

For Immediate Release



Shape Memory Alloy (SMA) Wire Offers Solenoid Replacement Design

Providing Less Weight, Lower Power Consumption and better Reliability

San Diego, CA - - Autosplice has announced the development of new cost-effective solenoid-replacement designs for commercial applications using Shape Memory Alloy (SMA) wire. For a number of years, Autosplice has been an industry leader in the design and assembly of practical real-world applications using SMA wire made from nickel titanium materials. These SMA solenoids can be effectively used as simple, low-mass, low-power, low-cost alternatives to larger and more costly conventional solenoid designs.

Nitinol is a family of intermetallic materials that contain a nearly equal mixture of nickel and titanium, with other elements added to adjust or "tune" the material properties. Nitinol exhibits a combination of unique characteristics including "Shape Memory" and "Superelasticity" that enable nitinol wire to actuate when electrically heated, dynamically changing the internal structure at certain temperatures. As the wire cools it returns to its original structure or shape.

Building upon a strong history in the automation of wire insertion and splicing technologies, Autosplice has quickly moved to the forefront when it comes to interconnects for SMA wire for attachment to PCBs and other assemblies. Building on a track record of proven SMA applications in the medical and automotive industries, Autosplice is now pioneering the use of SMA wire as a solenoid-replacement for small solenoid applications such as those used in irrigation products. These SMA wire solenoid designs offer significant advantages in terms of overall cost and functional benefits.

The commercial irrigation market faces some significant challenges and limitations with regard to current solenoid technology. Solenoids used in this industry have recently gone through significant cost increases due to fluctuations in world copper prices. In addition, the water used in many larger irrigation projects is becoming increasingly corrosive which dramatically reduces the capability and maintainability of current solenoid designs.

Some of the key benefits of using SMA wire actuation include:

- Compact actuation for smaller devices such as compartment latches, sprinkler valves, vents etc.
- Lighter weight
- Higher reliability & repeatability over millions of actuations
- Better resistance to corrosion
- Lower-cost (no susceptibility to fluctuations in the price of copper)
- Improved flow control (actuation flexibility)

In addition to the inherent cost, reliability and maintainability advantages, the improved flow control from SMA actuators offers a key benefit for the overall irrigation system operation. One of the disadvantages in the use of standard solenoids is the fact that actuation is very fast, with an immediate switch from “off” to “on”. One consequence of this high actuation speed is “water hammer” in which the uncontrolled fast input of water under pressure can break joints in the water pipes. In contrast, in the Autosplice SMA wire design, actuation is much slower, allowing a more controlled transition from “off” to “on” and thereby diffusing the impact of a lot of water going into the system at one time.

As the industry’s foremost expert in applied-designs using SMA wire through automated manufacturing processes, Autosplice can also design custom SMA interconnect solutions specific to our customers design.

Autosplice is a leading manufacturer of terminals, component assemblies and applicator systems, providing automated solutions for high-volume electrical interconnections. Autosplice systems enable substantial cost savings and provide superior reliability over conventional connector products and assembly methods.

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