HOW TO PICK THE BEST MATERIALS FOR YOUR PROJECT

CNC machining is a complex process that requires careful consideration of the final project parameters and the materials being used. Different metals and polymers require different tools and techniques to achieve the best results, which can have an impact on both your project costs and timescale, and the quality of the finished components. With this in mind, it is essential to understand *how* to pick the best material for the application.

GET IN TOUCH

We've previously covered the types of materials commonly used within CNC machining in an article you can read here. In this article, we'll take a closer look at some of the factors you should consider when making an informed decision.

Machine Compatibility And Operating Conditions

The most crucial factor when selecting your material is whether or not it is compatible with your project parameters and the specific machines and processes within your planned machining sequence. Depending on your requirements, you may need to use multiple types of tools or machinery, so be sure to consider all factors before making any decisions relating to your bill of materials. Different materials may also require different operating conditions; for example, aluminium requires a high cutting speed but a low feed rate, while steel requires a slower cutting speed coupled with a high feed.

CNC machining is extremely versatile and can deliver excellent results with a wide range of materials. However, fully considering the application, machine compatibility and operating conditions can help you determine which material will be best suited for your needs, and whether or not it is feasible to machine in-house or to outsource to a precision engineering partner, such as Hone-All, that already has the specialist equipment, tooling and expertise required.

Performance Considerations – Selecting The Best Material For Your Application

The end-use of your part or component is also a critical concern when selecting the best material for the machining processes – both how it operates independently and as part of the wider machine or assembly. Different materials have different properties,

with varying benefits and drawbacks; for instance, brass is known for its strength and corrosion resistance while stainless steel offers superior durability and heat resistance.

Consider factors such as the strength, flexibility, weight, and thermal conductivity of the material when deciding which to use. Selecting a material that provides the properties required by your application will ensure that your final product meets customer expectations in terms of performance, quality, and compliance.

Budgeting And Cost Efficiency Considerations

Budget constraints may also play a factor in some projects; some materials are simply more expensive than others due to their rarity or difficulty in manufacturing but may still be necessary for specific projects due to their superior properties.

When specifying materials for a CNC machining project, it's important to consider both upfront machining costs and long-term performance-related costs when planning which material to use.

Upfront expenses include your material sourcing costs, in-house labour, or outsourcing costs associated with machining, installation, and assembly; meanwhile, long-term costs include maintenance and repairs over the component's expected lifespan, and potential replacement costs if needed. You should also account for delivery lead times associated with ordering some types of materials – which can fluctuate depending on market availability. If time is an issue, then it may be better to select a more commonly available substrate that can be easily sourced from local suppliers rather than opting for something more exotic or difficult to obtain.

How We Help

At Hone-All, we offer a wide range of materials for a variety of CNC machining solutions, with the tools and expertise to create high-performance, cost-effective components to meet your project brief. For a free quote or to discuss your needs, please call 01525 370666 today.