

# Drawing Guide

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## How to prepare your drawing and upload the Materials Direct

Note: All drawings have to be correctly scaled 1:1 for our machines to be able to produce the correct parts for you.

### Option 1

If you have a drawing of the your desired custom part ready to go simply make a 1:1 .pdf copy of the part without dimension lines together with a reference copy Which HAS dimension lines for us to check what we are making is the size you want... Send as 1 .pdf file.

### Option 2

Send us a dimensioned .pdf drawing and we will remove the dimension lines for you and use it to create the part. This option has an additional administration fee.

Help in designing a gasket or interface part.

1. Draw the outline of the part and know the x and y dimension first. Decide which are the most important things about your pad or gasket that are going to be designed and do them second. For instance, hole to hole positions might be more important than the overall size of the pad.

Select a single hole as the datum and make all of your further hole dimensions reference the datum hole. Don't forget to dimension the datum hole to the edge in x and y dimension to locate the pad edges.

2. Is the overall size important? if not, then If you are designing a thermal interface you may wish to oversize it so you can see it is "in place" once the 2 items are mated together. I.e. A tag is expensive (as it uses a lot of material) but over hanging a little on one or more sides may be a good idea (Otherwise you may not know if it's been fitted in production if it can't be seen).
3. If the holes are 2 close to the edges of the part there is a risk of the web breaking when we are cutting it. The absolute minimum web width for most thin materials is 2mm but of course the thicker the material the wider the web should be. As a general rule try to make the web width dimension at least the thickness of the material. If your holes are really close to the edges or other holes in the part please convert them to slots to avoid breaking webs.
4. Try to open up all tolerances as much as possible. Don't forget the parts are generally fabric and therefore have wide tolerances. Particularly in the case of gap filling pads and the like. Opening tolerances will make the parts easier to make and therefore less costly to produce and you will save money.
5. The minimum radius is 0.5mm on any corner inside or outside.

6. Tolerances on thicknesses are normally  $\pm 10\%$  unless the manufacturer states otherwise.
7. Tolerances on material overall x y dimensions are typically  $\pm 0.3\text{mm}$ . Dimensions hole to hole are typically  $\pm 0.25\text{mm}$ . Not forgetting these materials are often elastomeric and or fabrics so dimensions vary due to the nature of the material.
8. If the material has adhesive applied on one side please denote which side it is to be applied.
9. If you are designing for a gap filling application then have somewhere for the gap filling pads to squash out too. The material does NOT compress as many manufacturers incorrectly state. They should say deflection not compression as there is no gas in the material. In other words allow for sideways movement of the material as it squashes out the sides!
10. Gap filling materials work as long as the material has made good contact with both surfaces you are try to thermally connect. It doesn't normally need to be deflected to any particular % of its original thickness to make it work but as a good rule of thumb try to not go beyond 30-50% of its original thickness. The materials have a compression set of about 66%. This means the Visco-elastic nature of the materials mean it won't come back to its original thickness if deflected this much. Also you risk applying too much pressure to the surfaces if deflection is great. Some Gap-filling materials are extremely soft as well as thermally conductive so look at the shore hardness when designing your pad.
11. We will manufacture the parts in the most efficient way for you. If you have a specific requirement as to how you want the material presented it is best to use the services of the parent Company Universal Science to determine your special requirements or put a note on the order and we will try to accommodate you.
12. If you wish us to stock a new material for you to buy then please contact Materials Direct and let us know and we will be happy to help.

Finally, these notes are for guidance only. No warranty claims or failures in any application arising from using these guidelines will be accepted by Materials Direct or its parent Company Universal Science. See Terms and Conditions for more information.