



Producing a manufacturing specification

Before undertaking any making, a complete manufacturing specification should be produced. This should be a document to guide the manufacturers on how to produce the engineered product, as well as providing specification points that must be met during, and at the end of manufacture.

Parts of the information may already be given on sections of drawings from sketch sheets and testing outcomes however, the manufacturing specification pulls all of this information together into a concise document, making it easier to find key information. For example:

Materials information should be included to inform the manufacturer what materials each part should be made from. This may include stock material as well as any additional details about quality, etc.

Technical details should include details of any components used as well as specific tolerances linked to finished parts. This section should also identify bought in parts such as fixings, hinges, brackets, etc.

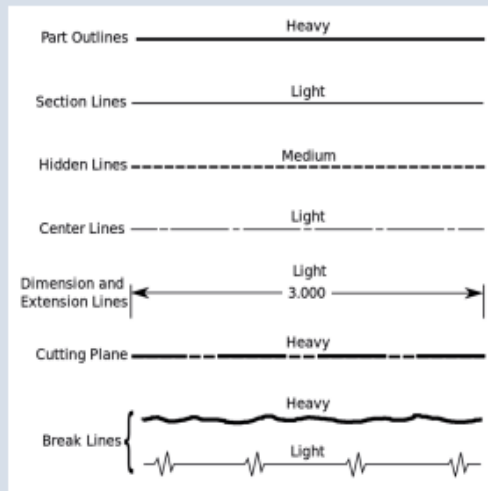
Finishing details focuses on the type of finish applied to each manufactured part, these could be machine finishes such as knurling or polishing or applied finish such as anodising or spray painting. Other finishes, such as printing or spark eroding, could also be covered here.

Drawing an engineering design to standards

Engineering drawings are used to provide all of the details for items to be manufactured in all areas of design and engineering.

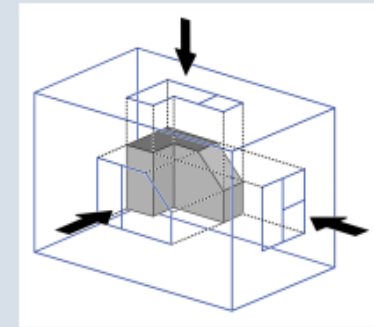
Engineering drawings must follow a set of conventions laid out by **British standards** and these dictate the way that the drawings should be laid out, dimensioned, what scales should be used as well as the types of lines to be used to depict certain views and actions.

In the United Kingdom, designers and engineers use the **third angle projection** method to layout their information on plans and drawings. Drawings undertaken using traditional drawing boards must follow the same conventions as those drawn on CAD (computer aided design) using PC's.



Line weights in engineering drawings also follow British standards and should again be used in traditional and CAD work.

Isometric drawings should be used to illustrate an accurate three-dimensional representation of the part of product. Lines are set up on 30° angles using an isometric grid.



Associate symbols on drawings, including:

- Dimensions and associated symbols:
 - o **diameter**: the size of a line that runs from one side of a circle, through the centre to the opposite side
 - o **circumference**: the perimeter of a circle or ellipse
 - o **radius**: half of the diameter
 - o **height, depth and width**.
- **Conventions**, such as:
 - o **title block**: gives additional information on a drawing such as scale, name and title
 - o **dimension lines**: the actual sizes on an engineering drawing
 - o **extension lines**: continue or extend from the surface of the object and establish the size of the dimension
 - o **centre lines**: show the exact centre of a circle or arc
 - o **metric**: units of measurements to be used.