An opportunity not to be wasted

Technical article

In the quest for ever greater sustainability, manufacturing companies are looking to make savings every which way without compromising quality. Cold forming is a metal manufacturing process that not only cuts waste but improves the integrity of component parts.

Metalworking can produce a lot of waste material. For example, many metal manufacturing processes generate considerable volumes of waste metal in the form of swarf, chips and offcuts. In fact, the manufacture of many components that are cut, milled or ground from solid workpieces can result in 80% or more of the original material being converted to waste.

With environmental legislation rising high on the agenda and an increasingly discerning customer base when it comes to sustainability, manufacturing companies should consider the significant cost reductions that can be brought by cold forming, especially since they bring benefits that are not only ecological but financial.

The best way to start when cutting back on waste and inefficiency is to go for the largest targets and attacking that 80% of waste metal is a good place to start.

Modern CNC machine tools are highly sophisticated and extremely accurate but create considerable waste, regardless of the skill of the machine operator. This mountain of scrap has to be recycled, often at a cost both to the company and the environment, leading to higher part costs for the end user.

Producing parts via cold forming can provide a more cost-effective solution. Even where conventional machining remains the best solution, there are also many more opportunities to combine precision cold forming with CNC machining. This can reduce the

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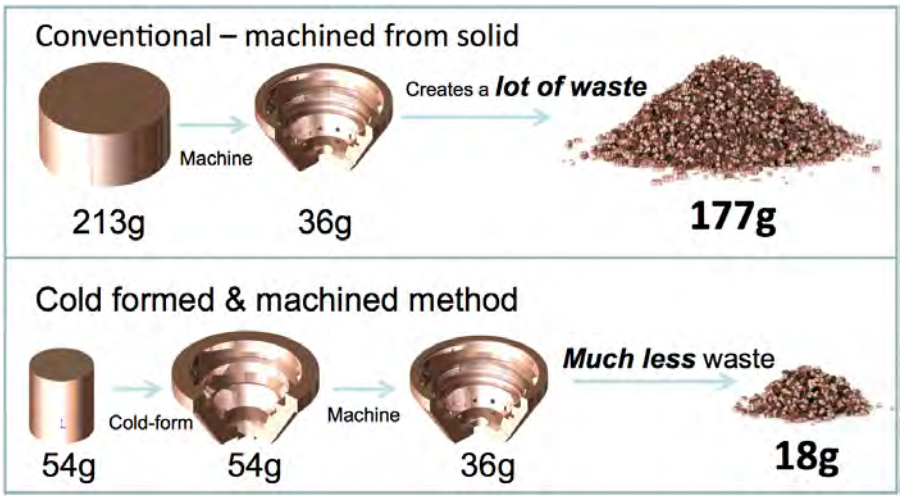
size of the initial blank of metal by 75% and scrap volumes by up to 90%.

Cold forming can now be used to shape a wide range of metals, including copper, brass, aluminium, steel and even stainless steel. In addition to the attractive cost savings that can be achieved, precision cold forming can actually enhance the material properties of the metal. In fact, cold forming using oxygen-free copper produces significantly better results than machining in many applications. This is because its superior electrical and thermal properties result in components with, for example, highly polished surface finishes. Another advantage of adopting cold forming is that parts produced using this process can be fashioned with highly complex geometries. Indeed, complex internal shapes that would be almost impossible using traditional machining can easily be produced using the cold forming process.

One indirect but nevertheless significant way in which cold forming reduces waste is that the strength of the metal itself is increased as a result of the cold forming process, resulting in tougher, longer-lasting end products. In cold forming, a simple blank, which has been sawn or cropped from a round bar or wire, is placed within a cold forming press, where die and punch tooling is used to extrude the metal under extreme pressure.

The metal is stretched beyond its yield strength but without adversely affecting its tensile strength. As a result, the strength of the part is maximised along its length, in much the same way that a sawn piece of timber is stronger along the length of the grain. Parts effectively undergo work hardening during the extrusion process, improving their machinability and durability still further. What's more, the benefits of precision cold forming described above are consistent with all types of metal, even stainless steel.



Industry at large is becoming more responsible, which means that efficient and sustainable processes are increasingly important. Cold forming delivers improved quality as well as high levels of manufacturing efficiency, proving that reviewing, evaluating and implementing advanced production processes can benefit plant performance, improve output and target sustainability.

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