CURRICULUM VITAE

NAME : KUMUD KANT MEHTA, **DATE OF BIRTH** : 26.05.1974

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AREA OF RESEARCH: (MECHANICAL METALLURGY GROUP)

Indigenization and Development of aerospace grades of Nickel-, Titanium-, Aluminum-, Niobium-based alloys, and special steels. Mechanical working and plastic flow behavior of various aerospace grades of alloys. Effect of thermomechanical processing and heat treatment on evolution of microstructure/crystallographic texture (macro and micro) and their correlation with mechanical properties along with anisotropies in mechanical properties. Optimization of parameters of thermo-mechanical processing. Strain rate and temperature effect on plastic flow behavior of various aerospace materials. Modification of conventional approach of metal working processes. Effect of investment casting, squeeze casting and severe plastic deformation on microstructure and mechanical properties. Tensile, Creep and fatigue behavior of aerospace materials and their failure analysis. Fracture mechanism associated with aerospace materials.

PROFESSIONAL BACKGROUND: (Approx. 22 years of experience in Metallurgical field)

Organization	Designation	Duration	Nature of job
1) National Institute of Technology, Rourkela	Assistant Professor Gr. I (Department – MM)	12.06.2020 to Till date	Teaching and Supervising of B. Tech, M. Tech and Ph.D. Students for their courses and research projects. Principal Investigator for Sponsored (presently DRDO) Research Project and other Consultancy Projects. Other administrative jobs assigned by department and institute.
2) Directorate General of Aeronautical Quality Assurance, (DGAQA), Ministry of Defence, Govt. of India, C/o – HAL Sunabeda, Koraput Odisha-763002.	Principal Scientific Officer (P.Sc.O),	18.06.2018 to 10.06.2020.	Involved in indigenization and development of high pressure turbine disc, low pressure compressor blades, and vanes, titanium and nickel based alloys for manufacture of AL31FP Sukhoi Engine components. Experience in the area of quality inspection during manufacturing of AL31FP Sukhoi Engine from raw material stage to final assembly and testing. Experience in failure analysis, defect investigation of failed aero engine components and Aircraft accident and incident investigation.
3) Directorate General of Aeronautical Quality Assurance, (DGAQA), Ministry of	Senior Scientific Officer-I,	02.07.2012 to 16.06.2018	Responsible for quality assurance, research and development, indigenization and production of aeronautical materials, manufactured at DMRL (DRDO), Hyderabad M/s MIDHANI LTD., Hyderabad and other private vendors. Involved in various

Defence, Govt. of India, C/O-DRDL (DRDO), Kanchanbagh, Hyderabad-58.	Senior Scientific Officer-II, (Through UPSC selection)	08.09.2006 to 01.07.2012	aeronautical material development/ indigenization activities along with related R & D work. Few of the aeronautical materials developed/indigenized are Ni-based Superalloy Supercast-247, Titanium alloy Titan-31 and Titan-1023, Maraging steel MDN 250, Aluminum alloy 2014, 2219 etc. (in different form and sizes).
4) National Test House, Ministry of Consumers Affairs, Kolkata.	Scientific Asst. (Through UPSC)	17.05.2000 to 04.09.2006.	Testing in-charge of the Mechanical behavior group. Responsible for Mechanical testing of materials for general purposes and ISI marking/certification, Training, NABL activities.
5) Rourkela Steel Plant, Rourkela SAIL.	Jr. Mgr. (Operation, Steel Melting Shop)	18.07.1998 to 21.01.2000.	Shift-in-charge of Steel Melting Shop (Operation, LD Furnace), Responsible for melting various grades of steel and their secondary refining for continuous casting.
6) Hindustan Aeronautics Ltd., Aircraft Division Bangalore	Project Engineer	27.03.1998 to 06.07.1998.	Quality Engineering Department, Heat treatment of Aluminum alloys and quality inspection.
7) Lloyds Steel Industries Ltd., Wardha.	Graduate Engineer Trainee	10.10.1996 to 10.06.1997	Worked in QC, R&D department of Cold Rolling Mill and Galvanizing unit.

EDUCATIONAL QUALIFICATION:

Degree	University/ Institution	Year	%Marks	Remarks
B.Sc. Engg. (Metallurgical Engineering)	B.I.T. Sindri, Vinoba Bhave University, Hazaribagh.	1992-1996.	71.33	Ist division with distinction.
M. Tech. (Metallurgical & Materials Engineering)	I.I.T Kharagpur. (As DRDO sponsored candidate)	2008-2010.	9.69 CGPA	Topper in 2008-10 M. Tech. Batch. (Project on low cycle fatigue behavior of Ni-based Superalloy Supercast-247).
Ph.D. in Metallurgical Engineering	I.I.T BHU Varanasi.	2011-2015.	-	Topic: Texture and Mechanical Properties in Nickel-based Solid-Solution Strengthened Alloys

PAPERS PUBLISHED: Sequence – Authors, Title, Journal, Vol., Issue, Pages, Year and DOI

Research Papers

1. Kumud Kant Mehta, Prantik Mukhopadhyay, R. K. Mandal, and A. K. Singh. "Mechanical properties anisotropy of cold rolled and solution annealed Ni–20Cr–8Fe alloy". Materials Science & Engineering A. vol.613, pp.71-81,2014. 10.1016/j.msea.2014.06.067

2. Kumud Kant Mehta, Prantik Mukhopadhyay, Mandal, R K, and Singh, A K. "Mechanical Properties Anisotropy of Cold-Rolled and Solution- Annealed Ni-Based Hastelloy C-276 Alloy". METALLURGICAL AND MATERIALS TRANSACTIONS A. vol. 45A, pp.3493 - 3504, 2014. 10.1007/s11661-014-2294-1.
3. Kumud Kant Mehta, R. Mitra, and Sanjay Chawla. "Effect of post-solutionizing cooling rate on microstructure and low cycle fatigue behavior of a cast nickel based super alloy". Materials Science & Engineering A. vol. 611, pp. 280-289,2014. 10.1016/j.msea.2014.06.003
4. Shaik Khaja, Kumud Kant Mehta, R. Veera Babu, R. Sri Rama Devi, and A.K. Singh. "Mechanical Properties Anisotropy of Isothermally Forged and Precipitation Hardened Inconel 718 Disk". METALLURGICAL AND MATERIALS TRANSACTIONS A. vol.46A, pp. 1140 - 1153,2015.10.1007/s11661-014-2706-2
5. Kumud Kant Mehta, Prantik Mukhopadhyay, R. K. Mandal, and A. K. Singh. "Microstructure, texture and orientation dependent flow behavior of hot rolled and annealed ternary Ni–16Cr–16Mo, Ni–16Cr–4W and Ni–16Cr–8Fe alloys". Materials Characterization. vol.110, pp.175-191, 2015. 10.1016/j.matchar.2015.10.011
6. Kumud Kant Mehta, Prantik Mukhopadhyay, R. K Mandal, and A. K. Singh. "Microstructure, Texture, and Orientation-Dependent Flow Behavior of Binary Ni-16Cr and Ni-16Mo Solid Solution Alloys". METALLURGICAL AND MATERIALS TRANSACTIONS A. vol.46A, pp.3656-3669,2015. 10.1007/s11661-015-2947-8
7. Kumud Kant Mehta, Srinivasa Vadayar K., and Basava Narayana N. "Texture and characterization of mechanical properties in pure nickel". International Journal on Design & Manufacturing Technologies. vol.9, no.1, pp.23-28,2015. 10.18000/ijodam.70147
8. A Pathak, Kumud Kant Mehta, and A K Singh. "A first principles calculation of Ni-16Cr and Ni-16Mo alloys". Journal of Applied Research and Technology. vol.15, pp.78-82,2017. 10.1016/j.jart.2016.10.001
9. Kumud Kant Mehta, R. K. Mandal, and A. K. Singh. "Effects of Mode of Deformation and Extent of Reduction on Evolution of {111}-Fiber During Cold Rolling of Ni-16Cr Alloy". METALLURGICAL AND MATERIALS TRANSACTIONS A. vol.49, no.7, pp.2832-2842,2018. 10.1007/s11661-018-4611-6
10. Kumud Kant Mehta, K S Vadayar, and L Prasad. "Anisotropy in Plain Strain Fracture Toughness (KIC) Property of Maraging Steels". International Journal of Modern Engineering and Research Technology. vol.6, no.1, pp.88-98,2019.
11. Kumud Kant Mehta, K S Vadayar, and L. Prasad. "Constitutive Flow Stress Model of Maraging steels in Cold Flow Formed and Aged conditions". International Journal of Applied Engineering Research. vol.14, no.4, pp.1041-1044,2019.
12. Kumud Kant Mehta, K S Vadayar, and L Prasad. "Effect of Cold Flow Forming and Aging on Mechanical Behaviour of Maraging Steels". International Journal of Research. vol.8, no.2, pp.761-777, 2019.
13. Roopchand Tandon, Kumud Kant Mehta, R. Manna, and R. K. Mandal. "Microstructure and Mechanical Properties of the AA7075T7352 Aluminum Alloy". Trans Indian Inst Met., vol.74, no.6, pp.1509–1520,2021. http://dx.doi.org/10.1007/s12666-021-02222-9
14. R. Tandon, Kumud Kant Mehta, R. Manna, and R. K. Mandal. "Effect of tensile straining on the precipitation and dislocation behavior of AA7075T7352 aluminum alloy". Journal of Alloys and Compounds. vol.904, pp.163942,2022. http://dx.doi.org/10.1016/j.jallcom.2022.163942
15. Kumud Kant Mehta. "Temperature dependent constitutive plastic flow behaviour of titanium alloy Ti6Al4V" International Journal of Materials Research, vol. 114, no. 4-5, 2023, pp. 359-367. https://doi.org/10.1515/ijmr-2022-0059
16. Krishna Chaitanya Katakam, Ganesh Katakareddi, Kumud Kant Mehta and Natraj Yedla. Mechanical stability and microstructural evolution during torsion in pristine and defect nickel

nanowires of different orientations: a molecular dynamics simulation study, Molecular Simulation, 2023, Vol. 49, No. 8, 829–844, https://doi.org/10.1080/08927022.2023.2193650
17. Kumud Kant Mehta, R K Mandal, and A K Singh. "Effect of Modes of Deformation by Cold Rolling on Microstructure, Texture and Mechanical Properties of Ni-16Cr and Ni-16Mo Alloys". Journal of Materials Engineering and Performance (online published on 12th June, 2023), https://doi.org/10.1007/s11665-023-08392-5
18. Kumud Kant Mehta, "Effect of variation of cold-rolling strain-paths on the microstructure, texture and mechanical properties of alloy Ni-16Cr-8Fe". Materials Today Communications, vol. 37, 2023, 107070. 2023, https://doi.org/10.1016/j.mtcomm.2023.107070

Conference Papers

1. Kumud Kant Mehta, S. Khaja, and A. K. Singh. "Orientation Dependent Strain Hardening Behaviour of Isothermally Forged and Precipitation Hardened Inconel 718 Disc". Materials Today: Proceedings. vol.4, no.2, pp.883-889, Dec 2017, http://dx.doi.org/10.1016/j.matpr.2017.01.099 0.40
2. Kumud Kant Mehta, R K Mandal, and A K Singh. "Orientation Dependent Work Hardening Behavior of Cold Rolled and Solution Annealed Hastelloy C-276 Alloy.". Materials Today: Proceedings. vol.4, no.2, PP.277-284, Dec 2017, http://dx.doi.org/10.1016/j.matpr.2017.01.022
3. Kumud Kant Mehta, P. Mukhopadhyay, R. K. Mandal, and A. K. Singh. "Microstructure, texture and mechanical properties anisotropy of Ni- 16Cr and Ni-16Cr-16Mo solid solution alloys in hot rolled and annealed condition". Materials Today: Proceedings. vol.2, no.4-5, PP.1127-1135, Feb 2015. http://dx.doi.org/10.1016/j.matpr.2015.07.021
4. Yogesh Singh, Sailesh Bhuyan, and Kumud Kant Mehta. "Effect of strain rate on the compressive strength and texture of maraging steel grade 250". Materials Today: Proceedings. 2023, https://doi.org/10.1016/j.matpr.2023.05.666
5. S. Manojkumar, and Kumud Kant Mehta, "Effect of TiB2 on mechanical and corrosion properties of Al 7075/TiB2/Gr composite prepared by stir casting". Materials Today: Proceedings. 2023, https://doi.org/10.1016/j.matpr.2023.05.033

SPECIFICATION / QUALITY PLAN PREPARED / APPROVED:

Release specification approved and released for Maraging steels (grade MDN 250A) forged bars for air launched NGARM and Astra Missile; Aluminium alloy HF-15/AA2014 forgings in T652 condition for air frame and avionic packages for ASTRA Missile and for counter measure dispensing (CMDS) for Jaguar aircraft; Quality Plan prepared for production of 15CDV6 steel comprising processing of raw material to manufacture of finished product for Aakash missile.

BOOK / CHAPTER PUBLISHED

Book chapter (Chapter 20): Aero stores (Materials) inspection and quality assurance; K. K. Mehta and S. Chawla, Aerospace Materials and Material Technologies, Volume 2, Aerospace Material Technologies; N. Eswara Prasad and Russell Wanhill (Eds.), ISBN: 978-981-10-2142-8, 2017, Publisher: Springer Singapore, Publication type: International, DOI: 10.1007/978-981-10-2143-5.

RESEARCH SCHOLAR SUPERVISED:

Research Topic	Scholar Name	University / Institute	Status / Year of award
PG Thesis: Effect of rolling mode on mechanical properties anisotropy and evolution of texture for pure Nickel and pure Iron.	Nunna Basavanarayana (M. Tech, 2010-2013)	Jawaharlal Nehru Technological University, Hyderabad	Completed; 31st Dec, 2013

PG Thesis: Mechanical properties anisotropy of isothermally forged and precipitation hardened Inconel 718 alloy disc.	Shaik Khaja (M. Tech, 2011-2014)	Jawaharlal Nehru Technological University, Hyderabad	Completed; 08th May, 2015
PG Thesis: Effect of flow forming and aging on mechanical behaviour of Maraging steel grade C 250	Prasad Lingampalli (M. Tech, 2015-2018)	Jawaharlal Nehru Technological University, Hyderabad	Completed; 23rd Oct., 2018
PG Thesis: Effect of Re-ageing treatment on tensile flow behavior of AA7075 T6 aluminium alloy	Mithilesh Kumar (220MM1482)	NIT, Rourkela	Completed, 2022
Ph.D.: Strain path and orientation dependent plastic flow behavior of refractory alloy Nb-10Hf-1Ti.	Yogesh Singh (521MM1002)	NIT, Rourkela	Ongoing. (Ph.D. admission year: Autumn, 2021).
Ph.D.: Effect of thermomechanical processing on microstructure and mechanical properties of AA2099-based Al-Cu-Li alloys with different Cu/Li ratios.	S. Manojkumar (521MM1004)	NIT, Rourkela	Ongoing. (Ph.D. admission year: Autumn, 2021).
Ph.D.: Effect of alteration in alloying element content of Inconel 718 alloy based filler wire on the microstructural and mechanical properties modification of the welded joint.	Vivek Kumar (920MM5002)	NIT, Rourkela	Ongoing. (Exe Ph.D. admission year: Autumn, 2021).

PROFESSIONAL TRAINING RECEIVED/SHORT-TERM COURSES ATTENDED

Training Year	Nature of Training	Duration	Organization where training was provided
1998	First Article Inspection of Aeronautical Stores.	01 day	HAL, Aircraft Division, Bangalore
2004	Documentation and Implementation of ISO/IEC 17025 for Testing and Calibration Laboratories.	03 days	Centre for Electronics Test Engineering, ETDC, Kamlanagar, Hyderabad.
2006	CEP (Continuing Education Program) on Titanium alloy.	05 days	RCMA (DRDO) Hyderabad
2007	Foundation course for Aeronautical Quality Assurance	21 days	ALISDA, Director General of Aeronautical Quality Assurance, Bangalore
2010	Indian Society for Non destructive Testing Level II certificate for Ultrasonic testing of materials.	14 days	M/s Midhani Ltd., Min. of Defence, Kanchanbagh, Hyderabad.
2010	CEP (Continuing Education Program) on Statistical analysis of the materials data for aero design in year 2010.	05 days	RCMA (DRDO) Hyderabad
2010	Workshop on failure analysis.	02 days	DMRL, Hyderabad.
2012	Workshop on electron microscopy.	03 days	IIT, BHU, Varanasi.
2016	Lead Auditor training: AS 9100 Quality	7 days	Engineering staff college of

	Standard for Aerospace application		India, Gachibowli, Hyderabad
2018	AL31FP Engine Workshop (Su30MKI)	03 days	HAL, Koraput Division.

AWARDS AND HONOURS:

1) Agni award for self reliance for indigenization of various aluminium alloys, Year 2015, Awarded by Outstanding Scientist and Associate Director, DMRL, DRDO, Hyderabad for outstanding contribution.
2) Awarded for successful indigenization of airworthy Aluminium alloy 2014 AA and Maraging steel MDN 250A grades of materials for Astra Missile, Year 2014, Award given by Project Director, Astra Missile, DRDL, DRDO, Hyderabad for significant contribution.
3) Best Paper award at "International winter school 2010 on advanced aeronautical materials" held at Hyderabad and organised by RCMA (Mat.), DRDO, Hyderabad.
4) Received appreciation letter from RDCIS, Ranchi, (SAIL) for devising new tensile test facility for roof bolts testing, analyzing test data and coordinating the R & D project jointly organized by NTH(ER), Kolkata and RDCIS (SAIL), Ranchi, year 2005.
5) Received appreciation letter from M/s Midhani Ltd, Defence PSU, for contribution towards optimization of heat treatment cycle of MDN 132 grade of forged bars, Year 2017.
6) Nominated as Main member of Material Standard Sub - committee (MSSC) by Department of Standardisation, Ministry of Defence for the period Aug, 2016 to June 2018, and the responsibility was to prepare standard / specification for various metallic materials of defence use.

PROJECT HANDLED / LABORATORY OR FACILITY DEVELOPED

Sponsored research project:

1. Aeronautical Research and Development Board (ARDB), DRDO – Optimization of post investment casting HIPing treatment of aerospace grade Ti-6Al-4V alloy for improvement of fatigue life – 2023-2026.

Consultancy Projects:

1. As PI: Development of Supernickron alloy with heat treatment to achieve hardness 320-350 BHN (2022) – Completed.
2. As Co-PI: Analyses of Fatigue Failure in Cast Aluminum Alloy Wheels (2022) - Completed
3. Coordinated a research project between National Test House (ER), Ministry of Consumer affairs, Food and Public Distribution, Govt. of India, Kolkata and RDCIS (SAIL), Ranchi in year 2004-2005 related to development of roof supports in underground coal mines. Devised new tensile test facility for roof bolts testing and established related laboratory, analyzed test results, suggested measures to improve the quality of roof bolts. A letter of appreciation was awarded in this regard from RDCIS (SAIL) Ranchi.
4. Lab Development: Developed Non-Destructive Laboratory at MM department of NIT, Rourkela

PROFESSIONAL BODY MEMBERSHIP:

Life member of Indian Institute of Metal, Kolkata.
Life member of Society of Failure Analysis, Hyderabad.
Life member of Indian Society for Non-Destructive Testing, Chennai.
Associate Member for Institute of Engineers, Kolkata.

All the information given above is true to the best of my knowledge and belief.

(Kumud Kant Mehta, EC-1201379)
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NIT, Rourkela.