

## WHY INTERPASS TEMPERATURE CONTROL IN WELDING

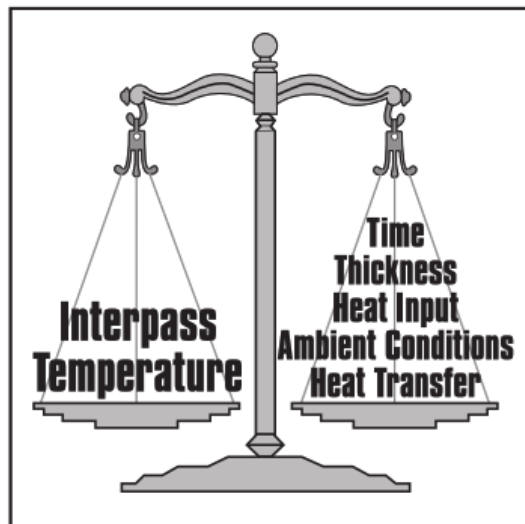


Figure 1. Balancing the variables of interpass temperature.

**It may be important to control the maximum interpass temperature when certain mechanical properties are required**

## **A Delicate Balance**

Particularly on sensitive base metals, the minimum interpass temperature must be sufficient to prevent cracking, while the maximum interpass temperature must be controlled to provide adequate mechanical properties. To maintain this balance, the following variables must also be considered: time between passes, base metal thickness, preheat temperature, ambient conditions, heat transfer characteristics, and heat input from welding.

## **Why Is Interpass Temperature Important?**

Interpass temperature is just as important as, if not more important than, preheat temperature, with regard to the mechanical and microstructural properties of weldments. For instance, the yield and ultimate tensile strengths of the weld metal are both a function of the interpass temperature. High values of interpass temperature tend to reduce the weld metal strength.

Additionally, higher interpass temperatures will generally provide a finer grain structure and improved Charpy V notch toughness transition temperatures. However, when interpass temperatures exceed approximately 500 °F (260 °C), this trend is reversed. For example, the American Welding Society (AWS) Position Statement on the Northridge Earthquake recommends that the interpass temperature should not exceed 550 °F (290 °C) when notch toughness is a requirement.