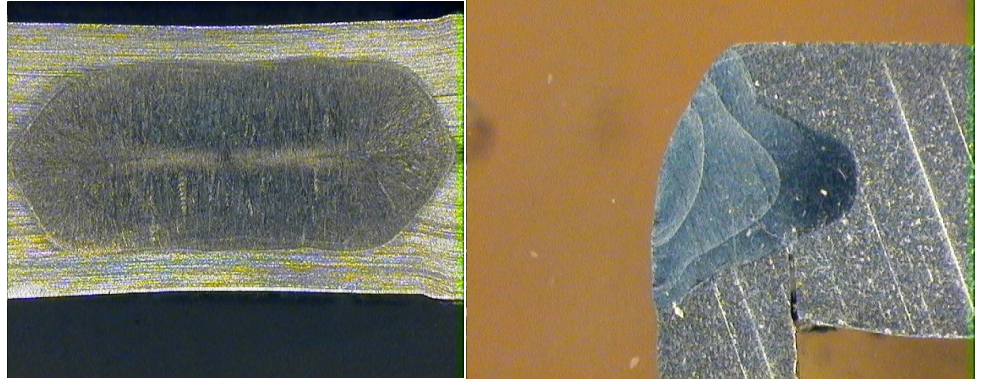


Two-day Course

Metallurgy and Welding

Course Contents

1. Introduction
2. Mechanical Metallurgy
3. Physical Metallurgy
4. Welding Processes: Resistance Welding, Laser Welding, Arc Welding with introduction to other processes such as friction, ultrasonic, diffusion, and explosion welding
5. Case Studies



This course is designed for technical personnel who routinely deal with welding issues including design, R&D, manufacturing, and quality assurance. The course combines understanding of physical and mechanical metallurgy with welding processes and quality. Combination of all those aspects will give attendees a good understanding of the issues that they have to deal with in developing a new weld design or improving quality of an existing weld. The first section on mechanical metallurgy deals with atomic structures, grain boundaries, alloys, deformation, yield and tensile strength, melting point, fracture toughness, and material property relationships. The second section on physical metallurgy discusses phase diagrams, equilibrium and non-equilibrium solidification, eutectics, intermetallics, solidification and liquation cracking, heat treatment, followed by review of important alloy systems. On the second day, we review the most commonly used welding processes including resistance welding, laser welding, and arc welding, with brief introduction to few related processes. This course is designed for the engineers and managers who will be making decisions on material selection, process selection, equipment and capacity analysis, quality metrics, and functional life of the welds to meet the needs of their customers.

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