

PREHEATING AND POST-HEATING METALS FOR WELDING, BRAZING, AND SOLDERING

A simple and effective way to preheat and post-heat metal objects to reduce joint failures

Application

When welding, brazing, or soldering metals such as steel, aluminum, inconel, stainless steel, and other ferrous or nonferrous alloys, joint failures and other defects can occur due to the extreme thermal stresses imposed by rapid heating and cooling at the connection area. Preheating and post-heating the connection area is done to better prepare the surfaces and slow the cooling process to reduce the potential for joint failure. It also drives out moisture which may also cause problems. As a result, there is less rework required and the finished piece performs better. Technicians in this field governing bodies such as ASME, API, ASM, NAVSEA, and proprietary entities, have codes that require preheating and post-heating many metals when welding, brazing, or soldering.

BriskHeat assisted with a preheating application for a submarine manufacturer who was welding large steel beams to reinforce a nuclear reactor chamber within a nuclear submarine. The steel beams were 6 in thick x 12 in wide x 120 in long (152 mm thick x 305 mm wide x 3,048 mm long). Preheating to 360°F (182°C) before joining was critical to prepare the surface, and post-heating to ensure a slow enough cooling rate to avoid failure was also required. Preheat temperatures can vary from metal to metal depending on carbon/alloy content and thickness but are generally 175°F to 500°F (79°C to 260°C). To be truly effective, preheating and post-heating must be uniform across the entire joining area. Depending upon the size and shape of the materials being joined, hours of manpower and large amounts of fuel could be wasted using other heating methods such as torching or steaming. Hotspots and uneven heating are likely to occur when preheating in these manners. Additionally, torching or steaming greatly increases the risk of technicians sustaining burns.



Solution

BriskHeat BWH heavy insulated fiberglass heating tapes can deliver heat up to 1,400°F (760°C). They have a high-watt density of 13.1 W/in² (2.0 W/cm²) which ensures a rapid thermal response and even distribution of heat. BWH fiberglass heating tapes are safer, more efficient, and provide more even heat for pre and post-heating than other methods such as torching or steaming. They are exceptionally flexible and easily conform to complex shapes, making them ideal for a variety of difficult metal joining applications. Industrial heating applications require temperature controllers that can be sealed from dust. BriskHeat's BH-510, TB4000, and TC4000 controllers meet the requirement with IP65 and IP66 enclosures. Heater, power, and temperature sensors are all connected through sealing glands in the enclosure. These can be wall mounted or mounted to a frame using mounting clips or plates (optional).

In other applications where the required heat is never more than 450°F (232°C), BriskHeat full line of BS0 silicone heating tapes or SRL silicone heating blankets are an effective solution.



Additional Uses

BWH heavy Insulated fiberglass heating tapes can also be used to preheat and expand metals for the insertion or removal of components within an assembly or to remove moisture for testing, and more.

Industries

Aerospace/Aviation	Heavy Industry/Mining
Construction	Manufacturing
Food & Beverage	Transportation
Processing	Wastewater Treatment
Gas Handling	

Types of Users

Welding Technicians
Production Managers
Design Engineers
Fabricators & Builders