

winwardengineering Ltd.

Metal Spinning, Metal Pressing, Laser Cutting, Fabrication.

INTRODUCTION

EST: 1944

Stainless Steel Metal Spinning, Steel Metal Spinning, Metal Spinning, Metal Pressing, Laser Cutting and Fabrication of standard and non standard metals from **winward engineering Ltd.** We boast that we hold an **ISO 9001:2008 certification for metal spinning.**

Capable of working with metals of all sizes, winward serve a variety of sectors including the Aerospace, Automotive, Food Processors, Scientific and Electronics sectors as well as many others.

Winward offer the service you require whether it is a one off prototype or a large batch run. Winward offer a total solution dictated by you.

Our In-House Capabilities:

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



METAL SPINNING

Winward Engineering has over 65 years experience in spinning and our **ISO 9001:2008** certification ensures quality and traceability. We spin all types of metals from mild steel, aluminium to specialist metals such as titanium, zirconium and inconel to name a few.



Winward service a large variety of industry sectors such as *Aerospace, Automotive, Food Processing* and *Scientific*. We undertake both large batch and small batch runs and are able spin a large variety of sizes up to 2.25m diameters.

WE operate a range of spinning methods including hand spinning, hydraulic spinning, **shear forming** and **flow forming**. Our wide range of existing tooling enables us in many cases to keep tooling costs to a minimum.

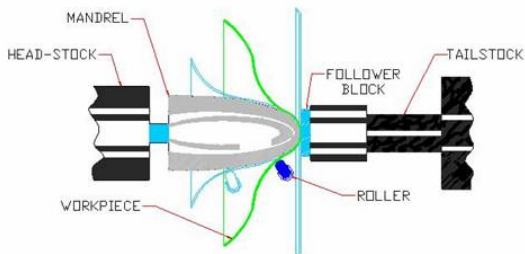
Should your specific component require new tooling Winward could

produce this for you, giving you the best value.

We regularly produce small batch component runs for all sectors of industry especially the Aerospace and Automotive, where components need to be proved out (FAIR) 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. Feel free to CONTACT our staff if you have questions during your design phase. This is the best time to consider **winward engineering ltd.** as your spinning source as we can communicate our unique capabilities and how they can be brought to bear upon your new design.

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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. We also produce parts in Carbon Steel, Coated Steel, and Aluminum. 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 galvanized materials without significant thinning or flaking of the coating.



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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.** operates CNC controlled turret presses which can produce numerous holes, hole sizes, and in 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.



Tooling:

Tooling for Metal Spinning is inexpensive compared to stamping and hydroforming 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 for our customers saving.

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:

- Vastly increases production rates
- Provides consistency from first part to last
- Improves finish

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

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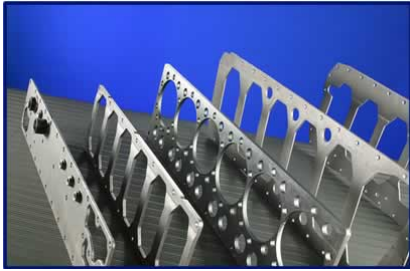


LASER CUTTING

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

We 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 and 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.



At Winward we service both small and large batch laser cutting at very competitive prices.

Winward excel in producing finished components from start to finish, we can do this because of the wide variety of services

we provide and cater for. Therefore whether you require only laser cutting or a complete finished component then Winward are part of your solution to meet all of your requirements.

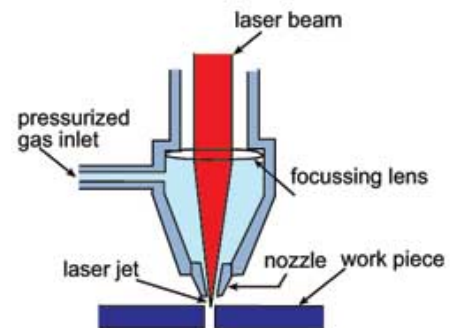
Laser Cutting Process



During 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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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

Hydraulic Presswork - up to 200 tonnes

All components are made specifically to customer requests. Incorporating a diverse range of components for various industries including 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 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 undertake many forms of fabrication including **MIG welding, TIG welding sheet forming, piercing, plunging, tapping, folding, brasing and cutting** on a daily basis. With over 60 years of skills and knowledge we can offer this to you at your disposal



OTHER CAPABILITIES

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

On the left we show here one of the 2 stage quality stations. Bezels shown here 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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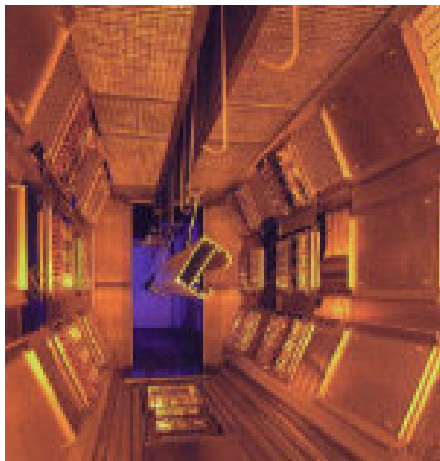
FINISHING ETC..

Powder Coating.

We are able to undertake specialist powder coating on our own premises.

With **experienced staff** and state of the art equipment we currently powder coat a wide range of components with individual variety of coatings. Amongst others, below are listed finishes we also provide.

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

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knobs that are supplied to various manufacturies



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The 3rd generation family company that cares...

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