



Department of Mechanical Engineering

Government College of Engineering, Bargur

(An Autonomous Institution Affiliated to Anna University)

Krishnagiri District – 635104, Tamil Nadu.

Center of Excellence in Thermal Spray Coating (COE-TSC)

At the Center of Excellence in Thermal Spray Coating (COE-TSC), Government College of Engineering, Bargur, we are dedicated to offering state-of-the-art facilities and comprehensive support for research, training, and development in the field of coatings. With cutting-edge technology and a team of experienced professionals, COE-TSC provides a wide range of services and resources tailored to the needs of students, faculty, and industry partners.

Facilities and Equipment:

- **Sand Blasting Equipment:** Sand blasting is essential for surface preparation, particularly in coating and welding applications. It removes surface contaminants like rust, scale, and old coatings, ensuring a clean substrate for further processing.
- **Cold Spray Coating Setup:** This setup employs automated robotic systems to apply coatings through a high-velocity impact of cold materials. By combining robotic welding technology, this system ensures precise, repeatable deposition with consistent layer thickness. It is widely used for wear resistance, corrosion protection, and restoring damaged components in aerospace, automotive, and industrial applications..
- **Grinding and Polishing Machine:** This machine refines and prepares material surfaces for inspection or coating by removing surface irregularities and achieving the desired finish. Integrated with Tungsten Inert Gas (TIG) welding equipment, it enhances weld quality by automating the process for smooth, defect-free joints. TIG welding is particularly suited for precision applications like stainless steel and aluminum..
- **Optical Microscope with Image Analyzing Software:** This advanced microscope enables detailed examination of material microstructures, coating uniformity, and weld bead quality. The accompanying software allows for image analysis, such as grain size measurement, phase distribution, and defect identification.
- **Abrasive Cutting Machine:** Specialized tool designed to make precise cuts in hard materials such as metals, ceramics, composites, and other engineering materials. It uses a high-speed rotating abrasive wheel to achieve clean and accurate sections without causing significant thermal damage to the workpiece.
- **Mounting Machine:** This equipment encases samples in a protective medium for easy handling during metallurgical analysis. It is often used before grinding, polishing, or microscopic examination.

Address: Advanced Center of Excellence in Coating (ACOE-C)

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Services Provided by COE-C:

Research and Development (R&D):

- **Coating Process Development:** Custom development of coating processes for specific applications, including wear resistance, corrosion protection, and thermal insulation.
- **Materials Research:** Exploration and characterization of novel coating materials, including ceramics, composites, and rare earth-based coatings.
- **Innovation in Coating Technologies:** Advancement of methods like Cold Spray Coating, Thermal Spray Coating, and Chemical Vapor Deposition (CVD).
- **Microstructural Analysis:** Using advanced optical microscopes and image analysis software to evaluate coatings for defects, grain structure, and adhesion quality.
- **Hardness and Mechanical Property Testing:** Determining the hardness, tensile strength, and wear resistance of coated materials.
- **Surface Roughness and Adhesion Testing:** Assessing the finish and bonding strength of coatings to ensure quality and durability.
- **Workshops and Faculty Development Programs:** Regularly organized training sessions on advanced coating technologies, including AICTE ATAL-sponsored programs.
- **Hands-On Training for Students and Researchers:** Practical exposure to state-of-the-art equipment like Cold Spray Coating setups, TIG welding machines, and abrasive cutting tools.
- **Skill Development for Industry Professionals:** Specialized courses aimed at upgrading the technical skills of professionals in the coatings and welding industries.
- **Process Optimization:** Helping industries optimize their coating and surface preparation processes for improved efficiency and cost-effectiveness.
- **Failure Analysis and Problem Solving:** Investigating coating or material failures to recommend solutions and improvements.
- **Custom Coating Services:** Providing tailored coating solutions to meet specific industrial requirements.
- **Sandblasting Services:** Surface cleaning and preparation to ensure optimal coating adhesion.
- **Grinding and Polishing :** Achieving precise surface finishes on samples or components.
- **Abrasive Cutting and Mounting:** Preparation of high-quality specimens for microstructural or metallurgical studies.

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- **Industry-Academia Collaboration:**
Partnering with industries for joint research projects, technology transfer, and knowledge sharing.
- **International Collaboration:**
Supporting Indo-German and other international research collaborations in surface engineering and coating technologies.

At ACOE-TSC, we are dedicated to fostering innovation, excellence, and industry-academia collaboration in coating. Contact us to explore partnership opportunities and leverage our resources for your coating needs

In-charge of ACOE-TSC
(D.Thirumalaikumarasamy, AP/Mech)

Head of the Department
(Dr.P.Thirumal, Professor of the
Mech.Engg)

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