

# SermaLoy™ J

## PRODUCT DESCRIPTION

SermaLoy J is a diffused slurry aluminide coating with a unique silicon-enriched layer. It is effective in protecting gas turbine hot section components at temperatures up to 1835 °F (1000 °C).

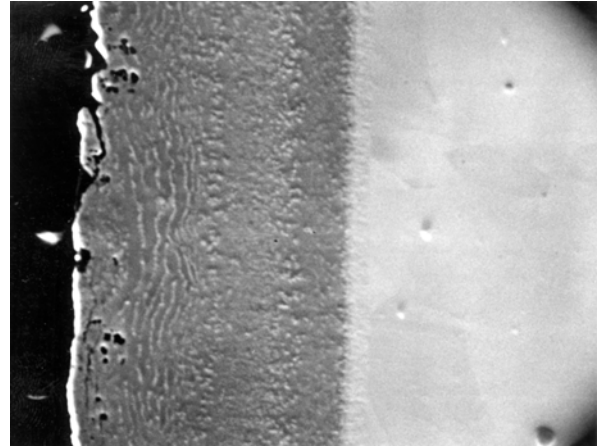
Benefits of SermaLoy J include:

- Excellent resistance to both high and low temperature hot corrosion (LTHC and HTHC)
- Excellent resistance to high temperature oxidation
- Excellent resistance to particulate erosion
- Compatibility with most nickel and cobalt based superalloys, as well as austenitic stainless steels
- Flexibility of diffusion processing that eliminates the need for resolutioning/precipitation/aging heat treatments

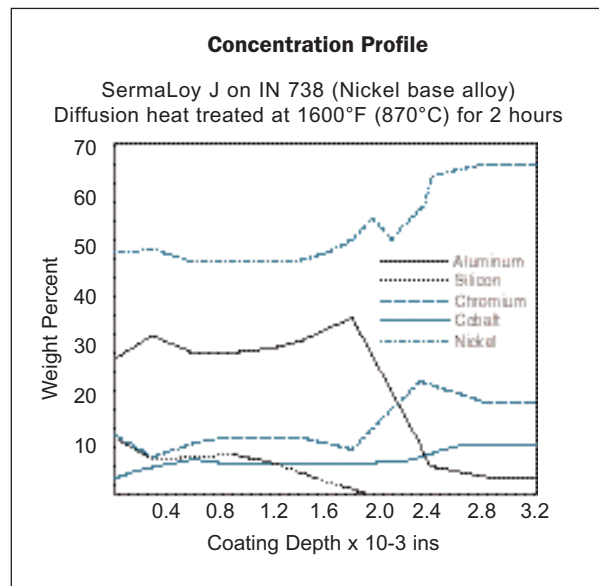
SermaLoy J is an intermetallic nickel aluminide with a silicon-enriched outer layer. The presence of silicon on the surface of the coating promotes the formation of a tightly adherent scale of very pure aluminum oxide ( $Al_2O_3$ ) that is very resistant to dissolution by the liquid sulfate salts that cause hot corrosion. The excellent high temperature oxidation resistance of SermaLoy J is due in part to reduced oxygen mobility through the pure alumina as well as to the stabilizing effect that the silicon has upon the aluminide.

Silicon in SermaLoy J also helps prevent thermal fatigue cracking. Thermally induced strains caused by unequal rates of heating and cooling of the surface and interior of a component are a common cause of degradation in conventional aluminide coatings. Cracking almost always originates within these coatings and propagates into the base metal. In SermaLoy J, if cracking does occur, it tends to be arrested at the inter-diffusion zone and does not propagate into the substrate.

With the SermaLoy J slurry aluminizing process, each component is coated individually, thus each can be inspected before diffusion. At this intermediate stage, repair or rework of the slurry coating can be accomplished without any loss of base metal. Using a slurry also greatly simplifies masking and allows selective coating of very localized regions – which is ideal for repair – or alternatively, large areas like ducts and burner cans.



SermaLoy J slurry aluminide on Waspaloy (diffused at 1625 °F (885 °C) for 2 hours).  
Backscatter electron image, 1000X.



The SermaLoy J slurry aluminide can be formed between 1600 °F and 1835 °F (870 °C and 1000 °C). Diffusion cycles may be tailored to each alloy and application. Expensive resolutioning, precipitation, and aging treatments can be avoided by diffusing around 1600 °F (870 °C). This relatively low diffusion temperature not only eliminates the microstructure changes associated with high temperature aluminizing processes, but also allows brazed components to be refurbished without risking damage to the brazed joints.