



41 Suttons Lane
Piscataway, NJ 08854
800.580.6268
732.985.7815 ♦ 732.985.7816 fax
www.pei2000.com

TECHNICAL DESIGN CRITERIA RECESSES & POCKETS

For most enclosure applications, plastics has a distinct advantage over sheet metal in a number of basic areas; with one of those being the ability to incorporate pockets or recesses into the material sidewall. Yes, with a punch & die operation you can offset sheet metal surfaces to include pocketed areas, however, this means investing in a tool (punch & die set) for every different size recess. Additionally, you may also find yourself living with dimensional variations that could be functionally unacceptable and visually unattractive.

With a plastic enclosure, you can include recesses and pockets to handle functional details such as labels, overlays, or membrane switches. Additionally, the shape of the recess can be infinitely modified to add aesthetic features such as decorative lines or logo engravings. Furthermore, text or international emblems can be etched directly into the plastic providing a permanent 3D marking.

As with cutouts and openings, the primary design criteria that must be taken into consideration when designing for a recess pocket is the sharpness of the corner along the X,Y axis. With that in mind, the smallest diameter cutting tool that we can use to economically cut plastic material is .039". This means that for applications where the recess or pocket requires extremely square inside corners, the sharpest we can cut the corners is .019".

From a practical perspective, our experience has been that very few customers design their labels, overlays, or membrane switches to such a tight tolerance that they must have perfectly sharp corners. For the most part, few label or overlay suppliers will guarantee perfectly square, punched or stamped corners due to the eventual wear of their tools. Furthermore, even fewer assemblers have the ability to place a self-adhesive label or similar item inside of a pocket when corners are perfectly square and tolerances are tighter than what PEI can provide. Finally, our experience is that any item that would be placed into such a pocket would, itself, be manufactured to a wider tolerance than what our process can provide. The bottom line being that if you are designing an enclosure that requires perfectly square inside corners, then you may be looking at higher costs, greater reject rates, and longer leadtimes from PEI as well as your other component suppliers.

Beyond the location and squareness (X,Y dimension) of the pocket, the other measurement that must be addressed is the depth or Z dimension. For PEI, many of the features we cut into the plastic panels rely on our CNC machines to accurately control the depth (Z movement) which we can do to within a few thousandths of an inch. This allows us to locate components, PCB's, connectors, and other items precisely where they are needed. As an example, the location of standoffs used for fastening PCB's can be accurately located in order to align them with a side wall opening or other component. This is crucial when locating board-mounted components that must protrude through an outside wall.

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