Magnets as an alternative to Velcro

Gwen Spicer, Spicer Art Conservation, LLC & Michael Dunphy , SmallCorp Inc.

Trouble with Velcro

Textiles have been hung using Velcro since the 1970s, with little change of technique. Concern with the use of Velcro began in the 1990's when discoloration of the product was being noticed. Several conservators became concerned and were suspicious of product alterations resulting in color change and hook breakage. Even so, Velcro is still used today due to the lack of another suitable solution.
Could magnets be an alternative or even a substitute?

Magnetic System Basics

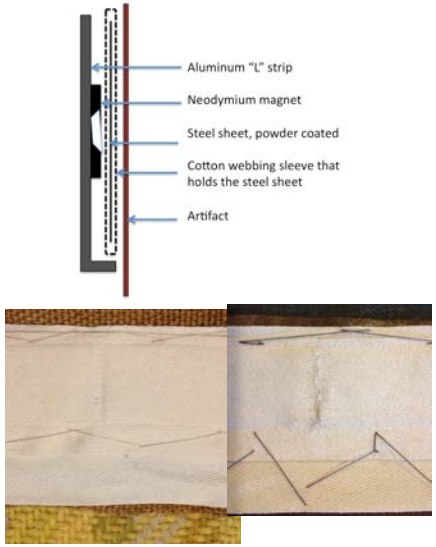
The philosophy and design of the Velcro system can be applied to a magnet-based system. A rule of thumb for Velcro is that is can support about 100 lbs per square inch. Magnetic systems are not quite as simple, but they may be better for the artifact in the long-term. When using and selecting magnets of any type, there are three key variables to consider (Spicer 2013a, b & 2014):

1. **The potential strength of the magnet**
2. **The magnet-receptivity of the receiving steel behind the textile**
3. **The gap, or the thickness of the material layers between the magnet and the receiving steel**

Each is a significant factor in how the magnet behaves or is able to perform the task.
The full strength of the magnet selected is only reached if the ferromagnetic material used as the receiving metal is sufficiently thick. If you are using a steel plate, the minimum is 24-gauge steel before any coating is applied (like galvanization or powder coating). It is important to remember that as the metal's thickness increases, the gauge number decreases.

Magnetic Solution

The challenge of using magnets with textiles is that unlike paper, textiles can be quite heavy, creating a concern with downward pull of the artifact, or failure/compression of the artifact at the magnet site. One solution to the weight issue is an aluminum strip with a small lower lip (L-shaped in cross-section) fastened horizontally to a wall. Grade N42 magnets, measuring ¾" dia. x 1/8" thick, with counter-sunk holes, are fastened to the vertical face at 6" intervals. A 22-gauge steel strip (typically 1 1/4" wide) is stitched into a sleeve at the upper edge of the artifact. In this solution, the protruding lower lip of the angle supports the weight of the artifact, while the magnets hold the steel to the aluminum mounting element. The solution appears to have unlimited potential. A textile weighing 60 lbs. was successfully hung with this magnetic system.
The secured magnets can be adjusted closer or further away from the vertical side, making the lip's depth smaller if the protrusion is too large for any specific situation.



Webbing Sleeve

Attaching a sleeve to the artifact to hold the steel strip has several benefits. Most significantly, there is no concern about the magnet compressing the artifact - all of the system elements are behind the artifact. The selected magnet can be as strong as needed to support the weight of the artifact.
A sleeve for the steel strip is easily made from two widths of cotton twill tape, 2" and 3" wide (TestFabrics #5 and #6). This size works well with a 1 ¼" wide steel strip. In this scenario, the sleeve creates the gap. The two rows of machine-stitching need to be well-placed so they are tight enough around the steel to prevent vertical slippage, while loose enough to allow the steel to slide in and out of the sleeve. Once the sleeved webbing is positioned along the upper edge of the artifact, it is hand-stitched using a herringbone stitch.
The ends of the sleeved webbing can be left open so the steel can be easily removed, or stitched/sealed closed. This decision will be based on the needs of the artifact and its owner.

Supplier of Hardware

This magnetic hanging solution can be purchased from SmallCorp. SmallCorp provides the metal components sized to your specifications (The "L" shaped aluminum with the attached magnets and the powder-coated steel strip). The conservator or preparator creates the webbing sleeve to hold the powder-coated steel, just as one would for a Velcro system. And you are ready to go!

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Spicer Art Conservation, LLC
518/765-2142
www.spicerart.com
gwen@spicerart.com

Wood & Wood Inc. dba
SmallCorp, Inc
800/925-9500
www.smallcorp.com
mike@smallcorp.com

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