

Indium For Sealing

Due to its softness, indium is an ideal material to create a compression seal. It remains malleable and ductile even at cryogenic temperatures. Alloys containing high amounts of indium are sometimes used, but the addition of another element such as Pb, Sn, or Ag reduces indium's ability to compress and form an adequate seal.

Indium wires and preforms are the most popular forms used to create a compression seal. Regardless of the form, it is advisable to prepare the indium prior to creating the seal. This is accomplished by degreasing the indium using acetone or other suitable organic solvents. This will remove any organic contaminants that may be on the surface.

Indium is self-passivating and forms 80-100 angstroms of oxide on its surface. It is best to remove the oxide because if it gets compressed into the seal, it may be a source for leakage. This oxide can be easily removed by soaking the indium in 5-10% HCl (by volume) for 1 minute, followed by two thorough rinses in DI water. The indium should then be given a thorough rinse in acetone or suitable organic solvent and blown-dry with dry nitrogen. The oxide will reform in approximately 2-4 hours, so etch only enough indium to be used within that time frame.

The amount of pressure required to create the indium seal depends on the application. Due to the fragile nature of some parts, only minimum pressure can be used. A gentle warming of the joint will make it more compressible and allow for less pressure to be used. Use heat only when absolutely necessary because oxides will readily reform on the indium surface.

A NOTE OF CAUTION: Do not allow the freshly etched indium parts to come in contact with one another because they will cold weld to each other (sticks like contact cement).

APPLICATION NOTE

This application note is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

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