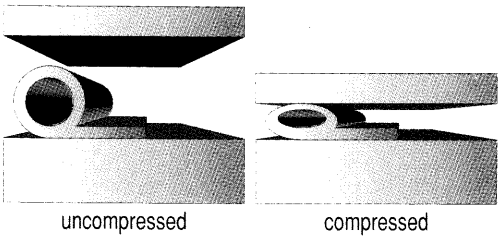
ELPACTO® RFI/EMI Shielding & ESD Grounding DESIGN GUIDLINES

ELSHIELD® shielding and grounding products provide one of the finest performance alternatives available. Proper installation, however, is a necessary consideration to take full advantage of the advanced mechanical and electrical properties of these components.

Because of the tight confines of applications requiring micro-gaskets, a few simple guidelines are suggested to assure both static and dynamic performance characteristics are nominally achieved.

1. CROSS SECTIONAL WIDTH



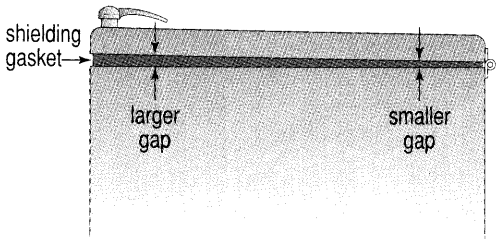
a.) **Match gasket's overall cross-sectional width in the compressed state** to the available width of the contact surface mounting area.

b.) **Verify that adequate electrical contact surface area is available** on both top and bottom of the gasket between the mating planes.

c.) **If the gasket is too large,** try a smaller size. If too small, try a larger size. Many choices are available for each product profile.

d.) **Excellent environmental sealing of openings is possible** due to the flexible silicone rubber material, preventing moisture and contaminants from entering.

2. COMPRESSION RANGE



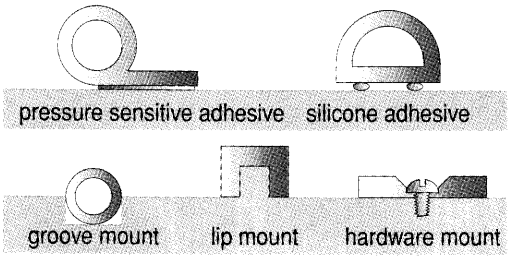
a.) **Assure positive contact engagement** between the mating surfaces along their length.

b.) **Take into account the largest amount of variation,** since the gap between mating panels may vary along their length.

c.) **Allow at least 15% compression** versus the uncompressed relaxed gasket height for adequate surface contact.

d.) **Where vibration dampening is a concern,** the resiliency of the gasket material offers a variety of solutions without other extra components.

3. ATTACHMENT

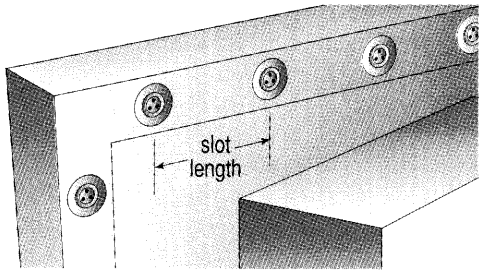


a.) **Select the gasket profile** which will accommodate your preferred attachment method.

b.) **The most common alternatives are:**

Pressure sensitive adhesive	- adhesive only partially covers underside to allow electrical contact with surface
Silicone adhesive	- applied during installation
Press-fit into a groove	- groove size recommended is 10% less than gasket width for tight fit
Press-fit over a lip	- lip size recommended is 5% more than internal opening of U-channel type gaskets
Hardware attachment	- screw, rivet

4. SHIELDING EFFECTIVENESS



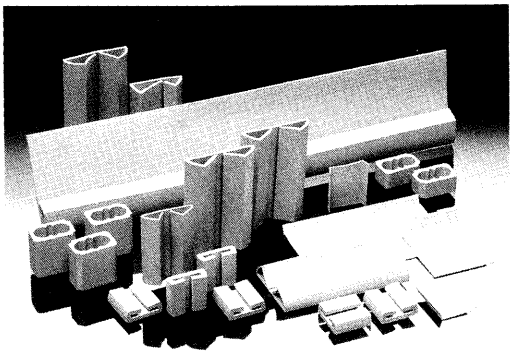
a.) **Use continuous strips** of gasketing material along the full length of the mating surfaces whenever possible

b.) **If a discontinuation in the contact between mating surfaces is necessary** (i.e. to allow for hinges, fasteners, etc.) refer to page 11 chart entitled "Shielding Effectiveness vs. frequency as a function of Slot Length". Determine if the space remaining free of gasket contact is still adequate to contain the radio frequencies at the desired level of shielding effectiveness.

c.) **Consider using just points of contact** at the recommended "slot length". This method may be preferred in order to reduce the amount of compression force required to more easily close the mating panels upon one another; i.e. for an enclosure door. **ELPACTO**® Pop-up contacts (shown in the drawing at left and on page 12) may be useful in this case, or shorter sections of the otherwise full-length gaskets may be possible.

ELPACTO®

Thermal Management DESIGN GUIDLINES

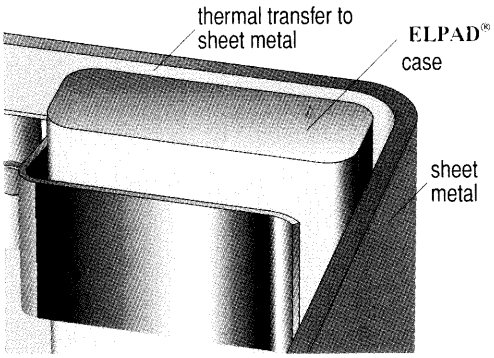


ELPAD®'s versatility in thermal management applications is doubly enhanced by way of the variety of end-use configurations possible, and the many standard material formulations available in each.

The silicone rubber based materials offer other useful elements such as electrical insulation, protective coverings and gasketing as integral features in most designs.

Along with a few simple recommendations to help in obtaining the optimum performance for your application, a few suggestions are included which may help you to take advantage of some of these other features.

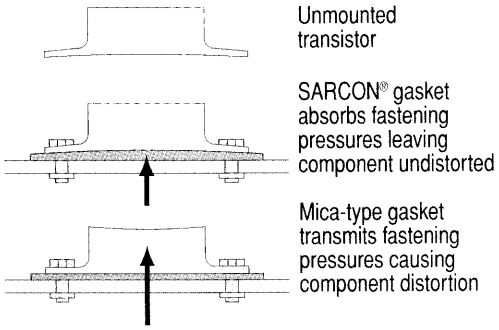
1. THERMAL TRANSFER



a.) **Consider the most efficient ELPAD® materials regarding thermal conductivity.**

b.) **Take advantage of the heat transfer characteristics** of any nearby sheet metal components by using the ELPAD® component as a thermally conductive bridge from the heat generating component to the sheet metal. See drawing at left.

2. DUAL FUNCTIONALITY



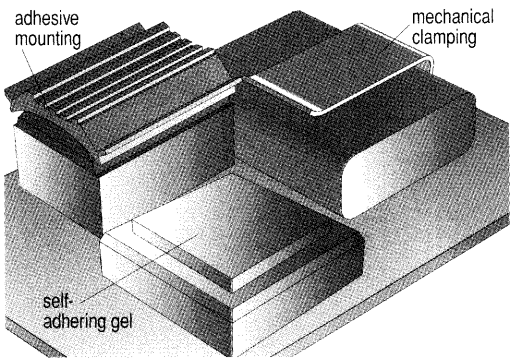
a.) **Use the ELPAD® component also as a functional gasket,** seal cushion, insulator or protective cover. See sketch at left for seal cushion application

b.) **Vibration dampening and environmental sealing** against outside contaminants can be included in the design elements.

c.) **Choose from many related product configurations** shown on pages 9 to 13

d.) **Custom shapes** can be arranged if your design requires a specific treatment

3. ATTACHMENT



a.) **No special preparations** are necessary to attach the ELPAD® component

b.) **Some of the most common alternatives include:**
pressure sensitive adhesive
silicone adhesive
mechanical clamping
hardware attachment - screws, rivets
self-adhering silicone gel

c.) **Consider using the self-adhering ELGEL® GR Gel** shown on page 54 of the catalog product section.

d.) **Note also that ELPAD® is very elastic,** providing a very tight fit over uneven surfaces. This eliminates the need for gap-filling agents in order to achieve high rates of thermal dissipation without variation. The sleeves and cases shown on page 13 of the catalog can be designed as an interference fit which can slip snugly over appropriately configured components.