

下一代通用铝箔更容易装卸、使用更安全、而且能省去装载夹具。每次使用后从框架上卸下的通用铝箔可提供生产率优势。通过在制造中省去了网状覆盖过程，可达到更快的交货时间。由于从单价中省去了铝框架的价格，而且用户只需投资购入少量通用框架，所以交货的模版可能价格更低。这些模版可在更小的仓储区域或橱柜中更有效地储藏，操作人员要花的气力较小。

Next-Generation Interchangeable Foils

Neil MacRaild

Improved foils are easy to load and unload, safe to use and even eliminate loading jigs.

Metal laser-cut stencils have been built by securing the stencil foil permanently within a polyester or stainless steel mesh-covered aluminium frame. This frame-mounted construction method is intended to last the life of the stencil and continues to be popular because it is durable and customers can acquire small numbers of foils at low cost.

But interchangeable foils that are removed from the frame after each use can offer productivity advantages to many users. By eliminating the mesh covering process from manufacture, a faster delivery time can be achieved. The delivered stencil can cost less, too, because the price of

the aluminium frame is eliminated from the per-unit price; users need only invest in a relatively small number of interchangeable frames. On the factory floor, interchangeable stencils can be stored more efficiently within a smaller storage area or cabinet and retrieved from storage more easily, demanding less physical strength on the part of operators.

Interchangeable stencil users have been primarily high-mix manufacturers. They benefit from considerable cost savings, as each interchangeable foil is less expensive to produce than a frame-mounted stencil. For each frame the company owns, large numbers of lightweight, low-cost interchangeable foils can be purchased as required.

The interchangeable foil features a row of mounting apertures stamped or cut along each edge of the stencil foil during manufacture. The frame has a row of retractable pins corresponding to each row of stencil apertures, which are engaged as the stencil is mounted in the frame



FIGURE 1: For set-up, the stencil is placed in a loading base and tensioned on the frame.

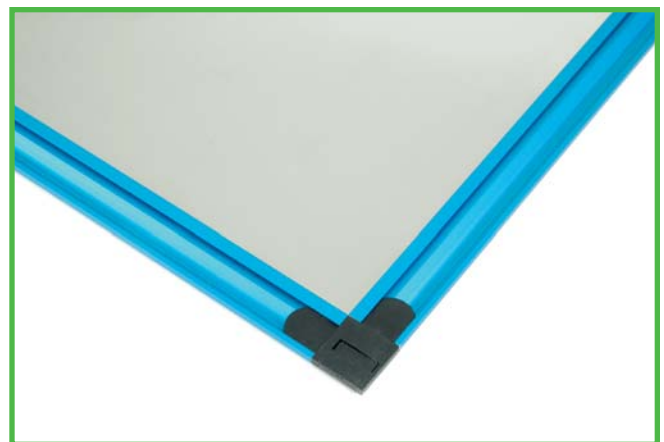


FIGURE 2: The aluminium edge makes foils easier to handle.

prior to use. Every stencil is supplied in its own wallet and can be stored in custom-built cabinets.

Set-up is simple and requires little physical effort. The stencil is placed in a loading base and tensioned on the frame, with tensioning pneumatically assisted using a foot-operated actuator (**Figure 1**). The stencil is then ready to be mounted in the screen printer.

The pneumatic mounting system automatically applies the correct tension in the x and y axes of the foil, which is important for good stencil separation. This tension also ensures a good gasket seal between stencil and board as the squeegee or enclosed material delivery head passes across the stencil surface.

Because of its complexity – moving parts and an integrated tensioning mechanism – the frame is slightly more expensive than a permanently mounted frame. However, a relatively low number of frames could suffice; two for each printer in use, for example. In a high-mix environment, this can cut costs. Internal estimates predict the foils cost at least 30% less than a frame stencil because new products do not require full new frame stencils, just the foil. Frames can be manufactured in a variety of sizes to fit specific printing platforms or applications.

The interchangeable foil concept, introduced several years ago, has recently undergone significant change. Improvements have been made in loading and unloading, removal and replacing from storage, and moving around the shop floor.

A new ergonomic design protects the steel edge of the foil with a smooth guard made from an extruded aluminium profile. The guard is attached to the foil during manufacture (**Figure 2**), before the foil is packaged and shipped to the user, and allows operators to manipulate each foil quickly, accurately and safely during setup and changeover.

Also, new foils no longer require a loading jig. This potentially removes an extra piece of equipment from the facility; companies can now just save the foils.

After use, the new foils can be loaded directly into a cleaning system. Unlike first-generation models, they do not have to be re-mounted in a specially designed cleaning frame. Eliminating the need for a loading jig and special washing frames makes the foils easier to use and reduces opportunities for error.

Changeovers can be accomplished more quickly. Internal studies showed changeover

times at about 10 sec. for the simple drop-on process, vs. minutes for conventional stencils. With the aluminum profile guarding the steel edge, operators can handle the foil more safely. This feature not only delivers a protection benefit, but also contributes to faster, smoother activity on the shop floor. ■

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