

Meeting the challenge of the aerospace industry

Springs for the aerospace industry and other safety critical or precision applications bring new challenges to design and production engineers. The aerospace industry in particular has special requirements for materials, specifications, manufacturing tolerances, cleanliness and packaging. We have been manufacturing precision, high specification springs for many years and our modern manufacturing facilities and the latest state of the art spring measurement systems are ideally matched to the exacting requirements of the aerospace industry including kitting, direct line feed and protective packaging for vulnerable components.

We can offer our customers a rapid design and prototyping service in a range of materials. This service is particularly suited to the aerospace industry where small quantities are required for prototypes with the capability to move to volume production once a final design is agreed. Quality systems to ISO 9001:2000 and AS 9100 ensure consistency and accuracy of supply.



Bent Wire gets you on the move



The accelerator pedal assembly on many modern cars looks to most people like a piece of cleverly bent wire - but to us, it is a critical component with precise dimensions that has been designed to meet key safety requirements. Added to this, the component has a complex shape, needs to be strong and durable, and suitable for manufacture in large quantities at a low cost.

We at William Hughes are well used to such challenges and have many years experience in the manufacture of bent wire components. Our engineers have a wealth of knowledge and expertise, aided by the latest computer design software and CNC controlled machinery.

Using these resources, we are able to design and manufacture complex bent wire parts that meet customer's specifications for dimensional accuracy and strength. For example, a typical bent wire pedal bar may require as many as eight bends in three dimensions to achieve the required shape. Each bend has to be precisely applied to the component with consistency and accuracy.

Some manufacturers require additional individual variations, for example, a tapered boss welded to one end of the wire. To achieve this with high accuracy, we have designed a special assembly jig that provides

a foolproof method of feeding the parts into an automatic welding machine.

Variations for other two or three dimensional wire forms include twists, turns, spirals, protrusions, indentations and 'pips' that enable plastic components to be used to rigidly link assemblies together. When the components have completed their bending and forming they are finished using an e-coating (electrophoretic painting) process – an environmentally friendly process that applies a durable black coating to the component with a uniform thickness.

The William Hughes product range includes compression and tension springs, wire forms and spring wire. Stringent quality checks to ISO 9001:2000 and TS 16949, combined with the latest design, production and distribution techniques ensure continuity of supply, rapid delivery and competitive prices.

Test Point Beads Provide a Fast and Flexible Way to Insulate and Support Components on Printed Circuit Boards

William Hughes' test point beads are ideal for the design and development engineer working on prototype or small quantity printed circuit board production. The hollow beads provide a quick and flexible means to insulate and support components such as potentiometers or semi-conductors, on a printed circuit board.

Test point beads can be used to isolate resistors or the exposed legs of individual components. They can also serve as mounts for components that may need scheduled replacement, or for elevating heat-generating elements above the PCB surface.

A choice of two sizes and eight standard colours can be used to colour code components.



Bespoke solution from the expert spring makers

While most engineers think of springs as high volume commodity items, customised solutions are available from progressive spring makers sporting the required technology, expertise and willingness to adapt.

At William Hughes we are armed with process knowledge refined from over 200 years of spring production. Engineers at our high-tech Stalbridge facility liaise closely with customers to generate innovative and cost effective bespoke solutions.

Recently a major automotive plant in Germany required a rapid turnaround spring solution for seats being fitted into a new two-door model. The front seats were deemed too heavy to manoeuvre back and forth, particularly for children seated in the rear of the vehicle. With the new model already in production, the oversight demanded a speedy bespoke retrofit.

The automotive giant's tier one seat supplier approached us to design, manufacture and supply a customised spring within a four-week timeframe. Adding to the challenge, there were a number of constraints: the special spring had to be unseen, unheard and operate smoothly avoiding catch points, and we could only use the existing holes and edges available within the seat structure mechanism. Furthermore, the solution had to comply with strict health and safety regulations.



Our engineers invested a lot of time in the design office at the seat maker, where parameters such as extension force, track length, fitting space and mounting points could be assessed. Using high tensile wire less than 1mm in diameter, a special extension spring has been designed to fit with minimum effort on to the car seat structure without any modification to existing parts.

The spring features a black plastic coating to help suppress noise and pass the required BSR (buzz, squeak, rattle) test. The paint is applied at our plant in Stalbridge, where it is subject to dip-spin and oven cure.

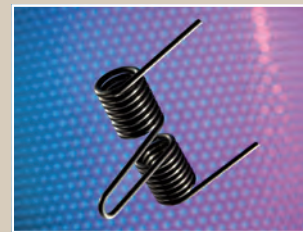


Finally the entire length of the extension spring is covered in a thin plastic sleeve, partly to act as a damping facility and partly to help prevent potential wear induced by rubbing against nearby parts.

Meanwhile, concurrent engineering ensured that the special tooling required to manufacture the prototype springs was developed in just three days. The first springs were ready for endurance testing within two weeks.

In production, a total of 1,400 bespoke springs will be required every day to meet demand from the automotive plant.

The project is a good example of what William Hughes is all about. We only make proprietary springs, we have no catalogue and we do not make for stock. We have built a reputation as a problem-solving expert that works to customer requirements.



Springs keep the tills ringing

Cash tills are in constant use in stores world-wide and checkout operators demand reliable and smooth operation. Most cash tills use a spring to perform the opening and closing of the cash drawer and one till manufacturer was experiencing problems with the closing operation, with failures occurring after 200,000 to 300,000 operations.

These failures were very inconvenient and the till manufacturer needed to find a fast and reliable solution. So the company approached us to see what could be done to modify the existing design. The aim was to improve the operation and feel of the till action, while significantly extending the operational life up to a target of 1,000,000 operations.

Our engineers proposed an improved design featuring a double torsion spring with opened up coils to reduce friction and stress. To further improve the action, all the burrs and sharp edges on the spring were removed during manufacture, and a special lubricant was lightly applied. Our design also incorporated an ancillary spring to give failsafe operation.

Prototypes were quickly produced and tested by the till manufacturer and found to exceed their demanding requirements. Bulk supplies are now in production.

Plasma Welding expertise at William Hughes



We are currently demonstrating our credentials as a leading international wire industry specialist by exploiting innovative plasma welding processes to manufacture a variety of interesting wire products destined for industries ranging from consumer electrical goods through to automotive.

Plasma welding expertise is one of many factors that give us the opportunity to stand out from our competitors. It's a process that brings better control to the arc welding process in lower current ranges, making it well suited to

small diameter, precision or miniature applications. It also offers long electrode life for high production requirements.

In basic terms, 'plasma' is a gas that is heated to an extremely high temperature and ionised so it becomes electrically conductive and inert (no impurities). The process uses this plasma to transfer an electric arc to the workpiece – in this case two ends of wire. The wire ends are melted by the intense heat of the arc and fuse together in just 2 seconds. The process is automated to obtain consistency.