printing the future

MEMBRANE SWITCH SPECIFICATION GUIDE

Membrane switches are custom designed by Sun Industries to meet each of our clients unique requirements. Our goal is to incorporate these needs in a cost effective manner that will meet or exceed the operating criteria. This design guideline will provide a valuable communication tool. It will help reduce design time and cost, and result in the best possible design.

Standard Construction of a Membrane Switch

A membrane switch is composed of a number of layers, each providing essential features to the final product. The composition of each of these can vary between manufacturers. **It is important to ensure you are dealing with a company that has the engineering, design and printing expertise to ensure your final product functions for an extended period and presents your company professionally through superior print quality.**

Sun Industries manufactures membrane switches to a number of specifications. Briefly, a standard membrane switch is composed of the following elements:

- Graphic Overlay
- Spacer Layer
- Domes
- Membrane Layer
- Rear Adhesive
- Rigid Sub Panel

Artwork Guidelines

Sun Industries accepts many forms of artwork. We work natively in Macromedia Freehand 8.0. To ensure the most efficient production we prefers the supply of artwork to the following specifications:

- Adobe PDF	
- Adobe Illustrator (V5.5, V7.0, V8.0, V10.0)	Save as EPS with 8-bit Mac header. Can import original formats **up to V10.0**
- Adobe Photoshop (V3.0, V4.0, V5.5, V6.0)	Save as CMYK or Greyscale .tiff. **Mac format, no LZW compression**
- Macromedia Freehand (V8.0.1)	Export as native file.
- Corel Draw (V5.0, V7.0, V8.0, V9.0)	Save as AI, **Text as Curves only** **Or** Save as Corel Draw **Version 7** with all object and bitmap compression off. (under advanced settings when saving)
- Quark Xpress (V3.3r3, V4.0)	Export text as .rtf. Export single page as .eps
- Word Processors (Text Only)	Save text as .rtf

- Mechanical Information: **Clearly dimension** outside shape, all cutouts and windows, and any areas to be selectively gloss or matt, or to have selective adhesive.

- Colours: It is **critical to provide an accurate colour specification** with your artwork. This can be either selection and specification of PMS colours, or supplied samples of printed colour to match. CMYK colours contained in supplied artwork files are **not an accurate representation** of colour due to the differences in monitors, digital print and colour output devices. What you see on your screen will vary from what you receive in proof.

- **All files supplied by email should be .zip or .sit archives** to protect the drawing from being corrupted during file transfer. **Ensure that any PC files are zipped only** (.exe files cannot be accepted)

- If you are supplying artwork with fonts (text), you will need to include copies of the **fonts used.** Any placed scans should be included as separate CMYK or greyscale .tiff files.

Graphic Overlay

Material Options

- Polycarbonate .25mm Gloss/Velvet, Matt/Velvet or Gloss/Gloss finishes.
- Polyester .175mm Gloss or .2mm Textured

Colour Matching

- Colour Samples (Preferred) – samples 100mm x 100mm on selected stock.
- PMS Number – Some variation can occur with ink adjustment on selected material.

Textured Background

- Pre-Textured Material or Printed Texture.
- Sample finishes are available on request.

Window Finishes

- Fine Textures, Velvet Textures, Satins, Glosses or Special Custom Designed patterns.
- Sample Finishes are available on request.

Colour Trapping

- Light colours should be trapped behind darker colours in order to avoid a halo effect.
- Minimum thickness for a borderline used for trapping should be .5mm.
- Without colour trapping, the minimum line thickness should be .25mm.

Embossing

Sun Industries is able to emboss in the following styles:

- Pillow, Perimeter, Dome, Braille or Multiple Embossing within a keypad.
- Perimeter Embossing requires a minimum thickness of .7mm.
- Key to Key distances should be a minimum of 1.25mm.
- Embossing draft angles are a minimum of 3 degrees.

Die Cutting Tolerances

- Standard tolerances for the industry are +/- .20mm.
- Laser die cutting is available for short runs or prototypes.

- For tolerances less than .20mm Sun Industries can use steel tools with tolerances of +/- .10mm.

Membrane Switch

Material Options

- Polyester is the most commonly used switch material.

EMI/ESD/RFI Shielding

- Sun Industries uses printed conductive inks or Indium Tin Oxide (ITO) in membrane switch designs to minimise the impact of electromagnetic interference (EMI), electric static discharge (ESD) or radio frequency interference (RFI).

Conductive Traces

- Conductive Traces are generally Printed Silver or Etched, Plated Copper
- Traces usually have a minimum line thickness of .40mm
- Standard line thickness is .60mm

Tactile Feel

- Sun Industries uses a comprehensive range of stainless steel domes. Star domes are the most popular however our design team will provide advice on the type of domes best suited to your application.

Insulator

- Insulators vary in thickness from .125mm to .20mm and are generally polyester with double sided adhesive.

Rear Adhesive

- Adhesion qualities are linked to: Substrate surface energy, either high or low; types of materials; bonding requirements; environmental concerns and a number of other factors.
- Price and quality of adhesion can vary significantly. Sun Industries design team will discuss the best options for your particular needs.

Rigid Sub Panel

- Aluminium – Anodised, sealed, unsealed, dyed or un dyed.
- Acylic or Plastic Panel
- Cold Roll Steel – Plated with Chrome, Zinc or other plating.
- Stainless Steel – Brushed, Sanded or other finishes

Connectors

- Nicomatic - .100” pitch Male, Female and Solder Tab.
- Plating Tin or Gold
- Berg - .100” pitch Males, Female and Solder Tab.
- Plating Tin or Gold
- ZIF-Zero Insertion Force Connector

LED Layer

- Sun Industries provides integrated LED's into membrane switches.
- Overlay base material is usually clear with gloss or matte finish.
- Colours are printed on the reverse side of the overlay. The LED window area is generally clear or translucent allowing LED light transmission.
- LED's can either be surface mounted to the lower switch or a separate LED layer.

MEMBRANE SWITCH ELECTRICAL AND MECHANICAL SPECIFICATIONS

A: Electrical

1. Configuration – momentary SPST normally open
2. Current Rating – 30V – 100MA to 120V – 10MA maximum
3. Breakdown – 220V RMS
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