

The advantages of using CAD in laser and manufacturing

Computer-aided design (CAD) dates back to the 1960s and has pretty much replaced manual design. However, initial ideas are still generated on the back of an envelope. In this blog, we explore the advantages of using CAD in laser and manufacturing.

CAD encourages end-to-end precision. It improves the quality and level of detail and streamlining of the designer's workflow. It's also invaluable in demonstrating different sections of a project. For example, we might be manufacturing and installing an access platform in a warehouse, therefore, the CAD drawing can show the 'bigger picture' such as the position of pipework. Also, the CAD file guides the manufacturing process such as bending and [CNC laser cutting](#).

What is computer aided design?

CAD enables engineers, architects and manufacturer to create, review and modify the design of a product. It can significantly improve the quality of design, facilitate collaboration, increase productivity and enable a library of designs to be set up.

CAD is a method of representing designs as 2D and 3D simulations ready for production. Accuracy and agility are the main advantages of using CAD in manufacturing and production.

Why use CAD?

CAD can make even the most difficult drawing easy to understand. Designers are able to play around with their product, work with plan, elevation and side views, as well as slices and sections. It also makes it easier for non-technical people to visualise the final product and all its constituent parts.

Other uses of CAD include digital representations of a new product for marketing and sales purposes. It also means departments, at the latter end of the whole product development process, can start working while the design is in the final stages of

approval.

Benefits of CAD in manufacturing

We consider there are four main benefits of using CAD:

1. Improves quality of design
2. Improves productivity
3. Enables collaboration and information sharing
4. Reduces errors

Improves quality of design

Good design helps improve the various manufacturing and production process a product will go through. CAD plays a big part in this by helping engineers and architects visualise the various stages and how best to optimise them. This includes [prototyping](#) to test overall product performance.

Improves productivity

The time it takes to bring a product to market is critical to its success. With CAD, an engineer can create complex parts, and be sure that any changes can be made relatively quickly. New models can be created using existing designs, adding and subtracting features as required. It means smaller teams can create premium, affordable products. The addition of animation enables designers and product managers to see how the product will work in the real world, moving and interacting with other components.

Enables collaboration and information sharing

Cloud-based CAD makes collaboration and information sharing really easy, for example:

- It encourages better understanding at board and [assembly](#) line level of the vision and scope of work required in terms of time and materials.

- Communication with the supply chain allows issues to be addressed, thereby speeding up the process.
- Involving customers at every step of the way leads to their greater satisfaction which, in turn, is great for relationship-building.
- Access to CAD designs greatly benefits the marketing function, especially at the planning stage, making final communication to the target audience much more effective.

Reduces errors

One of major benefits of CAD is the reduction in errors:

- Automation reduces human error through 'input once' practices, and auto correction (eg conflicting measurements).
- Accurate [prototyping](#) is pretty much built-in through automatic simulation and visualisation.
- The 'change once' principle means a single amendment can be made. The software will then automatically make the necessary adjustments elsewhere, thereby removing the need for individual changes.

Pros and cons of CAD

So to recap, the advantages of CAD lie in 'speed to market,' through:

- The ability to represent even the most complex designs
- Easy editing, modification and replication of drawings
- Automation leading to improved accuracy
- Effective visualisation of the finished product
- Collaboration through accessible cloud file-sharing
- Positive effect on the business, both in terms of sales and staff development

The disadvantages of using CAD are minimal but worth bearing in mind:

- Work can be lost if files aren't efficiently backed up
- Cyber security is necessary to avoid viruses and hacking
- CAD systems are expensive so budgeting is important. Also allowing for upgrades
- Proper training is necessary to get the best out of CAD

- Going from manual design development to CAD will result in organisational changes for the business

How to Implement CAD

It's important to organise and plan how CAD will fit into your business. Here are some considerations:

- What kind of CAD system do you need?
- When do you need it to be up and running?
- How do you plan to integrate CAD into the rest of your business?
- What kind of processes will you put in place to manage and develop your CAD usage?
- How many users will you have? Is subscription or pay-as-you-go the best option for you?
- Where's the best place to locate your CAD workstations?
- Do you need to accommodate remote working?
- Will you recruit relevant staff or train existing employees?

Conclusion

Like all forms of automation, CAD represents an incredible benefit for design and manufacturing in terms of speed and precision with ROI measurable in terms of straightforward productivity. We're always happy to discuss a customer's sheet metal designs and how we can use CAD to bring them to life.