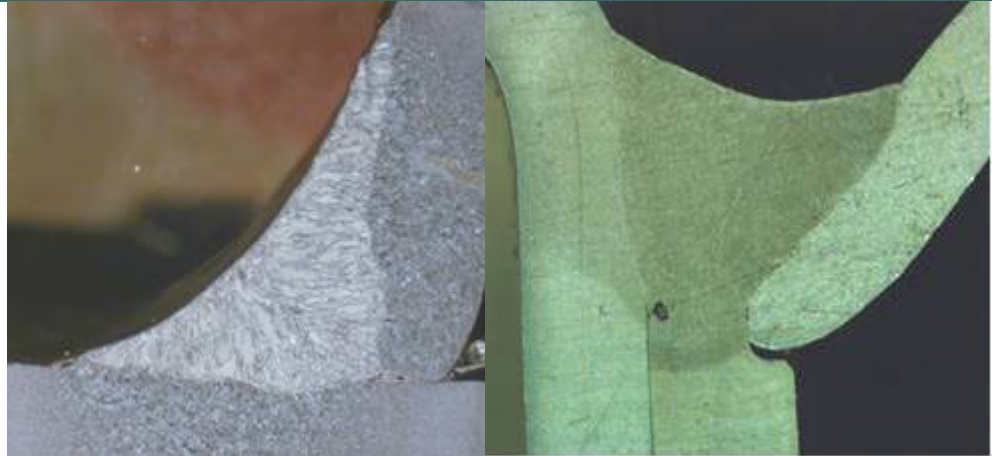


Half-day Course GMAW (Gas Metal Arc Welding)

Course Contents

1. Introduction to GMAW
2. Steel Metallurgy and Solidification
3. Process Variables
4. Weld Defects
5. Welding Quality & Specifications



GMAW, previously known as MIG welding, is one of the most commonly used arc welding processes in the automotive industry. Benefits include high production speeds and the ability to add filler metal for strength. This course introduces users to the fundamentals of GMAW, starting with an introduction to process physics, including welding modes (spray transfer and globular transfer), the effect of polarity, and torch angle. In the second section, we will review steel metallurgy and chemistry as it relates to the solidification of steels and the formation of different phases such as austenite, ferrite, and martensite; the effect of alloying elements and impurities on weld quality and defect formation will also be presented. The next section covers process variables such as voltage/current control, shielding gases, wire speed, electrode orientation, and joint position. The following section will cover weld defects (overlap, undercutting, underfill, porosity, incomplete fusion, weld metal cracks, and heat-affected zone cracks) and present strategies to reduce defects using process control. The last section delves into weld quality and the use of welding standards to set limits and tolerances on weld defects to make sure that welded parts meet customer requirements.

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