



ISO 9001:2000 registered. Established in 1988.

# T H I N F I L M S

Both metallic and non-metallic coatings are available from IJ Research. We use both physical masking and photolithographic techniques for patterning. Both PVD and CVD are available and depending



on the application, we select a proper technique unless one is specified. Our PVD includes RF, DC magnetron and vacuum evaporation. Our analytical capabilities include surface profilometer, XRF, SEM, TEM, metallurgical microscopes, XRD, etc.

## Optical Windows and Lenses:

We offer various optical microwave windows and lenses such as alumina, sapphire, glasses, and exotic crystals. These windows are available with or without optical coatings. Of many of the optical window materials, the sapphire is the one we use most and we are a leading sapphire window brazing company in the U.S.



## Substrates:

Most common substrates are  $Al_2O_3$ , sapphire, borosilicate glasses, quartz and silica glass. We also use  $AlN$ ,  $BeO$ ,  $SiC$ ,  $Si_3N_4$ ,  $YSZ$  and others.

## Metallization, Insulation, Semi-Conductive and Anti-Reflective Coatings:

We routinely use  $Cr/Ni/Au$ ,  $Ti-W/Ni/Au$ ,  $Ti/Pt/Au$ , nitrides, carbides,  $SiO_2$ ,  $Al_2O_3$ ,  $Cu$ ,  $Pt$ ,  $Nb$ ,  $Ta_2O_5$ ,  $WO_3$ , polymers, and A/R coatings for UV, visible and IR. Many coatings withstand high temperature exposure with no coating degradation. Our  $TiN$  coatings are available in two types; one is dense gold like appearance and the other has a columnar structure.  $TiN$  is brown in color. The loosely bonded biocompatible  $TiN$  is primarily for biomedical use. The metallization

around the C/A of windows or lenses is for subsequent brazing with metal housings. The housing can be metal or ceramic. IJ Research has the capability of coating and metallizing on ball lenses.

## Metal or Ceramic Housing (Flange or Cap) for Hermetic Opto-Electronic Packages:

The most common materials are  $Ni/Fe/Co$ ,  $Ti$ ,  $Ti$  alloys and  $SST$ . Others include glasses within glass housings, clear spinel, sapphire in alumina, and  $AlN$  housings.

An inorganic and vacuum compatible matte black finish coating on any metal or its alloy is available. This involves a special technique of glass or ceramic anodizing. IJ Research offers anodizing on not only on aluminum, but also many other metals or alloys in addition to glass or ceramic.

## Subassembly of Lenses or Windows with Housing as Listed Below:

- Glass lenses or windows with various metal or alloy caps and flanges.
- Brazing and soldering of windows with A/R and/or ITO coatings.
- Sealing of A/R coated sapphire windows with high alumina (polycrystalline) housings for high temperature and high pressure applications.
- FEA of hermetic seals.
- In-depth knowledge on the subject. IJR has volume production capacity.
- Brazing and soldering of windows as small as 2 mm in diameter for hermetically sealed applications. The integrity of the A/R coating is maintained even at high brazing temperatures up to 1000°C.

Many of the windows and lenses from IJ Research will meet the customer's stringent optical quality requirements. *For example:* Biocompatibility or autoclavability (for approximately 10,000 cycles), hermeticity ( $10^{-10}$  std. He cc/sec at 1 atm. diff.) during temperatures as low as -300°C and as high as approximately +1,000°C.

*Please contact the Applications Engineering Department for any questions you might have. We will gladly answer any of your questions.*