



## **What Materials Can We Cut?**

Mild steel, Aluminium, Stainless steel, High-Tensile steel, and brass. (Sheet metal)

## **What Metals Can We Press?**

Mild steel, Aluminium, Stainless steel, High-Tensile steel, Copper and Brass. (Sheet metal)

## **What is Laser Cutting?**

Laser cutting is a manufacturing process which can eliminate the need for machining on many engineering jobs, enabling you to save money on manufacturing costs.

Laser cutting presents certain advantages over plasma cutting as this process is more precise and uses less energy when cutting steel and aluminium sheets. In addition, our latest laser machine is now approaching plasma machines in their ability to cut through thick materials.

The precision levels and edge quality achieved with laser cutting machines are better than traditional cutting methods, as the laser beam will not wear during the laser cutting process. Laser cutting technology also enables us to cut complex shapes without the need for tooling and at a similar or faster speed than other cutting methods.

The fact that laser cutting technology offers reduced contamination of the workpiece presents certain advantages over traditional mechanical cutting techniques.

Laser cutting also allows us to cut small diameter holes with complex detail and good edge quality in sheet, plate, or box section.

## **What is Presswork / Stamping?**

The Press or Power Press represents a specific type of machine tool, essential in the performance of industrial manufacturing processes. Presses deliver energy through a force that acts over a distance or stroke.

The Press or Power Press accommodates both single operation and progression tooling and delivers energy through a force that acts over a distance or stroke. The method and nature by which a press machine will deliver its energy will vary, dependent on its type and tonnage.

At Qutec, we can offer press capacity ranging from 20T through to 500T with bed sizes ranging up to 1m x 1.5m. In turn, a number of our presses are able to feed up to 600mm wide coil on progression.

Press machines are the primary machine used in metal forming, extrusion and sheet metal fabrication. Hydraulic and mechanical presses can be employed across metal sheet, coils, strips or blanks, producing metal pressings or drawn and formed metal components.

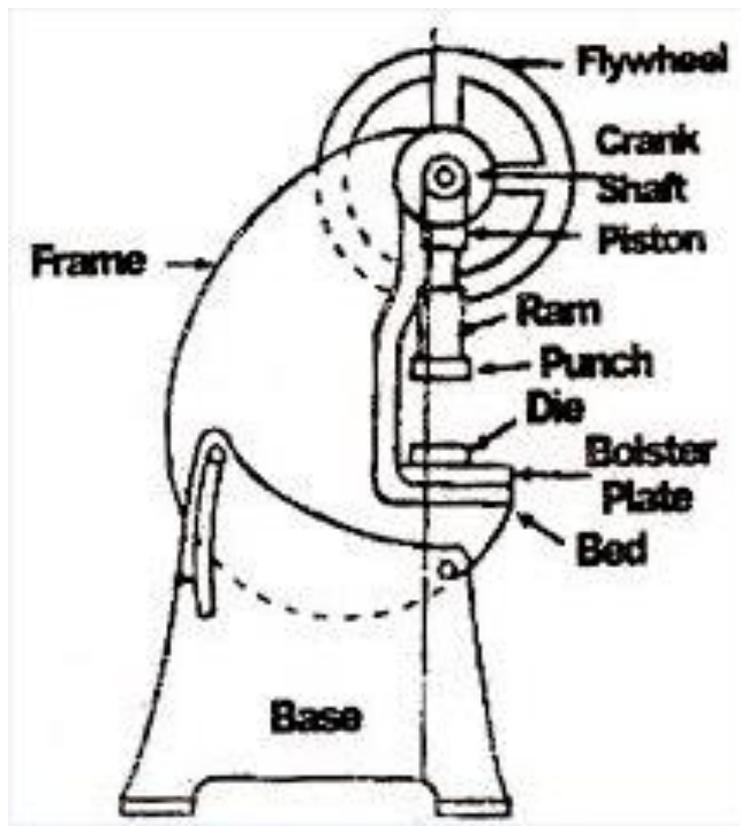
## **Metal punching services - a machine breakdown**

A Punch Press is a computer programmable power press which can be programmed to punch and form shapes from sheet metal materials. In lighter gauge materials the use of a punch press can result in a cheaper alternative of product manufacturing when compared to "hard tooling" for standard power presses or laser profiling.

**Stamping** (also known as **pressing**) is the process of placing flat sheet metal in either blank or coil form into a stamping press where a tool and die surface forms the metal into a net shape. Stamping includes a variety of sheet-metal forming manufacturing processes, such as punching using a machine press or stamping press, blanking, embossing, bending, flanging, and coining. This could be a single stage operation where every stroke of the press produces the desired form on the sheet metal part, or could occur through a series of stages. The process is usually carried out on sheet metal, but can also be used on other materials, such as polystyrene.

Press machine tools vary in size and in the amount of force they can output. The energy from a press is often used to do work requiring a tremendous amount of force. The method and nature by which a press machine will deliver its energy will vary, dependent on its type.

A Punch Press is used to form holes, whilst a Screw Press is also known as a Fly Press. A Stamping Press is a machine press used to shape or cut metal by deforming it with a die. It generally consists of a press frame, a bolster plate, and a ram. Capping Presses form caps from rolls of aluminium foil at up to 660 per minute.



- |                   |                       |
|-------------------|-----------------------|
| Hydraulic Presses | Mechanical Presses    |
| Crank Presses     | Knuckle Joint Presses |
| Eccentric Presses | Rack And Pinion Press |
| Screw Presses     | Turret Presses        |

### **Why use Laser manufacturing process over Presswork?**

Laser cutting can be used for producing flat blanks of almost any shape and its versatility lends itself to applications in a wide variety of industries from model making to shipbuilding but one of its most important features is its ability to produce blanks without the need for hard tooling. This not only vastly reduces the cost of producing prototypes but also greatly reduces the time required. It also enables modifications to be made quickly and easily. The time and cost savings to press workers is enormous. Blanks, or modifications, can be produced in a matter of hours whereas in the past it may have taken weeks.

## What material thickness can be cut Laser cut?

We have recently invested in an Amada FO11 3015 4.0KW Laser, allowing us to cut up to 20mm mild steel at a much faster pace. Capabilities below;

<u>MODEL</u>	<u>FO11 3015 4kW</u>
<u>Laser Power</u>	<u>4000W</u>
<u>Laser Source</u>	<u>CO2</u>
<u>Series</u>	<u>i-C</u>
<u>Max. Axis Speed (simultaneous)</u>	<u>114m/min</u>
<u>Working Range (X x Y x Z)</u>	<u>3070 x 1550 x 200 mm</u>
<u>Max. Sheet Weight (kg)</u>	<u>950</u>
<u>Max. Machine Weight (kg)</u>	<u>9500</u>
<u>Max. Material Thickness:</u>	
<u>- Mild Steel (mm)</u>	<u>20</u>
<u>- Stainless Steel (mm)</u>	<u>15</u>
<u>- Aluminium (mm)</u>	<u>10</u>

## How big can we make one piece of sheet metal work?

3m x 1.5m as a singular part without joining (welding, riveting, gluing, assembling).

## What is Press Brake bending or forming?

A press brake, also known as a brake press, is a machine tool for bending sheet and plate material, most commonly sheet metal. It forms predetermined bends by clamping the workpiece between a matching punch and die.

Bending process; typically, two C-frames form the sides of the press brake, connected to a table at the bottom and on a moveable beam at the top. The bottom tool is mounted on the table with the top tool mounted on the upper beam.

The brake consists of a flat surface onto which the material is placed, and a clamping bar which will come down and hold the material firmly during the bend. This clamping action may be manual, automatic or operated using a foot pedal. The front, gate-like, plate of the machine is hinged and may be lifted, forcing the material extended over a straight edge to bend to follow the plate.

The bends can be to any angle up to a practical limit of about 120 degrees, somewhat more in the case of a bar folder. If the area to be bent is narrow enough, a sharper bend (e.g., for a hem) can be made by inserting the bend under the clamping bar and lowering it.

A good example of the type of work a Press brake can do is the back plate of a computer case or fireplace. Other examples include brackets, frame pieces and enclosures just to name a few. Some press brakes have CNC controls and can form parts with accuracy to a fraction of a millimetre. Bending forces can range up to 3,000 tons.

## What material thickness can be put on a Brake Press?

0.2mm to 12mm is the range of thickness but tonnage restricts the length of form the thicker the material.

## What is CE Marking EN 1090–1:2009 + A1:2011 Welding Accreditation and what does this mean?

From 1st July 2014 all fabricated structural steelwork must meet the harmonised European standard BS EN 1090 and carry the CE mark. QuTec Pershore LTD has maintained its investment in both personnel and quality control systems to ensure that it achieves certification, which is determined by an independent assessment. The accreditation also ensures that QuTec Pershore LTD continues to maintain its membership of the British Standards Institute (BSI).

In 2013 the new Construction Products Regulations were released, making CE marking mandatory and requiring fabricators to demonstrate that their internal training, qualifications and quality control procedures met the necessary standards.

### LEGISLATION

BS EN 1090-2 requires that for any project, the required quality of fabrication or Execution Class must be specified. This determines the level of quality required within the fabrication process, according to the type of building, height, area and purpose.

Class	System Level	Type of Work Undertaken
EXC1	Elementary Quality System	Farm Buildings
EXC2	Standard Quality System	Buildings
EXC3	Comprehensive Quality System	Bridges, Stadia
EXC4	Comprehensive Quality System	Special Structures

Every construction must be classified under one of the four levels where Execution Class 2 (EXC2) will be appropriate for the majority of buildings constructed in the UK. If the Execution Class is not specified on a project then EXC2 shall apply.

### ACCREDITATION

QuTec Pershore LTD has been accredited to EXC2, which has a more arduous approvals standard but allows it to fabricate the vast majority of steel structures. The certification provides evidence of a suitable Factory Production Control (FPC), which ensures traceability of every component from source through the fabrication process and to final delivery to site.

The BSI has made CE Marking compliance a condition of membership and therefore selecting a BSI Member, such as QuTec Pershore LTD, will ensure compliance with the regulations. The client, main contractor or insurer would not need to carry out due diligence of the steelwork contractor in this case since it has already been undertaken by the BSI as part of their membership audit.

## What is CO2 Welding?

CO2 welding is a variation on MIG welding where the shielding gas that is usually argon or another inert gas is replaced for carbon dioxide. This is usually used as carbon dioxide is not only cheaper but it is more readily available.

## What is TIG Welding?

TIG stands for Tungsten Inert Gas welding which is an arc welding process that uses a non-consumable tungsten electrode to produce the weld. The weld area is protected from atmospheric contamination by an inert shielding gas (argon or helium), and a filler metal is normally used, though some welds, known as autogenous welds, do not require it.

## What is MIG Welding?

MIG stands for Metal Inert Gas welding which is a welding process in which an electric arc forms between a consumable wire electrode and the workpiece metal, which heats the workpiece, causing them to melt, and join. Along with the wire electrode, a shielding gas feeds through the welding gun, which shields the process from contaminants in the air.

## **What is resistance Spot Welding?**

Resistance Welding is a thermo-electric process where heat is generated at the interface of the parts to be joined by passing an electrical current through them for a precisely controlled time and under a controlled pressure (also called force). The name "resistance" spot welding derives from the fact that the resistance of the workpieces and electrodes are used in combination or contrast to generate the heat at their interface.

Key advantages of the resistance welding process include:

- Very short process time
- No consumables, such as brazing materials, solder, or welding rods
- Operator safety because of low voltage
- Clean and environmentally friendly
- A reliable electro-mechanical joint is formed

Resistance spot welding is a fairly simple heat generation process: the passage of current through a resistance generates heat. In addition to the bulk resistances, the contact resistances also play a major role. The contact resistances are influenced by the surface condition (surface roughness, cleanliness, oxidation, and plating's).

The materials that can be welded by this process include low alloy and mild steel, stainless steel, Aluminium and light-alloys, nickel and its alloys, galvanized sheets, brass and copper

## **What is Shot Blasting?**

Shot blasting is a method used to clean, strengthen (peen) or polish metal. Shot blasting is used in almost every industry that uses metal, including aerospace, automotive, construction, foundry, shipbuilding, rail, and many others.

### **Wheel blasting**

Wheel blasting directly converts electric motor energy into kinetic abrasive energy by rotating a turbine wheel. The capacity of each wheel goes from approximately 60 kg per minute up to 1200kg/min. With these large amounts of accelerated abrasive, wheel blast machines are used where big parts or large areas of parts have to be derusted, descaled, deburred, or cleaned in some form.