon Fibers. In the metals and metal alloys the main metals which are used are Stainless Steel, Chromium-Cobalt Alloy, Titanium Alloys. Ceramics like Alumina (Al_2O_3), Zirconia (TZP), Silicon Nitride (Si_3N_4) are used to make skin part of the prostheses, Aluminium is used to make in the internal joint part. Polymers are helpful to give the strength to the whole prostheses.



Manufacturing Process:

Prosthetic limbs are not mass-produced to be sold in stores. Similar to the way dentures or eyeglasses are procured, prosthetic limbs are first prescribed by a medical doctor, usually after consultation with the amputee, a prosthetist, and a physical therapist. The patient then visits the prosthetist to be fitted with a limb. Although some parts: the socket, for instance are custom-made, many parts (feet, pylons) are manufactured in a factory, sent to the prosthetist, and assembled at the prosthetist's facility in accordance with the patient's needs. At a few facilities, the limbs are custom made from start to finish. This manufacturing Process is divided into three parts: 1) Measuring and Casting, 2) Making of the Socket, 3) Fabrication of the Prostheses. The First part Measuring and casting, The amputee measurement is taken out and also there a computerised to make the socket. The chemical Iso cyanide and Polio are added to make the foot of the lower limb. Then with the help of the Carbon Fibers the Leg is be made, where the carbon fiber is being heated at high temperature to get thin layer sheet of it. After the leg they make the joint which is made up of the aluminium alloy. Which will give it strength so there will be no need of the Total Hip Replacement. After that, the socket is made from the measurement which are adjusted in the computer. The thin sheet of plastic is used to cover the part of the socket. After that the skin of the leg is made by which the entire part of the Prostheses will be covered and will be safe for the longest time.

Conclusion:

There continues to be great interest in developing new biomaterials for orthopedic implants, using either novel materials, altering the formulations of existing materials, or finding new applications for existing materials. Despite the effective clinical performance of contemporary orthopedic implants, with the expected growth in the use of orthopedic implants and increasing demands placed on the devices by the patients, improving the performance of the devices through the use of "new" biomaterials may aid in addressing these needs.

Reference Links:

- [1] A. Mota, "Materials of Prosthetic Limbs," *Cal Poly Pomona*, pp. 1–7, 2017.
- [2] How artificial limb is made - material, manufacture, making, used, parts, components, structure, procedure (madehow.com)

TECHNO RIDE

- By, Mr. Gunjil Bhavsar (200130121005)

Introduction to Ti6Al4V (Titanium alloy)

This alloy is a $\alpha + \beta$ alloy, with 6 wt. % aluminum stabilizing the α phase and 4 wt. % vanadium stabilizing the β phase. At room temperature the microstructure at equilibrium consists mainly of the α phase (hcp) with some retained β phase (bcc). Depending on cooling rate and prior heat treatment the micro constituents and microstructures are divided into several types namely grain boundary allotriomorph, globular or primary (called bi-modal microstructure when the globular α is surrounded by Widmanstätten platelets), Widmanstätten and basket weave. A recently described microstructure is the bi-lamellar, in which the retained β phase, lying between the α platelets in a Widmanstätten structure, itself contains thinner secondary platelets.

The mechanical properties of Ti-6Al-4V are also affected by the texture of the α phase. Forming processes are usually performed by hot rolling or hot forging in the β phase field or in the $\alpha + \beta$ phase field which generally induces relatively sharp textures in the α phase formed upon cooling. Thus, adaptation of properties for a given application requires good control of the induced texture.

Physical and mechanical properties of Ti6Al4V

Density [g/cm ³]	4.42
Melting Range [°C±15°C]	1649
Specific Heat [J/kg.°C]	560
Volume Electrical Resistivity [ohm.cm]	170
Thermal Conductivity [W/m.K]	7.2
Tensile Strength MPa	1000
Elastic Modulus GPa	114
Hardness [Rockwell C]	36

Chemical composition of Ti6Al4V

Al	V	N	C	H	Fe	O
6.0%	4.0%	0.05%	0.1%	0.0125%	0.3%	0.2%



In the solution treated condition (100% retained β) alloys have good ductility and toughness, low basic strength but excellent formability. Due to the precipitation of β at slightly elevated temperatures, the α alloys in the solution treated condition are not suitable for elevated temperature service without prior stabilization or over-aging treatment.

Applications :

There are many actual applications of this alloy in aircraft where high reliability is required, and further, the availability of abundant data promotes its application. In airframes, it is used for general structural material, bolts, seat rails and the like. In engines, due to the relatively low allowable temperature of about 300°C, the alloy is used for fan blades, fan case and the like in the intake section where temperatures are relatively low.

References

1. JIS H 4600 (TAP 6400H) and ASTM G5
2. aj J A, Pottirayil A, Kailas S V. Dry sliding wear behavior of Ti-6Al-4V Pin against SS316L disk at constant contact pressure. *J Tribol* **139**(2): 021603 (2017)

ART GALLERY

- Photography by, Mr. Nihar Huprikar. 210130121504

"THE MACRO WORLD"



ART GALLERY

Chalna Hamaara Kaam hai – By Shivmangal Singh ‘Suman’

Gati prabal pairon mein bhari
Phir kyun rahoon dar dar khada
Jab aaj mere saamne, Hai raasta itna padaa
Jab tak na manzil paa sakoon
Tab tak na mujhe viraam hai
Chalna hamaara kaam hai

Kuch keh liya, kuch sun liya
Kuch bojh apna baant liya
Accha hua tum mil gayi, kuch raasta hi kat gaya
Kya raah mein parichay kahun
Raahi hamara naam hai
Chalna hamaara kaam hai

fakat yah jaanta
jo mit gaya who jee gya
moond kar palkein sahaj
do ghoont has kar pi gaya
sudha mishrit garal, vah saakiya ka jam hai
chalna hamaara kaam hai

-Written by Dhavalsinh Solanki (200130121007)



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