Materials Technology

Sealing GORE™ Membranes to Plastic Parts

A variety of methods can be used to seal laminated GORE™ Membranes to plastic parts, including: heat sealing, ultrasonic welding, RF (radio frequency) welding, clamping, insert molding and adhesives. This paper describes two common sealing methods.

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Heat Sealing Guidelines

Heat should be applied to the membrane side of the laminate. Since ePTFE has a very high melting point (327°C, 620°F), the support material and/or the housing material needs to be melted into the ePTFE microstructure. The ePTFE membrane will not stick to the seal die, so typically no additional nonstick materials are needed. If the reverse orientation of the laminate is desired, a high-temperature, nonstick material on the heat seal die or release liner will prevent the support material from sticking to the die.

- If the heat seal die contacts the edge of the part, the support material may stick to the die, so a nonstick material on the die or release liner may be needed.
- Optimal sealing temperature depends on the membrane, membrane support material and housing material.
- A minimum seal land width of 1.25mm (0.05”) is recommended.
- An integral seal appears as a solid, transparent area.
- A flat surface is most desirable.
- Methods of testing the seal integrity can include using pressurized water or measuring air flow.

Ultrasonic Welding Guidelines

Heat in ultrasonic welding is created by high frequency sound energy delivered by an acoustic tool, known as a horn. The energy is directed toward the desired location for melting the membrane support and/or housing material.

- Excess vibration should be avoided.
- High frequency, low amplitude settings are preferred (40kHz).
- Part design is critical to a good seal.
- The part should be held firmly during sealing so that all vibratory energy is directed to the seal area.
- If the part design allows it, a more reliable seal is accomplished when the laminate is sandwiched between two plastic parts, rather than when the horn comes in direct contact with the laminate.
- If the horn is coming in direct contact with the laminate during sealing, using the pre-trigger may achieve a better seal.
- Optimal ultrasonic welding conditions depend on the membrane, membrane support material and housing material.

Please contact Gore for help with your particular application.

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