Best Technology Solutions (BTS)

Fundamentals of Welding Engineering (AWSASME) Training program

Introduction:

The course covers the basic science and practical application of the most commonly utilized welding processes along with other essential topics such as: welding terminology, weld design, welding safety, electrical theory, the weldability of metals, and welding quality control. This course is designed for the individual that needs to expand the candidates' core competence on the subject of welding. Designers, inspectors, managers, or welders with a need to understand the fundamentals of welding benefit from the practical aspects of welding technology offered here.

To introduce the various welding and cutting processes, this course gives an understanding of AWS filler metals specifications, types of welding flaws, related ASME Section V requirements for NDE, and the QA systems necessary for welder performance qualification. This course is also an excellent learning experience for people seeking a general knowledge in welding and related NDE.

Course Objectives:

By the end of this course delegates will be able to:

- Learn about the fundamentals of welding engineering conforming to AWS and ASME standards and codes

Who Should Attend?

Inspectors, welders, welding supervisors, quality control personnel, technologists, and engineers involved with welding for new fabrication, repairs, maintenance, and inspection for pressure vessel or piping. **TOPICS**

Course Outline:

Introduction to Arc Welding Processes

Terms and Definitions

Welding, Brazing and NDT Symbols

Welding Hazards and Accident Prevention

Welding Metallurgy

Shielded metal arc welding (SMAW)

- Gas tungsten arc welding (GTAW)
- Gas metal arc welding (GMAW)
- Submerged arc welding (SAW)
- Flux-cored arc welding (FCAW)
- Selection of arc welding processes
- Advantages and limitations of each process

Introduction to Cutting Processes

- Principles of operation, equipment, application, and metallurgical effects of the following metal cutting processes
- Oxygen cutting
- Air-carbon-arc cutting and gouging
- Plasma-arc cutting
- Carbon-arc cutting

AWS Welding Filler Metal Specifications in ASME Sec. II Part C

- SFA-5.1/SFA-5.1M Carbon Steel Electrodes for Shielded Metal Arc Welding
- SFA-5.4/SFA-5.4M Stainless Steel Electrodes for Shielded Metal Arc Welding
- SFA-5.5/SFA-5.5M Low-Alloy Steel Electrodes for Shielded Metal Arc Welding
- SFA-5.9/SFA-5.9M Bare Stainless Steel Welding Electrodes and Rods
- SFA-5.11/SFA-5.11M Nickel and Nickel-Alloy Welding Electrodes for Shielded Metal Arc Welding
- SFA-5.12/SFA-5.12M Tungsten and Oxide Dispersed Tungsten Electrodes for Arc Welding and Cutting
- SFA-5.14/SFA-5.14M Nickel and Nickel-Alloy Bare Welding Electrodes and Rods
- SFA-5.17/SFA-5.17M Carbon Steel Electrodes and Fluxes for Submerged Arc Welding
- SFA-5.18/SFA-5.18M Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding
- SFA-5.22 Stainless Steel Electrodes for Flux Cored Arc Welding and Stainless Steel Flux Cored Rods for Gas Tungsten Arc Welding

Introduction to NDE Fundamentals and ASME Section V

- The applications, examination processes, requirements, uses, benefits, limitations, personnel qualifications, physical weld defects, and acceptance criteria of the following NDE methods as detailed in
- ASME Section V:
- Visual examination
- Radiographic examination
- Ultrasonic examination
- Liquid penetrant examination
- Magnetic particle examination