



## Planning manufacture

Before any manufacturing can take place, a plan is needed to determine each stage or step of the process.

The plan should include:

- the materials to be used to produce the engineered product
- what equipment will need to be used
- what tools will be needed
- the sequence (order) that manufacturing needs to take place in.

The sequences need to consider in what order parts are manufactured, as some parts require others to be made to ensure they join correctly, etc. This is also known as prioritising.

## Equipment selection

Equipment should be classed as any powered machinery that will be used in the production of an engineered outcome.

Equipment choices should give justifications for their selection and should refer to engineering drawings or other provided sources.

Typical equipment may include:

- centre lathe
- drills
- miller
- laser cutter
- bandsaw
- linisher
- brazing hearth
- buffer/polisher.

## Tool selection

Tools should be classed as any hand tools that will be used in the production of an engineered outcome. These should also include marking and measuring tools.

Tool choices should be justified in the planning stages to explain why they were selected.

These include:

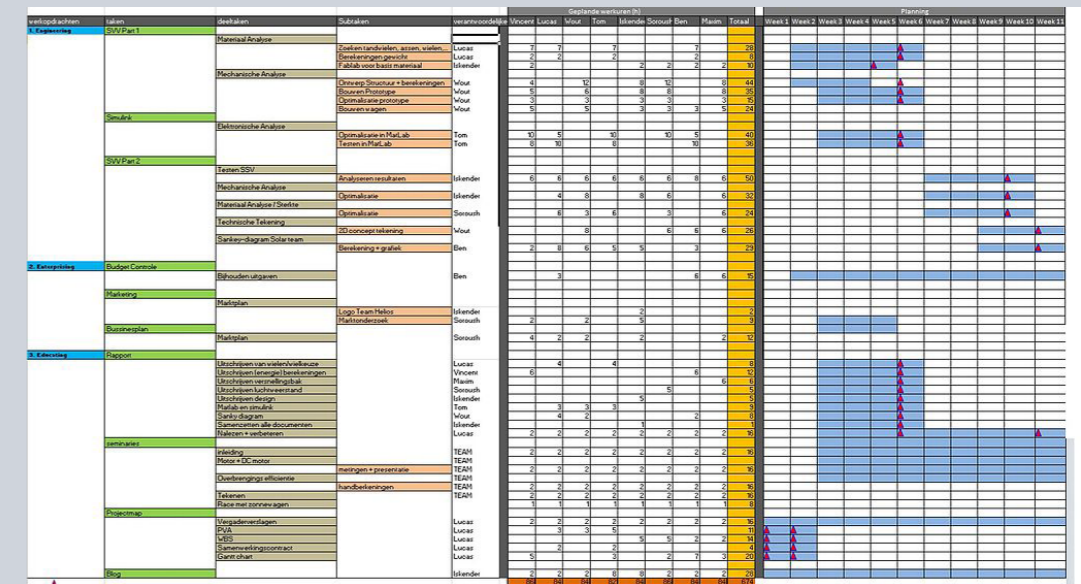
- scriber
- centre punch
- standard, internal, external and odd leg callipers
- soldering iron
- steel rule
- engineer's square
- file
- dividers
- micrometre
- vernier callipers
- rivet sets
- taps and dies
- hacksaw
- fretsaw
- pliers
- screwdriver.

## Planning and sequencing

Plans for manufacture should be presented in a way which is easy to find key information at a glance. Planning information could include tables such as a GANTT chart or other lists or appropriate documents.

Manufacturers should be able to understand from the provided information, the sequence of manufacture and the time it should take to produce the part, which tools and equipment should be required for each stage and any processes such as the use of jigs or templates.

Planning and sequencing should also consider the use of CAM (where appropriate), including 3D printing and laser cutting.



Typical engineering GANTT chart

### Contingency planning

Planning should also include contingencies to overcome problems that may arise during production. What happens if a machine breaks down or people become ill?

Contingency planning should include ways that problems can be overcome, giving examples of scenarios and possible contingencies.