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Design and Processing Considerations for Nitinol Medical Devices

Nitinol has become a widely used material for medical devices due to its unique superelastic and shape memory properties. These characteristics enable innovative device designs and functionalities that are not possible with conventional materials.

However, designing and processing Nitinol-based devices requires careful consideration of multiple factors. Material selection, processing methods, parameter control, and the sequence of manufacturing steps all play critical roles in determining the final device performance.

This presentation will provide an overview of typical process flows for manufacturing Nitinol devices. It will explore how design choices, material selection, and key processing steps—such as laser cutting, shape setting, and surface treatments—impact mechanical properties, fatigue performance, and corrosion resistance. Special considerations for coating Nitinol devices with expanded polytetrafluoroethylene (ePTFE) will also be discussed.

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