

Two-day Course (Advanced) Laser Welding and Materials Processing

Course Contents:

Day 1

1. Light and Lasers
2. Types of Lasers
3. Beam Characteristics and Propagation
4. Laser-Material Interaction
 - effect on metals, glass, ceramics, and plastics
5. Laser Welding
 - pulsed and CW welding
 - shielding gases

Day 2

1. Welding Metallurgy
 - mechanical metallurgy
 - physical metallurgy
2. Metals and Alloys
 - Steels, Stainless Steels, Aluminum, Titanium, Dissimilar metals, & platings
3. Laser Process Development
4. Case Studies
5. Laser Safety and System Selection
6. Summary

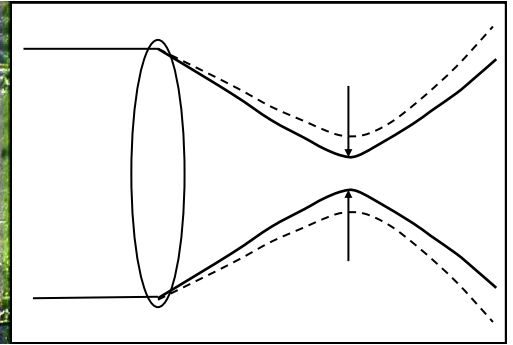
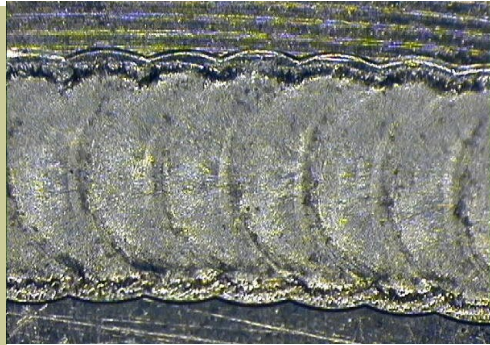
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This two-day course is designed for engineers, managers, and quality personnel to get a broad understanding of laser technology and laser welding. We start with an introduction to basic concepts and properties of ordinary light and LASER light followed by a section of laser light generation in YAG, fiber, and disc lasers. The next section deals with propagation of laser light as it exits the laser cavity and navigates through laser fibers, mirrors, beam splitter, focus heads, wobble heads, trepanning heads, and galvo heads. We then focus on the physical phenomenon involved with interaction of lasers with materials including metals, ceramics, glass and plastics. In the next section, we focus on developing an understanding of pulsed and CW welding, along with effect of shielding gas. On the second day, we explore aspects of mechanical and physical metallurgy followed by section on specific intricacies of steels, stainless steels, titanium, aluminum, and dissimilar metals. The section on laser process development brings together all aspects of laser welding discussed during the course and is designed to help attendees conduct a thorough design review on any welding project. Case studies are presented at the end of the course using real world problems. Section on laser safety and systems focuses on important issues of safety and system design. Attendees are encouraged to bring their own case studies for discussion.