Pressure Pads for Bonding Gages to Contoured Surfaces

A number of Micro-Measurements adhesives, including the popular M-Bond AE-10/15 epoxy-based system, require the uniform application of pressure during curing. For flat surfaces, silicone rubber pads, such as Vishay Micro-Measurements SGP-1 or -2, can be used in conjunction with a metal back-up plate and some vehicle for load application (dead weight, spring clamps, etc.). With a little more effort, the same approach can sometimes be used on simple curved surfaces (cylinders, pipes, etc.) if the radius of curvature is sufficiently large.

But when surfaces have steep or compound curvatures (like the pipe elbow shown above), custom-shaped conformal pads are usually required to distribute the applied load in a uniform fashion.

PRESSURE PADS

Procedures

Form a back-up plate, slightly larger than the gage matrix, to the approximate shape of the surface to be gaged.

Squeeze out RTV-3145 into a small metal or plastic cup. The quantity should be sufficient to cover the gaging area to a thickness of about 0.2 in (5mm). Add several drops of water to the RTV silicone rubber and mix thoroughly. Apply the mixture to the uncleaned surface (to make removal easier after cure).

Press the backup plate in place, leaving a minimum thickness of at least 0.1 in (2.5mm).

Cure will take about 24 hours. Remove the contour-pad/plate assembly from the surface and trim any excess rubber from the plate to complete the fabrication process.

Use the pad while following standard gage installation procedures. These pads can withstand adhesive cure schedules of at least 350°F (175°C).

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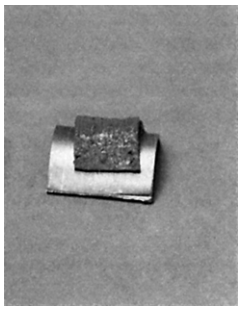

Water should NEVER be added to RTV silicone rubbers used as protective coatings! In addition to the creation of an excess number of voids during mixing, the quality of the bond between substrate and coating is substantially reduced when water is added. While that effect is desirable when fabricating a conformal pressure pad, just the opposite is needed in a protective coating.