Ni-Ti handles continuous distortion and kinking. It presents many advantageous properties such as super-elasticity, corrosion resistance and biocompatibility. In addition, the shape, stiffness and other properties of Nitinol can be controlled by chemical composition, heat treatment and temperature.

The Challenge

Ni-Ti is a very versatile material, but has rather difficult weld-ability and is expensive. For many medical applications it is beneficial to use Ni-Ti for only a portion of the device, and weld a different less expensive material such as stainless steel for the remaining portion of the device. This combination enables for cost reduction, because of Nitinol’s high cost, and additionally provides for manufacturing improvements. It is commonly known that disadvantages of Ni-Ti are difficult machine-ability, because of its elasticity and hard surface, and problematic weld-ability.

The Engineered Solution

After a complete analysis of the manufacturing process, a custom plating process was developed by ProPlate® to gold plate the ends of the Ni-Ti and stainless steel components before welding. Custom tooling was used to mask and plate the device within quality specification. Nitinol oxidizes naturally, which is what inhibits a weld to adhere properly, but the addition of gold to each end of the device allows for a fusible area between the two components. This innovative solution produces cost savings without sacrificing part performance, while increasing tensile strength. Additionally, the gold that is applied can be used as a radiopaque marker for certain applications.