

Study of Energy Dissipation in Shape Memory Alloys: A Comparison between Austenite and Martensite Phase of SMAs

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Abstract : Shape memory alloys with high capability of energy dissipation and large deformation bearing with return ability to their original shape without too much hysteresis strain have opened their place among the other damping systems as smart materials. Nitinol which is the most well-known and most used alloy material from the shape memory alloys family, has high resistance and fatigue and is coverage for large deformations. Shape memory effect and super-elasticity by shape alloys like Nitinol, are the reasons of the high power of these materials in energy depreciation. Thus, these materials are suitable for use in reciprocating dynamic loading conditions. The experiments results showed that Nitinol wires with small diameter have greater energy dissipation capability and by increase of diameter and thickness the damping capability and energy dissipation increase.

Keywords : shape memory alloys, shape memory effect, super elastic effect, nitinol, energy dissipation

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