

winward engineering Ltd.



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VAT No. 747853978
Registered in England. 3735372



Art Metalware
Manufacturers
Association
AMMA



INTRODUCTION

Established in 1944 Winward Engineering Ltd is a 3rd generation family run company.

In striving to provide high standards of Quality Management.
Winward Engineering Ltd are proud to say that ISO 9001:2008 registration has been held by the company since 1998.

Whether you are looking for a one off prototype, or a large batch run, and capable of working with metals of all sizes, Winward Engineering Ltd guarantee you the service you require.
Where you can expect a total solution to your metal work needs as dictated by yourself.

Services Provided include:-

- Stainless Steel Metal Spinning
- Steel Metal Spinning
- Metal Spinning
- Metal Pressing
- Laser Cutting, CNC High definition Plasma Cutting
- Fabrication of Standard and Non Standard metals

Sectors Serviced include:-

- Aerospace
- Automotive
- Architectural
- Food Processors
- Scientific
- Electronic as well as many others

In House Capabilities include:-

- Hand Metal Spinning
- Hydraulic Metal Spinning
- CNC Metal Spinning
- CNC Plasma Cutting
- Laser Cutting
- Welding / Braising / Soldering
- Metal Pressing
- Circle Cutting
- Blanking
- Shearing
- Cropping
- Tube Bending
- Guillotine Work
- Metal Polishing / Satin finishing.
- Tool Turning
- Brass / Clear Lacquering
- Powder Coating
- Degreasing
- Assembly

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METAL SPINNING

With over 70 years of experience in spinning and combined with our **ISO 9001:2008** certification Winward Engineering Ltd can ensure quality and traceability of its products. Winward Engineering are capable of spinning all types of metals from mild steel / aluminium to specialist metals such as titanium, zirconium and inconel to name but a few.



As a company Winward Engineering Ltd have serviced a large variety of industry sectors some of which are included previously, undertake small and large batch runs and are able to spin a large range of sizes up to 2.25m diameters.

Winward Engineering Ltd operate a range of spinning methods which include hand spinning, hydraulic spinning, **shear forming** and **flow forming**. Winward Engineering Ltd's wide range of existing tooling enables in many cases to keep tooling costs to a minimum.

Should your specific component require new

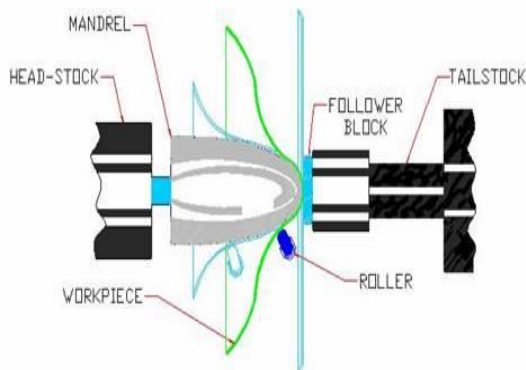
tooling Winward Engineering Ltd can produce this for you, thereby giving you the best value.

Winward Engineering Ltd regularly produce batch component runs for all sectors of industry in particular the Aerospace and Automotive, where components need to be proved out before going into full production.



The mechanical working of the metal during the spinning process refines and strengthens its grain structure, as well as eliminating hidden and surface discontinuities to improve metal integrity. The process is particularly adaptable to concentric circular shapes and segments and can present

considerable savings in materials and machining when compared to cast or forged parts. Spinning also makes it possible to produce components with thinner wall thicknesses directly, without machining them down to size.



Simple tooling requirements, involving primarily a contoured spinning mandrel, reduce lead times and keep tooling costs relatively low, particularly for prototype and limited production quantities.

Winward Engineering Ltd will work with you to optimise your design for the metal spinning process.

Should you have any questions during your design phase, we would welcome your **CONTACT** as this is the best time to consider Winward Engineering Ltd. as your spinning source to enable us to communicate our unique capabilities and how they can be brought to bear upon your new design.

We specialise in small quantities and prototyping...

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Design Considerations for Metal Spinning

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For general information purposes we will cover a few basics here:

Shape

Metal Spinning is limited to concentric or round shapes. Whenever possible, design parts that increase in diameter as the depth increases. Radii can be no smaller than 2X material thickness. Whenever possible design the diameter greater than or equal to 2X the overall depth of the part. (A hemisphere would be an excellent example of a part that has a diameter twice the depth) While it is possible to exceed this ratio, in some cases significantly, this will create the most cost effective parts.

A wide variety of steps and or radii can be produced. Steps or strengthening ribs can be designed into parts. This often allows thinner, and more cost effective, material to be used while maintaining part strength and functional requirements.

Reverse angles (where the diameter decreases with the depth to the open end)

can cause difficulties and will certainly add substantial costs in both tooling and processing times. The reverse angle prohibits the part from being stripped from the mandrel.

Diameter and Material Considerations

Winward Engineering Ltd. can produce parts up to 96" (8ft) in diameter and .375" in thickness. Since we operate powerful CNC controlled and hydraulically actuated lathes we can produce parts from Stainless Steel, Red Metals, and some Aerospace alloys that work harden very rapidly.

Winward Engineering Ltd. can also produce parts in Carbon Steel, Coated Steel, and Aluminium. Since the metal spinning process works the material more than some processes we suggest that most powder coating, painting and plating be performed after spinning. It is possible to spin galvanized and galv-annealed materials without significant thinning or flaking of the coating.

Piercing Holes and Slots

In many cases parts need to have holes, slots, or indentations so that other parts can be joined to them with fasteners. **Winward Engineering Ltd.** operate CNC controlled turret presses which can produce numerous holes, hole sizes, and precise patterns in a single operation. This is a very efficient and cost effective method. We also operate punch presses, beading and trimming machines, and brake presses that enable us to punch holes, and bead or brake flanges after spinning the part to its final dimensions.



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Tooling

Tooling for Metal Spinning is inexpensive compared to stamping and hydro-forming dies. Typically the savings are 75% - 90%. Winward Engineering Ltd. produces all tooling in-house out of wood, tool steel, or composites. We often use old tooling and re-form it to enable cost savings for our customers.



Tolerances

Metal Spinning is not a close tolerance process when compared with CNC machining and forming processes. However, with the advent of CNC controls we are able to produce closer tolerances than have ever been possible with manual Metal Spinning equipment. On our CNC lathes we can hold tolerances of less than .030 on most dimensions. Additionally, it is possible to hold much tighter tolerances on some dimensions, depending on material type, thickness, and part geometry.



CNC Advantage

CNC metal spinning technology has additional benefits:-

- It vastly increases production rates
- It provides consistency from first part to last
- It improves finishes

Industries served

Our expertise lies in metal spinning, with this we have also been involved in products for the following industries:

AEROSPACE	FUEL TANKS
AGRICULTURE	FUNNELS
ARCHITECTURAL	FURNISHING, TABLE TOPS AND BASES
BREWING	HEATING
CLOCK CASES AND BEZELS	HOLLOWWARE
COOKING UTENSILS, SHOP FITTING	HOPPERS
SILENCERS	MARINE BUOYS
TANK ENDS	NON STOCK TUBES
VENTILATION	PIPE REDUCERS
VENTURIS, VESSELS, DISHED ENDS	VACUUM CLEANERS, WHEEL TRIMS



METAL PRESSING and FABRICATION

Double Action Presswork

Our production presses range from **30 to 200 tonnes** capacity. We have deep drawing presses which produce cylindrical or any shape of drawn pressing at speed. We also have Rhodes presses and many other different makes of large mechanical and hydraulic pressing machinery enabling us to produce a large range of different types of metal pressings. We offer the capabilities of taking on tools of sizes up to 1 metre by 1.5 metres

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Hydraulic Presswork - up to 200 tonnes

All components are made specifically to customer requests. Incorporating a diverse range of components, for a variety of industries, which include the automotive, electronics and engineering markets. Working to tight delivery requirements, we ensure high quality components are delivered on time.

Our customer base includes well established blue chip companies, whose products are sold worldwide. We can provide a variety of components to a single source or just one component. Whether you require two or two million, we have the flexibility to satisfy your request.



Single Action Presswork

Winward Engineering Ltd's policy is to manufacture pressings utilising the most automated method possible, thus helping our customers retain their competitive edge. There is always a need for single operation presses, whether for finishing operations, or where component design or volumes dictate that manufacture by automated means is not feasible. To that end we also have a range of single operation presses ranging from **50 to 200Tonnes** available to supplement our range.



- Hand Presswork
- A Variety of Specialist Presses

Roll Feed Presswork/Progression/Progressive Presswork

The extensively equipped roll feed department utilises electronically controlled pneumatic/mechanical feed systems.

Our range of blanking, follow on and progression lines are capable of processing coil up to and including 4mm gauge or 200mm width.

Load monitoring equipment is utilised on our presses and tooling to safeguard tooling and detect any potential quality problems

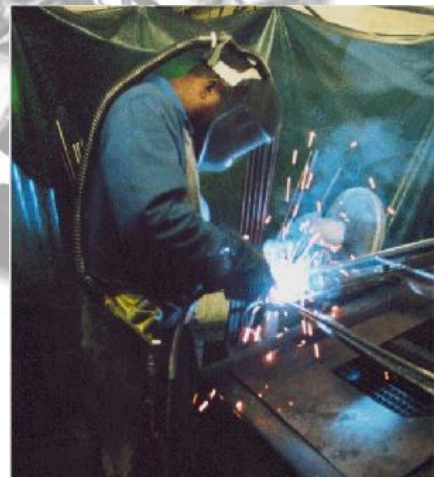
FABRICATION

Winward Engineering Ltd. undertake many forms of fabrication including **MIG welding, TIG welding sheet forming, piercing, plunging, tapping, folding, brazing and cutting** on a daily basis.

With over 60 years of skills and knowledge we can offer this service to you at your disposal.

OTHER CAPABILITIES

We are able to undertake circle cutting up to 3M (9'), blanking, shearing, cropping, tube bending and guillotine work.



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We stock a comprehensive range of tools which with our other facilities enables us to produce prototype and experimental work to customers own requirements.

We can machine finish many different spinnings to tight tolerances both in large and small quantities.

Electrophoretic lacquering

Below we show here the 2 stage quality stations.

Bezels shown here are for gauges and instruments after our pre-stage wash on the 1st way travel to our oven for pre-dry.

After treatment, coating and final inspection the products then return to our warehouse for bagging and despatch. On this fully automatic track we can produce up to 7000 components per working shift.



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PLASMA CUTTING

Winward Engineering Ltd. Is able to offer a comprehensive Plasma & Laser cutting service, depending upon the required process or part, that will enable your designs to be realised. Plasma cutting is suitable for a variety of materials in particular mild steels and stainless steels producing an excellent edge finish.

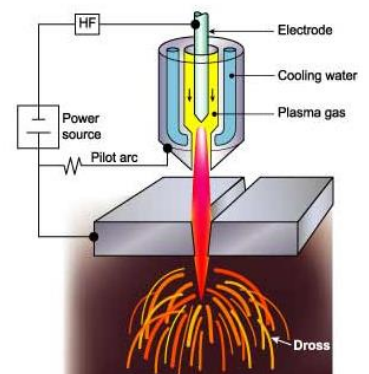
CNC **plasma cutting** is a process of cutting 2D shapes from sheet metal using a high temperature, high velocity stream of ionized gas. The plasma stream is generated by directing the flow of an inert gas through an orifice where an electric arc ionizes the gas. The material is thereby heated to a molten condition and the high velocity gas stream blows the material away. This can cut 1" mild steel, or anything ranging up to 2". However we cut it, we get squarer edges, and cleaner, consistent parts.

The RUR profile cutting machine is designed specifically for our **high production** demand. The machine frame is constructed from a mild steel fabricated design, ultrasonically stress relieved and manufactured to highly accurate tolerances. The machine is driven through twin side rack and pinion drives by servo motors and planetary gearboxes which are **digitally synchronised**. The rail system is manufactured using precision ground bar mounted on box section which is fitted on to thick walled fabricated track stands.



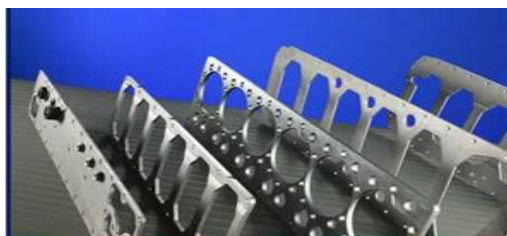
CNC plasma cutting offers lower costs since no custom tooling is needed and is especially cost effective for thick metal sheets. CNC plasma cutting can usually cut thicker sheets than laser. The process is generally used to cut **2D shapes** not requiring high precision or fine detail.

CNC Plasma Cutting Process



Design considerations

- Edges can be rough, especially for thicker material and more so with aluminium than steel.
- The cut edge will have an oxide layer
- The angle of the edge can deviate from 90 degrees typically by 10 to 20 deg.
- Edges may have pits at some points along the edge (with depth typically up to material thickness).
- Some warping can occur on intricate parts.
- As in blanking and piercing, considerable economies can be obtained by nesting parts, and Cutting along common lines. In addition, secondary de-burring operations can be reduced or eliminated.



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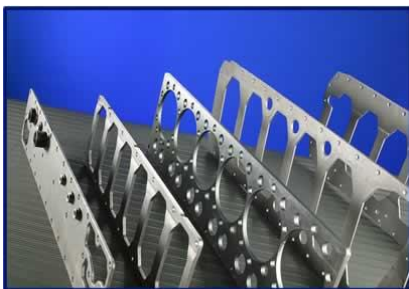
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LASER CUTTING

Winward Engineering Ltd. are able to offer a comprehensive laser cutting service that will enable your designs to be realised.

Winward Engineering Ltd. can cut a large variety of metals including stainless steel, mild steel, titanium and many other precious and non-precious metals. We are also able to cut a variety of different types of materials such as wood, some acrylics and even glass components.

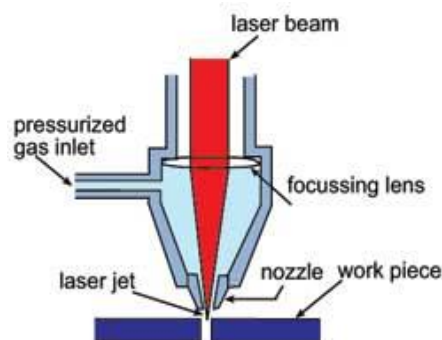
Our in house design capabilities mean that we can produce the CAD drawings that your designs and components may require. Alternatively you may prefer to supply us with your own drawing files, which we can then transfer to the laser cutter.



Winward Engineering Ltd. can service both small and large batch cutting at very competitive prices.

Winward Engineering Ltd. excel in producing finished components from start to finish, this is achievable because of the wide variety of services provided and cater for. Therefore whether you require only laser cutting or a complete finished component then Winward Engineering Ltd. is part of your solution to meeting all of your requirements.

Laser Cutting Process



During the laser cutting process, a beam of high-density light energy is focused through a tiny hole of the nozzle. When this **beam** strikes the surface of the work piece, the **material** of the work piece is cut immediately.

Lasers work **best** on materials such as carbon steel or stainless steels.

Metals such as **aluminium and copper** alloys are more difficult to cut by laser due to their ability to reflect the laser light as well as absorb and conduct heat. These **materials** require more powerful lasers.

Some of the materials that can be cut by the laser cutting **process** are mentioned below.

Stainless steel	Gold	Hastelloy	Delrin	Laminates
Carbon steel	Silver	Zirconium	Nylon	Glass
Titanium	Aluminium	Ceramic	Wood	Rubber
Inconel 625	Cobalt	Polyethylene	Plywood	Leather
Nickel	Galvanized steel	Acrylic	Fibreglass	Paper

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FINISHING ETC..

Powder Coating.

Powder coating is an on site service offered by Winward Engineering Ltd and serves a variety of industry sectors. We undertake both large and small batch runs and can powder coat a variety of sizes up to 2.25m in diameter.

Epoxy polyester powder coating is ideal for general indoor use and other applications where high UV stability is not required. Zinc rich epoxy coatings are also available as primer coats on phosphated or blast-cleaned steel objects and structures and when combined with a polyester top coat offers enhanced resistance to weathering and corrosion.



Low cure coatings are also available which require lower oven temperatures and as such offer a cost saving, more useful on longer production runs.

Winward Engineering Ltd boast the only fully automatic powder coating /lacquering track in the UK.

Why powder coating?

Over the past decade powder coating has been increasingly accepted as the preferred finishing process for the future. The reasons for this conversion from wet to dry can be attributed to three major forces: economy the high cost of energy and materials require a more cost effective and less wasteful process; excellence for consumers, and other end users, are demanding higher quality and more durable finishes; and ecology progressively more stringent regulations are being aggressively enforced in an effort to control air pollution and hazardous waste disposal.



Which in turn goes back to economy. The cost of complying with the Regulations and the disposal of toxic and flammable waste are constantly rising.

All components are individually checked, cleaned and inspected prior to final packaging. Any further processes are then carried out. i.e. labeling, corner protecting, taping, fittings of other relative parts.

All coating are available in a range of gloss levels:-

Full Gloss 90%
Semi Gloss 60%
Satin 30%
Matt 15%



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Lacquering, Polishing and Anodising.



From the raw material we can spin, press, shear, polish, sateen, laser cut parts then either antique, verdi gris or ***powder coat*** them as shown.

For raw metals, the process begins with a 4-Stage Spray Phosphate Power Wash complete with a De-Ionized water final rinse. The complete system is Statistically Process Controlled (SPC) for Chemical Concentration, Total Dissolved Solids, Solution Temperature and pH balance.

We undertake Fabrication on a daily basis in many different forms. We supply many different sectors of industry with both completed parts and also carry out specific operations to components.

Above is one of the in-line baking ovens for the coating line. Parts are hung on metal hooks to pass through the degreasing and powder coating lines. This is to ensure the electrostatic particles adhere to the desired surface and produce an even finish as required.



Complete beds, headboards and parts are manufactured to our customer's own designs from repetition to one off bespoke items.

We use either RAL or PANTONE references for the desired powder coated colour match.

ALL IN HOUSE>>>>>...

Parts and componentry in various metals are also available.

Featured are a few examples of bed knobs that are supplied to various manufacturies.



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Welding Services

Winward Engineering performs a number of welding processes. These being, MIG, TIG, Spot, Soldering and Brazing. The two most common welding processes we use include TIG, an acronym for Tungsten Inert Gas welding and MIG, an acronym for Metal Inert Gas welding. TIG is also referred to as GTAW (Gas Tungsten Arc Welding) and Heliarc.

MIG also is referred to as GMAW (Gas Metal Arc Welding). We also provide spot welding.

Soldering and brazing is also undertaken here in house at Winward.

Soldering is a process in which two or more metal items are joined together by melting and flowing a filler metal (solder) into the joint, the filler metal having a lower melting point than the workpiece. Soldering differs from welding in that soldering does not involve melting the work pieces. In brazing, the filler metal melts at a higher temperature, but the work piece metal does not melt.

Formerly nearly all solders contained lead, but environmental concerns have increasingly dictated use of lead-free alloys.

We currently solder a variety of things for our stock range of bezels for clocks, gauges and the like. This can be seen here in the photo. After we have either soldered or brazed the two metals the complete component is polished or painted in house.

Bubble Caps

We manufacture bubble caps, risers and most fittings etc. for the petroleum industry in-house.

We use most metals to reproduce to drawing or sample received. We have been supplying the petroleum industry for over 35 years now and understand the criteria, standard and quality required.

A bubble cap tray has a riser or chimney fitted over each hole, and a cap that covers the riser. The cap is mounted so that there is a space between riser and cap to allow the passage of vapour. Vapour rises through the chimney and is directed downward by the cap, finally discharging through slots in the cap, and finally bubbling through the liquid on the tray.

Material Available: Stainless steel, Mild Steel, Brass, Copper.

Opening Times

Works		Office	
Monday	7.30am – 4pm	Monday	8.30am – 4pm
Tuesday	7.30am – 4pm	Tuesday	8.30am – 4pm
Wednesday	7.30am – 4pm	Wednesday	8.30am – 4pm
Thursday	7.30am – 4pm	Thursday	8.30am – 4pm
Friday	7.30am – 1pm	Friday	8.30am – 1pm

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Contact Information

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