



Memory Golf Clubs

Being in the swing of things is only one consequence of products using technology commercialized by Memry® Corporation of Brookfield, Connecticut. Incorporating proprietary shape memory alloys, a new line of golf wedges and putters has been developed.

Memry Corporation's investigation of shape memory effect (SME) stems from Marshall Space Flight Center contracts to study materials for the space station. SME is a property of certain metal alloys that can change from shape to shape depending on temperature fluctuations. Starting in the late 1980s and early 1990s, Memry made use of its NASA-spurred expertise to create a line of home and industrial safety products.

A proprietary, high-damping shape memory alloy called Zeemet® has been developed by Memry specifically for the golf industry. The Nicklaus Golf Equip-

ment Company of West Palm Beach, Florida has created a new line of golf clubs using Zeemet inserts.

The value of applying shape memory metal into golf club inserts is twofold: its superelastic and high damping

attributes. For the avid golfer, that translates into more spin on the ball, greater control and a solid feel.

Upon closer examination, the club insert basically undergoes a split second change in its metallurgical structure upon impact with the golf ball. This elastic property keeps the ball on the club face longer. That supplies more spin to the ball but not at the expense of distance. More "bite" on the fairway is every golfer's desire.

The science of shape memory has permitted Memry Corporation to generate an assortment of commercial sales.

For instance, McDonnell Douglas of St. Louis, Missouri and Memry signed a contract in February 1996 to develop a unique control surface for helicopter blades. Memry is designing and manufacturing small microprocessor-controlled tabs for the trailing edges of the helicopter blades. By controlling the tabs, a pilot can fine tune each blade for improved performance and reduced vibration. The actuation that provides the tab motion is a shape memory alloy torsion device.

Memry's Super-Elastic Nitinol materials have many application within the medical equipment industry. As a binary nickel-titanium alloy, Nitinol can accommodate large strain deformations and spring back to their original shape when stress is removed. This element, therefore, is suitable for catheter guide wires, lesion localizers, suture anchors and dental arch wires.

Other Memry products already available to the consumer include MemrySafe®, an anti-scald product; UltraValve®, a temperature selection and control system for baths and showers; and FireChek®, a reusable fire safety valve for industrial facilities.

MemrySafe is built around the ability to instantly restrict water flow in shower or sinks before scalding. Comprising a memory metal alloy, a patented valve reacts to temperature, not pressure. The unit can sense hazardous scalding water, reducing the flow of hot water to a trickle. When the scalding temperature drops to a less dangerous level, the unit automatically resumes normal flow.

UltraValve is a touch-of-the-button bathing feature. With the press of a button, water can be turned on or off, with water temperature selected according to personal preference. Exact water temperature is displayed at every moment on a user-friendly control panel. This "smart bathing" system also protects its user from scalding water.

FireChek provides for emergency shut down of process control lines that handle flammable and toxic fluids and gases. This product can be applied to any pneumatically-operated process valve. If excessive heat is sensed by the shape memory element, the system immediately vents the pneumatic actuator pressure. This closes the supply line. FireChek is suitable for process industries such as petrochemical, chemical, semiconductor, pharmaceutical and large oil and gas fired boilers.

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Jack Nicklaus insert wedges using shape memory metal offers vibration damping qualities that make a real difference on the golf course.

Properties of metal alloys studied for the Space Station program have sparked a new line of golf clubs. Shape memory metal gives the most seasoned golfer new control and feel.