

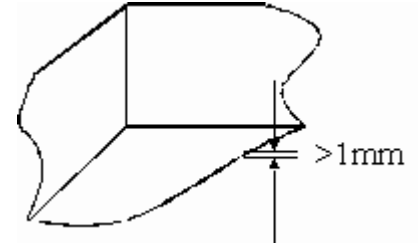
# Design Guidelines for Osprey CE7 and CE9 Alloys

While Osprey CE7 and CE9 alloys exhibit attractive properties, i.e. low CTE, low density, high specific stiffness, thermal stability, flatness and high thermal conductivity, they are relatively brittle. Therefore, the design features of electronic packaging components, and the machining parameters used, must be carefully considered to achieve optimum results.

## Design of Packages

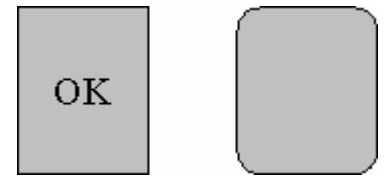
### Wall/base thickness

- Generally >1mm thickness is recommended, although thinner walls can be incorporated with careful machining and provided that the wall height is <5mm



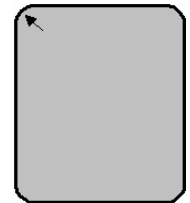
### External radii

- External radii are generally not required (although they can be machined with ease) and will add to cost, because 'starting' blocks are normally cut with square sides; parts can be chamfered if necessary



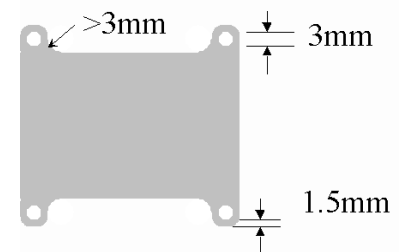
### Internal radii

- Large radii are desirable (e.g. 0.5 to 0.75mm or greater) in order to minimize use of small, expensive end mills



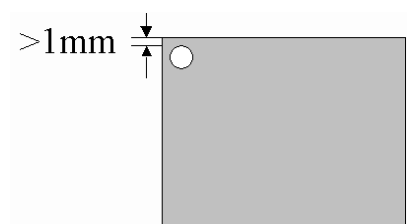
### External tags

- Minimise use of hold-down tags if possible. However, if tags are necessary, ensure that they are reasonably thick (>1mm), that they have large internal radii (typically >=3 mm) and are at least 3mm wider than the holes in the tags.



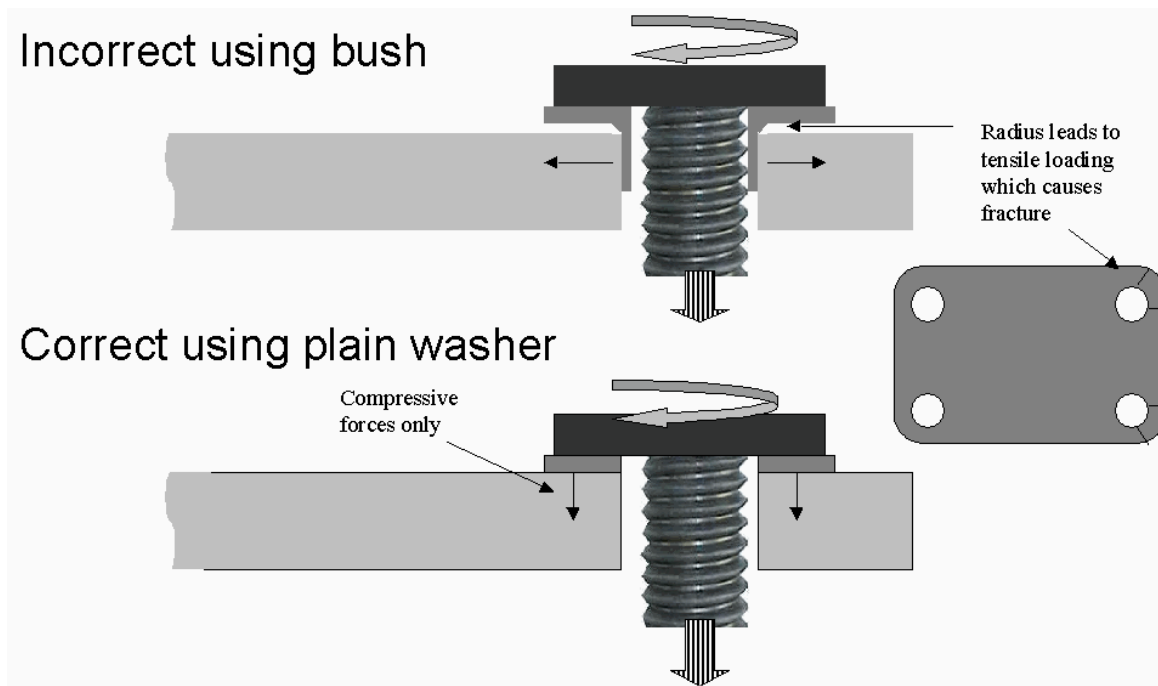
### Drilled holes

- Avoid holes very close to the side walls of the package and to the edges of the tags or plates; e.g. allow at least 1mm wall surrounding the hole



## Tapped holes

- Any tapping must be carried out carefully and preferably using carbide taps in a CNC machine. Threaded holes down to 1.8mm diameter (UNC 256) have been achieved but may add significantly to the production cost. Thread milling is a useful technique if the holes are large enough.
- All holes can use inserts (e.g. Helicoils)
- EDM tapping can also be used. This technique is most useful for small blind tapped holes.
- Drill using spiral milling technique or EDM.
- Bolt down of plates  
Better to use plain washer rather than bush. (See Below)



## General

- Other than above, use normal design rules for CNC machining components.