TOP 50 Post-Weld Heat Treatment (PWHT) Questions and Answers

1. What is the primary purpose of PWHT?

Answer:

The primary purpose of PWHT is to relieve residual stresses induced by welding, enhance mechanical properties, and reduce the risk of cracking in the welded component.

2. Which materials typically require PWHT after welding?

Answer:

Materials that typically require PWHT include carbon steels, low-alloy steels, certain stainless steels, and high-strength steels.

3. How does PWHT improve the toughness of a welded joint?

Answer:

PWHT improves toughness by tempering the brittle microstructures that may form during welding, such as martensite, and promoting a more ductile phase.

4. What is the difference between PWHT and preheating?

Answer:

Preheating is applied before welding to reduce the cooling rate and minimize the formation of brittle microstructures, while PWHT is applied after welding to relieve residual stresses and enhance mechanical properties.

5. How does PWHT affect the microstructure of the Heat-Affected Zone (HAZ)?

Answer:

PWHT refines the microstructure in the HAZ by tempering martensite or other hard phases, leading to improved ductility and reduced residual stresses.