GMAW End Weld Parameter Development For HF-EFW Tube Manufacturing Process

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LTV-Copperweld in Shelby, OH uses a single pass GMAW process to join two steel coils end-to-end in order to operate a continuous HF-ERW tube mill. Currently, there are no set parameters for the end-joining process and improper welds are frequently made wasting money in mill downtime and lost material. Developing process procedures and parameters will reduce the number of missed (improper) welds.

One concern with the end-joining process is the limited amount of material that is stored within the "looper" which provides a stationary location for the end welding process to occur. The material feed rate of the mill limits the torch travel speed that controls the voltage and wire feed speeds used to produce the end-welds. Another concern is the amount of convexity on the face of the weld that must be removed so the strip may travel safely through the mill.

Using a laboratory environment, several sample welds similar to those from the mill were produced, and cross section analysis and bend tests were performed. Using a modified ArcWise™ method, a weldability lobe curve for the process was created, and parameters were found that would improve weld quality, performance, and cycle time to save LTV-Copperweld time and money.