



**IJ Research, Inc.**

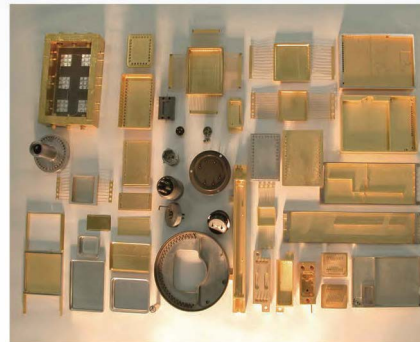
ISO 9001:2000 registered. Established in 1988.

## GLASS TO METAL SEAL



IJ Research uses both match and compression seals. IJ Research produces feed through based on Kovar flange and Kovar pin match seals as well as the compression seal of the combination of stainless steel housing with Alloy 52 pin. For opto-electronic windows, we use borosilicate glass as window or lens in Kovar flange. In match seal, there will be a direct fusion of glass to metal for hermeticity. In the compression seal, there will be predominantly a radial thermo-mechanical induced compression force and often sufficient for a required hermeticity

Besides these routine match and compression glass to metal seals, IJ Research services challenging seals using others than the commercial sealing glass products.



For the product line of opto-electronic window or lens assemblies, we use sapphire, optical spinel, diamond, optical filter glass and a few others in various different metal flanges. IJ Research uses sealing glasses either from market place or from our stock. We formulate and produce specialty glasses for various seal applications that may be different from the routine match and compression sealed assemblies. Some of them are listed below. For sealing glass what IJ Research offers in specialty sealing, please refer to our corporate literature called Sealing Glass List.



The Sealing Glass List as shown in a Corporate Literature contains some of the glasses IJ Research formulated or IJ Research modified commercially available glasses. Many of them can still be used as either a match sealing or as a compressions sealing concept depending on how we utilize them.

IJ Research has its capability of sealing metal and glass together regardless it is for electrical feed through or opto-electronic window application. If there is a lack of materials to choose from, IJ Research may formulate one your need.

For the specialty glass matter, IJ Research is unique. We strongly believe that IJ Research might be the only one company or one of very few companies in the country who can formulate or are interested in formulating a sealing glass per a specific need. Some examples the company has experienced in the formulation past listed as follows:

# GLASS TO METAL SEAL

- a. Glass sealing silica and silica
- b. Glass sealing optical fiber and fiber mount
- c. Glass coating over Cu, Al, SST, etc.
- d. Glass sealing at lower temperature to prevent heat exposure damage on other components
- e. Application temperature can be higher than sealing temperature. It is based on nucleation and crystallization.

- f. Glass coating on Al usable at sudden heat exposure without cracking or crazing
- g. Glass coating OD as well as ID of a tube of virtually all metals and alloys.

IJ Research may offer a solution on both materials and processing for your need of either glass sealing.

IJ Research is also a source for your need of dielectric coating over your metal or alloy. If your substrate needs to have a vitreous coating over a ceramic, IJ Research also may help you on the glazing service. Again, we may be able take care of both the selection of the glazing material and the glazing process. Many of the sealing material are for coating as well but as requires, we may be able to formulate one for the specific need

## Electrical feed through or micro-electronic package:

### Housing

Ni/Fe/Co alloy  
SST or steel  
Ni/Fe alloy  
Ti  
SST 300 series  
W, Mo  
Inconel  
Ceramic  
Glass  
SST 15-5PH  
Al  
Cu

### Glass

Corning 7056, 7052  
Corning 9010/9013  
IJR glass  
IJR glass  
IJR glass  
IJR glass  
IJR glass  
IJR glass  
IJR glass  
IJR devitrifying glass  
IJR glass  
IJR glass

### Conductor

Ni/Fe/Co alloy  
Ni/Fe alloy  
Ni/Fe/Co alloy  
Ni/Fe alloy, Ti, Pt, Ta, etc.  
Inconel, SST, etc.  
W, Mo, graphite  
Inconel, Ni, steel, etc.  
Ni/Fe/Co or Ni/Fe alloy, etc.  
Ni/Fe/Co alloy, etc.  
Ceramic  
Cu  
Cu, SST 300 series

# GLASS TO METAL SEAL

## Electrical feed through or micro-electronic package:

Housing	Glass Window or Tubing	IJR Glass to be used
Ni/Fe/Co alloy	Corning 7056	None in-between
Si	Corning 7740	None in-between
SST 300 series	Corning 7740	None in-between
Cu	Corning 7740	None in-between
Ni/Fe alloy	IJR glass	None in-between
Alumina or Sapphire	Alumina, sapphire, spinel	IJR glass in-between
Mo or W	IJR glass	None in-between

**Note:** In this table, Ni/Fe/Co alloy refers to Kovar and Ni/Fe alloy refers to Alloy 52.