

A checklist for designing Custom Graphic Overlays.

Custom Graphic Overlays are integral for use in many industries, including industrial, medical, military and automotive, forming the protection or interface to an electronic device or system. A graphic overlay plays an essential role in defining the user experience and creates a powerful first impression for a company regarding product identity and branding.

GRAPHIC OVERLAYS

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The design of Custom Graphic Overlays is often critical to creating a new electronic system or device since it is the HMI (Human-Machine Interface) of the product that controls and indicates status. As a product designer, you must consider many factors about the product's application and use, with no two projects being the same.

Custom graphic overlays play an essential role in defining the end-users experience and create a powerful first impression for a company. The Overlay needs to be fit for purpose and withstand the desired working environment, while as the face of the product, the layout needs to be clear and intuitive.

Finally, this space has the potential for product branding that will reinforce and enhance your relationship with the end-user.

WHAT IS A GRAPHIC OVERLAY?



Environment

An HMI design or non-operational fascia must consider the environment that it will operate. The Custom Graphic Overlay that protects the device's face will play a significant part in the product's longevity. Internal and external applications offer completely different operational challenges, but there could also be grey areas between these two environments where a product needs to consider both settings for operation.

Indoor Environment:

- Components in an industrial setting may require protection from heat or impact.
- Display screens may be hard to read due to reflection and therefore need anti-glare lacquers.
- A device situated in a warehouse or production is more likely exposed to high levels of dirt and chemicals.

Outdoor Environment:

- Operation of a device in cold conditions may need tactile keys to help with a gloved hand.
- A product set in a public place may experience vandalism, requiring a protective finish.
- Control panels used in outdoor environments may need to be sealed, making the interface watertight. They may also need protection from UV light and extremes of temperatures.

Chemical

Industrial chemicals used for cleaning and manufacture may damage a printed graphic or surface material. However, reverse printing on a substrate and sealing the unit may offer protection to your HMI. The selection of more rugged substrate materials may also provide better resistance to some corrosive effects.

Sterile Touch

Clean environments may require an overlay with anti-microbial properties to inhibit bacterial growth. This protection is often essential in medical and scientific laboratories.

Lighting Conditions

Some sources of light may cause glare or legibility issues. These visual problems make an overlay more challenging to read. Unique varnishes and anti-glare materials can help maximise the legibility of a display.

- **Dim Ambient Lighting:** Will the device be situated in a dark room, requiring an internal light source.
- **Bright Ambient Lighting:** Will the device be located in a well-illuminated room, creating surface reflections.
- **Natural Lighting:** Will a product need to work in an environment with a changing light source or variable illumination.

Backlighting

Most graphic overlay materials are transparent or translucent. Being non-opaque adds the option of backlighting your HMI. Backlighting not only improves the look and appeal of your Overlay but also improves the legibility of status indicators in most lighting conditions.

Options include:

- EL and LED Driven lamps
- Acrylic Edge Lit Tiles
- LED driven Light Guide Film (LGF)

Abrasion

In some working conditions, an HMI may experience heavy operational wear and tear. Similar to the chemical exposure mentioned above, it may be necessary to use an overlay material that can withstand rugged use. At RH, we consider all the critical operational and environmental demands of the project. We then offer the best possible choices of materials and construction for your design to meet your unique project goals.

Will the surface experience:

- Impact
- Vibration
- Sudden movement
- Friction
- Heat
- Cold
- UV Light
- Moisture and Humidity
- Expansion due to temperature or pressure change

The Finish

Different surface finishes are possible through combinations of the substrate material and modern printing techniques. These protective and creative processes may add to the aesthetic value and the operational function of an interface.

Our Finishes include:

- Gloss/Matt
- Resin doming
- Non-glare
- Textured
- Patterned
- Metals (brushed aluminium, stainless steel)

For example, a brushed metal finish can be created by adding metallic ink behind a textured substrate material.

Print Effects

The combination of Digital and Screen printing on one product can produce effects that are otherwise unachievable elsewhere. Having the option for either process increases the possibility of creative graphics, including photo-quality imagery.

Effects include:

- Fades
- Gradients
- Transparencies
- Custom Spot Colours
- Photographic Imagery

Colour Selection

Your choice of colour for a custom graphic overlay is virtually unlimited. In combination with unique finishes and print effects, special colours can take on outstanding results. We have a vast library of custom colours, and we can also match client's bespoke colours to store in our ink library. We typically work with Pantone and RAL colour references matching colours in-house.

Colours including:

- Metallic (Silver, Gold, Copper, Brass)
- Pearlescent
- Fluorescent
- Neon
- Spot Varnishes

Profiling

It would be incorrect to assume that every Overlay has right-angle cuts. Many HMIs and printed fascias have bespoke shapes. We can create precision tooling to cut your graphic overlays to any shape or size. These in-house features offer the possibility for pin mounted registration and key cut holes for buttons, switches and LEDs to pass through the Overlay. We can even create a mounting plate in metal or rigid plastics with precision-tooled openings for your Overlays application.

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- XY Flat Bed Cutting Tool
- Production Die Cutting (Using forms or automatic tooling)
- CNC tight tolerance Hole punching

Embossing

Precision embossing adds both style and tactile response to your Custom Graphic Overlay. The operation of an HMI is enhanced by the sensation of raising keys and switches. This sensation considerably helps those working with gloved hands, including PPE, where the sensation of touch is greatly reduced, or finger location is critical.

- Perimeter embossing
- Pad/Pillow embossing
- Pseudo Tactile embossing
- Resin Doming
- Selective Resin Doming

Options: Embossing letters or logos for a decorative look can significantly enhance your product. Embossing symbols or shapes may also add to the user's experience and operation, such as Braille for the visually impaired or blind.

Note: RH embossed membrane keys are rated to 1 Million operations. We can run these product tests in-house if required.

Types of Custom Graphic Overlays

A graphic overlay has many different applications. We talk about membrane keypad construction as it is a common requirement from most of our customers. However, we have made overlays for many other uses.

These are some of the typical applications for Custom Graphic Overlays.

- Membrane Keypads and Membrane Switches.
- Protective Overlay: Over traditional mechanical switches.
- Key Frame Labels: A button or switch comes through an opening in the Overlay.
- Laminated panels: An overlay adheres to an engineered plastic or metal support panel.

- Indicator Panel: Where LED and backlit displays indicate status separate from control.
- Label Sets: Batched stickers and overlays supplied for hand application.
- Graphic Panels: Display information, branding or point of sale.
- (This is sometimes used in conjunction with touch products to add a permanent graphic layer over a capacitive touch switch.)

Many factors can shorten the life expectancy of a membrane keypad, and a protective Custom Graphic Overlay; light (UV), temperature, humidity and the physical surroundings all play their part. Ask RH to recommend the suitable material and construction to withstand your working requirements. Remember, we are always ready to help you with any aspect of your project.