

DR. SANJAY KUMAR GUPTA

(PH.D. IIT-BHU VARANASI)



**Assistant Professor, Department of Mechanical Engineering,
Institute of Engineering and Technology, Lucknow, India**

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Teaching Experience: 4 Years

GATE Exam: Qualified 4 times (Year 2014, 2015, 2016 & 2025)

Subjects Taught: Manufacturing Process, Basic Mechanical Engineering, Engineering Drawing, Computer Integrated Manufacturing

Research Interest: Friction Stir Welding, Gas Metal Arc Welding, Material Characterization

EDUCATION

Year	Qualification / (Branch)	Institution / Board	Percentage /CGPA
2021	Ph.D. (Production Engineering)	Indian Institute of Technology (Banaras Hindu University), Varanasi	7.00
2016	M. Tech. (Material Engineering)	Jadavpur University, Kolkata	7.41
2014	B. Tech. (Mechanical Engineering)	M. J. P. Rohilkhand University, Bareilly (State Govt. university)	8.00
2008	12 th	CBSE	63.60 %
2006	10 th	CBSE	78.60 %

RESEARCH EXPERIENCE

Ph.D. – Indian Institute of Technology, (Banaras Hindu University), Varanasi, India (2016-2021)

Thesis Title: Friction Stir Processing of Gas Metal Arc Welded Ferritic Stainless Steel.

Thesis Supervisor: Dr. Mohd. Zaheer Khan Yusufzai

Summary of Doctoral Thesis

The research was focused on exploring the applicability of friction stir processing as a technique to refine the coarser grains of the ferritic stainless steel AISI 409L welded by using Gas metal arc welding process. Initial work has been carried out to optimize the GMAW process parameters to produce butt welds in plates of AISI 409L using ER304L (austenitic grade) filler material. Butt welds were produced on 3 mm thick plates using different heat input conditions (by varying the welding current, welding voltage, and welding speed). The weldments were tested for hardness, tensile strength, residual stress and Charpy impact toughness. The weldments with the best combination of mechanical properties obtained at optimized process parameters have been further refined using friction stir processing. These process parameters (shoulder diameter, rotational speed, and processing speed) were varied in a range of parametric window to study the effect of these parameters on friction stir processing of the welded plate. Processed welded plates were characterized (hardness, tensile strength, residual stress and Charpy impact toughness) to assess the mechanical and metallurgical properties. The processed region in the weld metal and the HAZ both consisted of refined grains of approximate size of 3 microns. Thus, It was found that problem associated with grain coarsening of heat affected zone has been resolved by using friction stir processing upon the welded plate.

M. Tech. – Jadavpur University, Kolkata, India, (2014 – 2016)

Thesis Title: Development of SAW (Submerged Arc Welding) Flux from Alumina Brick and AOD Slag.

Thesis Supervisor: Prof. T. K. Pal

Summary of Master's Degree Thesis

The research work was focused on the recycling of industry waste material (alumina brick and Argon-Oxygen Decarburization slag) to develop the submerged arc welding flux. Since SAW flux plays an important role in deciding the weld metal quality and simultaneously flux constitutes half of the total welding cost in SAW, development of recycling technology to use the steel plant slags could be advantageous from both economical and environmental perspective. In the present study, Argon-Oxygen Decarburization (AOD) slag produced during stainless steel making and considered as waste material has been recycled to SAW flux after modification. A total of eight different all-weld metals were produced using eight different combinations of flux ingredients. The chemical composition, microstructure, inclusion analysis, XRD, micro-hardness and tensile strength of the all-weld metals were evaluated. It has been possible to develop all-weld metal strength to the level of YS:372 MPa and UTS:513 MPa using the recycled AOD slag.

TEACHING EXPERIENCE

- **Current Job-** Department of Mechanical Engineering, Institute of Engineering and Technology, Lucknow from 05-02-2025.

- **Previous job-**

- Department of Mechanical Engineering, World College of Technology and Management, Gurgaon, from 01-08-2024 to 04-02-2025.
- School of Engineering and Information Technology, Sanskriti University, Mathura, from 07-08-2023 to 31-07-2024.
- Department of Mechanical Engineering, Maharishi University of Information Technology, Lucknow, from 04-10-2021 to 31-07-2023.

SKILLS AND ABILITIES:

Academic level:

- Held the position of Examination Coordinator for duration of 2.8 years.
- Taught a range of subjects.
- Conducted lectures, seminars, and practical sessions to facilitate student understanding and engagement.
- Designed assessments, examinations, and grading criteria to accurately evaluate student performance and progress.
- Actively participated in faculty meetings, academic committees, and professional development workshops to contribute to the continuous improvement of the department and university.

Research level:

- Expertise in various welding techniques like Gas metal arc welding and Friction stir welding
- Friction stir processing of different materials like Aluminium, mild steel, stainless steel
- Fabrication of composite materials using friction stir processing technique
- Metallurgical analysis and material characterization like metallographic study, hardness testing, tensile testing, Charpy impact testing and non-destructive characterization.

Instruments level:

- Experimental proficiency with welding equipment like Gas metal arc welding and Friction stir welding
- Proficient in hardness testing machine and optical microscope.

Software: AutoCAD, SOLIDWORKS

LIST OF PUBLICATIONS

JOURNAL PAPERS

- Mithlesh Kumar Mahto, Adarsh Kumar, **Sanjay Kumar Gupta**, Pradeep Kumar, Meghanshu Vashista and Mohd Zaheer Khan Yusufzai* (2026) "Failure analysis of refractory tungsten carbide tool containing different cobalt percentages during friction stir cladding of copper on steel", Engineering Failure Analysis, <https://doi.org/10.1016/j.engfailanal.2026.110592> (**Q1 Journal**).
- **Sanjay Kumar Gupta**, Mithlesh Kumar Mahto, Avinash Ravi Raja, Meghanshu Vashista and Mohd Zaheer Khan Yusufzai* (2024) "Effect of friction stir processing on the mechanical properties of gas metal arc welded AISI 409 L stainless steel

plate”, Materials Today Communications,
<https://doi.org/10.1016/j.mtcomm.2024.111075> (SCI-Expanded). **(Q1 Journal)**.

- **Sanjay Kumar Gupta***, Avinash Ravi Raja, Meghanshu Vashista and Mohd Zaheer Khan Yusufzai (2020) “Effect of Gas Metal Arc Welding on Magnetic Response of Ferritic Stainless Steel”, Arabian Journal for Science and Engineering, <https://doi.org/10.1007/s13369-020-04338-4> (SCI-Expanded). **(Q1 Journal)**.
- **Sanjay Kumar Gupta***, Avinash Ravi Raja, Meghanshu Vashista and M. Z. Khan Yusufzai (2019) “Hysteresis loop analysis of gas metal arc welded ferritic stainless steel plate”, Materials Research Express, <https://doi.org/10.1088/2053-1591/ab2f6e> (SCI-Expanded journal). **(Q2 Journal)**.
- **Sanjay Kumar Gupta***, Avinash Ravi Raja, Meghanshu Vashista and M. Z. Khan Yusufzai (2018) “Effect of heat input on microstructure and mechanical properties in gas metal arc welding of ferritic stainless steel”, Materials Research Express, 2018
<https://doi.org/10.1088/2053-1591/aaf492> (SCI-Expanded journal). **(Q2 Journal)**.
- Avinash Ravi Raja, **Sanjay Kumar Gupta**, Meghanshu Vashista and Mohd Zaheer Khan Yusufzai, (2019) “Material characterization of friction stir welded IS-2062 steel plate by hysteresis loop analysis”, Materials Research Express, <https://doi.org/10.1088/2053-1591/ab45c1> (SCI-Expanded journal). **(Q2 Journal)**.
- M. Z. Khan Yusufzai, Avinash Ravi Raja, **Sanjay Kumar Gupta**, M. Vashista, (2018) “Barkhausen Noise analysis of friction stir processed steel plate”, Indian Journal of Engineering & Materials Sciences
<https://doi.org/10.56042/ijems.v27i3.45069> (SCI journal). **(Q3 Journal)**.

CONFERENCE PAPERS

- **Sanjay Kumar Gupta***, Shivansh Mehrotra, Avinash Ravi Raja, Meghanshu Vashista, Mohd Zaheer Khan Yusufzai “Effect of welding speed on weld bead geometry and percentage dilution in gas metal arc welding of SS409L”, 9th International Conference on Materials Processing and Characterization (ICMPC - 2019) conducted by Department of Mechanical Engineering of GRIET, Hyderabad during 08-10 March 2019 (Published in materials today proceedings: Scopus Journal). <https://doi.org/10.1016/j.matpr.2019.07.497>.
- **Sanjay Kumar Gupta***, Adarsh Kumar, Avinash Ravi Raja, Meghanshu Vashista, Mohd Zaheer Khan Yusufzai, “Magnetic hysteresis loop behaviour of welded ferritic stainless steel 409L with the variation of magnetic field intensity”, 10th International Conference on Materials Processing and Characterization (ICMPC-2020), conducted by Department of Mechanical Engineering, GLA, Mathura, during February 21st-23rd 2020 (Published in materials today proceedings: Scopus Journal). <https://doi.org/10.1016/j.matpr.2020.02.354>.
- **Sanjay Kumar Gupta***, Mithlesh Kumar Mahto, Avinash Ravi Raja, Meghanshu Vashista, Mohd Zaheer Khan Yusufzai, “Characterisation of welded plate through micro-magnetic technique”, 2nd International Conference on Processing and Characterization of Materials (ICPCM-2019), conducted by Department of Metallurgical and Materials Engineering, National Institute of Technology, Rourkela, during December 12th-14th 2019 (Published in materials today proceedings: Scopus Journal). <https://doi.org/10.1016/j.matpr.2020.03.121>.

- Mohd. Zaheer Khan Yusufzai*, **Sanjay Kumar Gupta**, Mithlesh Kumar Mahto, Avinash Ravi Raja and M. Vashista, “Effect of single pass friction stir processing on magnetic properties of steel”, 13th International Conference on Barkhausen Noise and Micromagnetic Testing (ICBM13-2019), conducted by Charles University, Prague, Czech Republic during September 23-26, 2019.
- Vikram singh rana, **Sanjay Kumar Gupta**, Avinash Ravi Raja, Meghanshu Vashista and Mohd Zaheer Khan Yusufzai, “TIG welding of commercially pure titanium grade 2”, National welding seminar (NWS –Kochi 2018), organised by The Indian Institute of Welding during 13-15th December 2018.
- Varsha Chaubey, Dr. P. Sudhakar Rao and **Sanjay Kumar Gupta** (2018) “Cladding of Mild Steel Plates Using GMAW Process: A Review”, International Conference on Advances and Soft Computing Applications in Design and Manufacturing (ASCADM-2018) conducted by Department of Mechanical Engineering, National Institute of Technology, Patna during 4th-6th June, 2018, Page 382-385.
- Presented poster entitled “Cladding of Mild Steel with Copper using Gas Metal Arc Welding Process” in IIW-IC 2017, Chennai, during 7-9 December, 2017.

PEER REVIEWER

- Material Research Express journal
- Engineering Research Express journal
- Arabian Journal for Science and Engineering

HOBBIES / INTERESTS

- Playing Chess & Badminton

ACADEMIC ACHIEVEMENTS

- Secured First division throughout the academic career.
- Secured 3rd position in poster presentation on the Institute day in 2018.
- Qualified GATE Exam 4 times (Year 2025, 2016, 2015 & 2014).

PERSONAL INFORMATION

Father’s Name: Chaturbhuj Gupta

Date of Birth: 15th July 1991

Marital status: Married

Address: Village + Post- Barhni Chafa, District- Siddhartha Nagar, Uttar Pradesh, India, Pin code 272189, India

Mother’s Name: Kalawati Devi

Spouse name: Shalini Raj

REFERENCES

Name: Dr. M. Z. Khan Yusufzai

Designation: Professor (IIT-BHU)

Email: mzkhan.mec@iitbhu.ac.in

Contact No: 8853229620

Name: Dr. Meghanshu Vashista

Designation: Professor (IIT-BHU)

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