



Datum

Engineering & Manufacturing Excellence

www.datumalloys.com



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About Datum

Datum Alloys specialise in the supply, handling, cutting, and machining of thin metal sheet and foil to tight tolerances. Our bespoke coil to part laser and precision CNC milling machines produce laser cut and milled parts to order. From design to part, prototypes to production, we produce the highest quality, precision cut metal parts to your specifications.



Industry Leaders: Datum has a proven track record with rigorously tested products and services, industry-leading delivery times and optimal results.

Global Operations: With locations in the UK, USA, and Singapore we can service our customers and maintain strong relationships wherever they are in the world.

Precision: Our thickness controls and tolerances lead the industry. We are the only company to guarantee a 2% thickness tolerance on our advanced stainless-steel foils. We only supply the best performing materials and provide products with the highest degree of precision.

Efficiency: We offer the fastest delivery times in the industry and regularly ship on the same day. All orders are shipped within 48 hours, and this is a metric we continue to invest in and improve on.

Guaranteed Performance: All Datum products are rigorously tested before coming to market, and this test data is available. Our suppliers are controlled by our strict purchasing specifications and audits. We test all incoming material and outgoing products to ensure they meet our standards, and we guarantee performance for our customers. We are ISO 9001:2015 certified.

Stainless Steel Supplies

Datum stock 301 & 304 Stainless-steel in a range of precision foils and sheets from 0.02mm to 0.50mm thick. As part of our stainless-steel supplies, we offer a wide variety of sizes and gauges supplied on the coil or in sheet form, all of which are oil, grease, and scratch free. With our specialised handling and cutting machinery, we can cut from coil, stack, and ship sheets in the dimensions you require.



Working closely with metal foundries we have developed our own precision grade stainless steels to meet exacting specifications and dimensional accuracy. One of our specialist stainless steels has had its mechanical properties managed in such a way that it enables it to perform better than standard stainless steel when put under high tension.

All Datum stainless steel has a homogenous grain structure and low internal stress which means it remains flat allowing you to cut and machine to tight dimensional tolerances.

304 stainless-steel (Datum PhD) Hard rolled stainless

0.02mm to 0.50mm thick

301 stainless-steel (Datum Tension Fine Grain) Extra hard stainless

0.05mm to 0.2mm thick

BENEFITS OF DATUM STAINLESS STEEL

Datum Alloys stock high quality stainless steel used by manufacturers for formed, punched and laser cut parts. With its unique grain structure and machining properties it has become the industries preferred metal for PCB stencil manufacturers and photo etch companies when high performance, reliable material is required.

SPEED OF MACHINING

Due to the precision grade quality, Datum stainless steel can be machined quickly enhancing productivity and decreasing time in the production or prototyping process.

RELIABILITY

Datum PhD and Datum Tension/Fine Grain is manufactured under controlled conditions to specific standards making it predictable in performance and reliability.

MACHINABILITY

High quality stainless steel is one the most versatile alloys available. Easy to form, Datum PhD and Datum Tension/Fine Grain stainless is used for machining, laser cutting, stamping and roll forming allowing intricate designs to become a reality.

ACCURANCY

Due to stainless steel's machinability, tight tolerances can be achieved for precision accuracy. Our micro tooling helps make devices such as implantable pacemakers and defibrillators smaller and less invasive.

LIGHTWEIGHT

Datum's stainless high strength-to-weight properties allow reduced thickness compared to conventional stainless grades resulting in a lightweight product.

DURABILITY

Our stainless steel will maintain high strength and stability under extreme temperature changes without scaling.

COST EFFECTIVE

Datum stainless' long-term durability increases product lifecycle reducing replacement costs.

CORROSION RESISTANCE

Datum stainless has a high corrosion resistance making it suitable for a variety of rigorous environments.

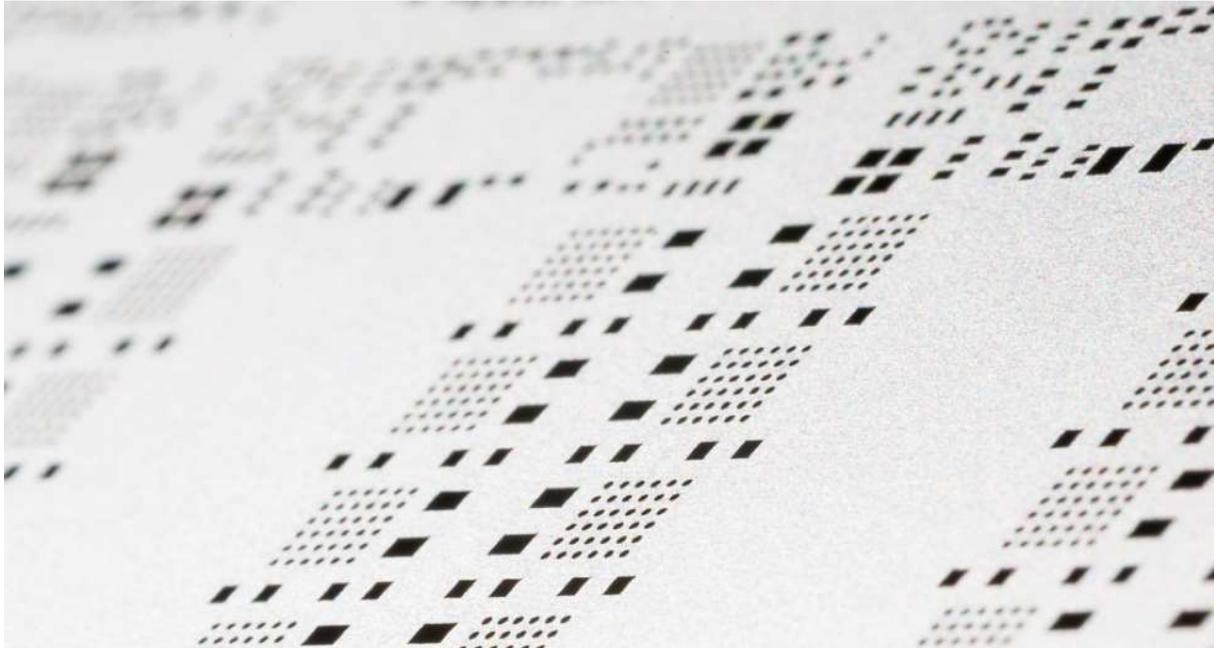
Get in touch with the Datum team for your stainless-steel supply. With offices in the UK, US and Singapore Datum are well positioned to supply steel throughout Europe and the rest of the world. We offer the fastest delivery times in the industry and regularly ship on the same day.



SMT Stainless Steel Stencil Foils

SMT stencil foils perform the critical task of depositing solder paste, adhesive or flux onto the PCB. The material that the foil is made from influences its dimensional accuracy, solder paste release properties and useful life.

Our innovative approach to ever-changing technologies keeps us and our customers at the forefront of what's possible.



PhD – 304 Stainless

- Market leading material for over a decade
- Proprietary rolling and heat treating relieves internal stresses, resulting in less deformation during laser cutting and stencil printing
- 2% thickness tolerance controls area ratio and volume variations during print process
- Excellent for general SMT with area ratios >0.66

Tension FG – 301 Stainless

- All foil materials are available pre-mounted to our frames or as sheets cut to standard and custom sizes. We can also ship stencil foils with pre-milled pockets or cavities, ready for laser cutting.

SMT Pre-Meshed Stencil Frames

Datum frames are manufactured in dedicated factories in the US, EU, and Asia. We carefully specify our materials and manufacturing processes and are ISO 9001:2015 certified. Because we produce pre-meshed, pre-tensioned SMT stencil frames in large quantities, we are able to deliver the best possible product at the best possible price.

Datum's stencil frames come with the mesh or mesh and steel pre-mounted and pre-tensioned. Our focus specifically on frame and foil manufacturing ensures consistent quality and performance for both the stencil manufacturer and the stencil user.

We are proud of our product and do not cut corners, substitute materials, or outsource our assembly operations. Our stencil frames are designed and built to perform, and we are happy to provide service and support 24/7 from one of our three global offices.



Datum Frame Construction

Our standard, space saver, Panasonic and high-tension frames use lightweight, age-hardened aluminium

Our poly mesh for standard tension mounting is 120-150 μm thread. Our stainless-steel mesh for high tension mounting is 85 μm multicore "thread" with 120 threads/cm.

We ensure the robustness of our epoxy bond strength by regularly testing it with extended ultrasonic cleaning cycles at elevated temperatures, using commercial chemistries. Reports are available upon request.

Available colours are silver or green. Green is often used as a visual indicator of a lead-free soldering process. Our green frames are anodized, and unlike powder coatings or paints, cannot be attacked by cleaning chemistries and will not contaminate cleaning baths.

Datum Standard Frames

- Use 24-29T mesh count polyester
- Tensioned to a minimum of 30N/cm
- Can carry Datum PhD or Tension FG steel foils

Datum High Tension Frames

- Use 48T mesh count stainless steel (301/304)
- Tensioned higher than 40 N/m
- Can carry Datum Tension FG steel foils

Datum Panasonic Frames

- Use 24-29T mesh count polyester
- Tensioned to a minimum of 30N/cm
- Can carry Datum PhD or Tension FG steel foils
- High tension Panasonic frames available upon request

Datum Space Saver Frames

- Reduce frame height from 38 mm (1.5") to 13 mm (0.5")
- Cut weight and storage space by over 60%
- Use the same mesh, tension, and foil materials as standard frames
- Not suggested for high tension applications

Datum Equivalent Cast (DEC) Frames

- Excellent alternative to cast aluminium frames
- Meshed DEC frame costs less than bare cast frame
- Aluminium tube reduces weight for easier handling in manufacturing facilities
- Lighter weight can cut shipping costs by as much as 50%

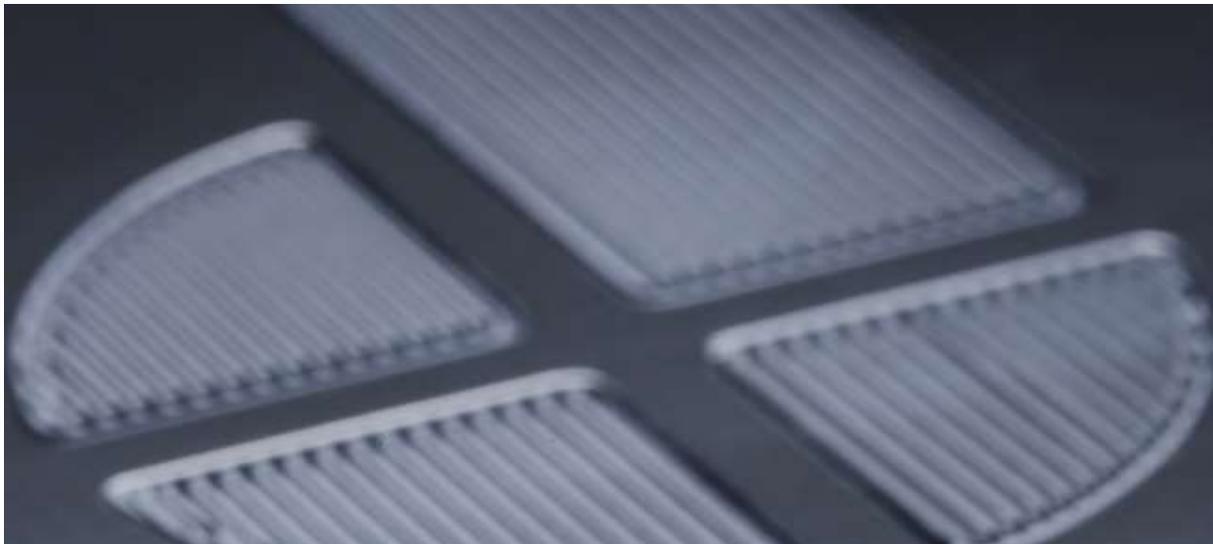
Datum is a leading producer of pre-meshed, pre-tensioned, high-quality SMT stencil frames because we focus on delivering the best possible product at the best possible price.

SMT Stepped Stencil

SMT Stepped stencils provide practical, workable solutions in several different applications:

- Multilevel SMT stepped stencils vary the foil thickness locally to improve paste release on fine features or increase volumes on large or through-hole prints
- 3-D cavity stencils have topographies on the contact side to fit down into PCB cavities
- BGA ball drop stencils often have “standoffs” built into the contact side to prevent sticky flux build-up on the stencil or in the apertures.
- Semiconductor ball drop stencils are similar to BGA ball drop stencils, but far more precise due to their small scale

SMT Stepped stencils can be created by a variety of manufacturing processes. Chemical milling was the traditional process for years but is now considered obsolete* due to the technological advancements in welding and micromachining.



Welding

Welding locally changes the thickness of the foil by cutting identical slugs from the base stencil foil and the same material of a different thickness. The replacement piece is then welded into place in the base stencil before laser cutting. This is a very economical process for step ups and step downs. All Datum materials are compatible with laser welding processes.

Micromachining

Micromachining, or micro milling, uses a very precise CNC positioning system with very small, hard cutting tools to remove steel without distortion or burrs. It is the most flexible stepping method, able to create unlimited shapes, patterns, wall profiles, cavities and contact side relief.

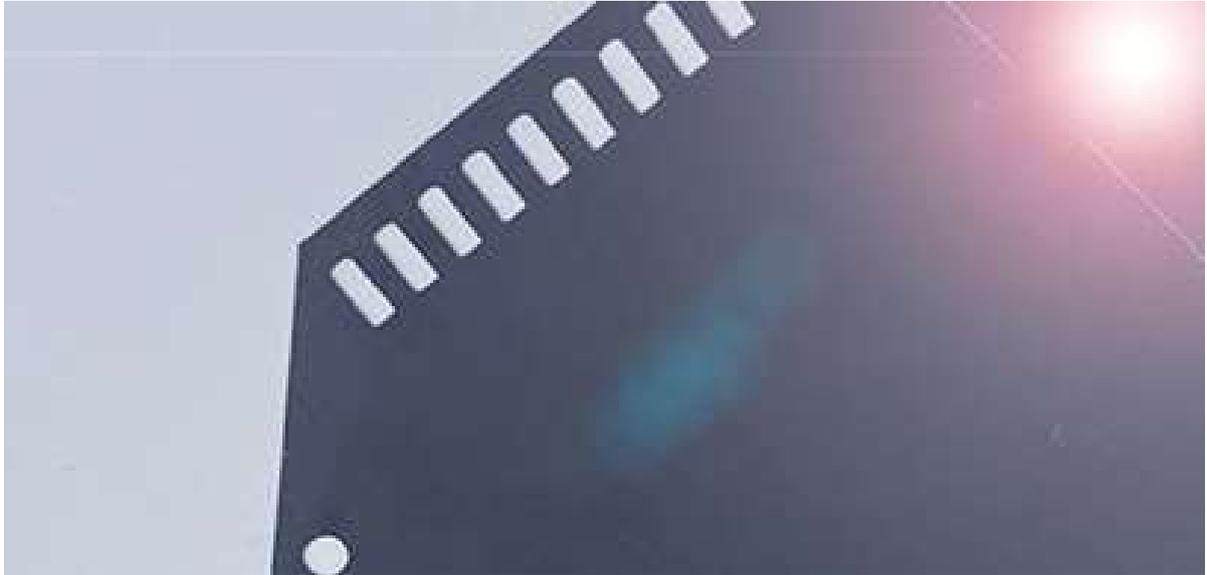
All Datum materials are compatible with micro milling; for walls as thin as 20 μm , Datum Tension is suggested.

Welding & Machining

Welding and machining can be used in combination to smooth transition walls, create print reservoirs or accommodate thickness differentials > 50 μm (2 mils).

SMT Border Holes

There are many makes and models of SMT screen printing machines, using a wide variety of different tensioning systems such as Vector Guard, Tetrabond, Apshen, Tetra, Zelflex, QTS, and Datum pre-meshed tension frames. Datum's precision, Stainless Steel SMT Stencil Foils are used in all these frame mounted, tensioning systems.



Some machines use Datum foils without a frame. To tension these foils, a border hole pattern must be cut around the perimeter of the stencil foil so that it can be held in the machines tensioning system ahead of screen printing.

Datum supply customers with thousands of foils each year with pre-cut border holes so they don't have to perform this operation themselves ahead of cutting the stencil or assembling their own frame system.

Purchasing foils with pre-cut border holes saves valuable processing time, increases manufacturing capacity, and improves efficiencies.



Solder Pallet Material

DCP – Datum’s wave solder pallet material is a premium ESD (Electro-Static Discharge) composite, pressed fibre, thermoset plastic which can be machined by manufacturers to create solder pallets or wave pallets used in wave solder machines as part of the PCB reflow process.



Solder pallets or wave pallets protect vital components during the reflow and wave solder process shielding the critical components from the high temperatures of the solder reflow machines. Our solder pallet material gives a reliable heat shield for heat sensitive and delicate components during the PCB component soldering process and with its ESD properties it protects critical components from electro-static charge.

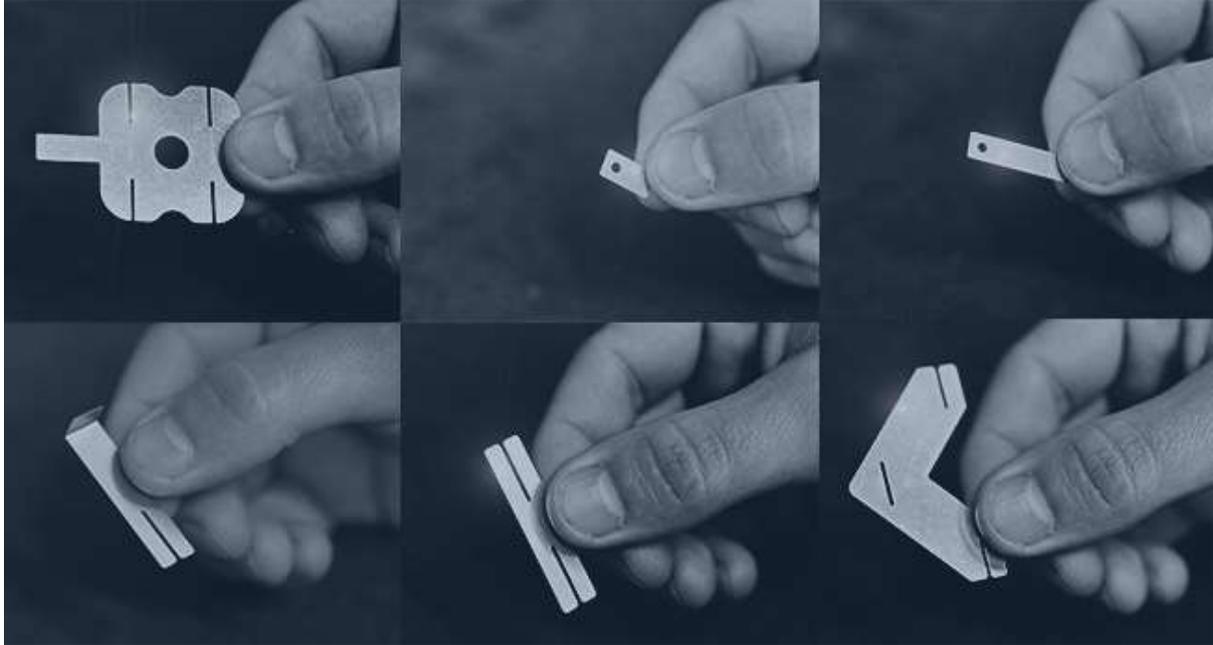
DCP is made of high temperature glass fibre material and high-performance epoxy resin, allowing minimal fixture renewal, and maximizing productivity. Combining excellent machinability with a long service life our solder pallet material delivers direct cost benefits to both the pallet fabricator and the PCB assembler. The high-performance material enables faster cutting speeds and longer tool life. Its chemically resistant matrix ensures its solid performance through repeated reflow and has a demonstrated life of up to 10,000 solder cycles.

Advantages of using Datum DCP Solder Pallet Material

- Pressed fibre material – Enables excellent machinability and less dust resulting in longer tool life. Companies that use layered fibre material are more likely to experience chipping and peeling when machining or cleaning.
- Can be machined/milled down to a 1mm wall and floor thickness
- Small fibre composition prevents warping from expansion when going from hot to cold
- Fast cooling cycle
- Smooth finish causes the flux to roll off the surface, requiring less cleaning, less harsh cleaning agents and resulting in increased pallet life cycle
- Black and grey colour types – For CNC optical recognition
- Thicknesses from 2mm to 12mm
- Wide variety of sizes and thicknesses in stock – Bespoke sizes to order

Battery Connectors

Datum offers a wide range of standard and custom battery connectors, battery crimps and battery tags in Stainless-steel, Nickel-plated steel, Nickel plated Copper and pure Nickel to suit your requirements and application.



Custom battery connectors for batteries can be made to order and cut on our precision laser line and specialized slitting and cutting equipment from coil or sheet. Datum manufacture custom battery connectors and custom earth rings to your specifications. We also offer a comprehensive crimping service via a trusted third party with the capability to crimp to any pre-crimped or preassembled wire.

Battery Components

We use Nickel 200/201 grade, which conforms to the ASTM B162 standard. It's commercially pure (99.6% and higher) with good mechanical properties and is resistant to a range of corrosive media. Our nickel strip and tags make excellent battery connectors because they have a low electrical resistance.

Most of the material we provide will be used as battery connectors, to link cells together either as a single tag from cell to cell or as a special etched or stamped tag, which can link multiple cells. The tags can be used as electronic parts, and in resistance to corrosion applications, like handling alkaline solutions and foods.

Battery Crimps

Nickel battery connectors, Nickel plated battery connectors and Nickel strip for battery connection are best suited as links for battery packs making it is easy to solder, spot or tag weld.

Datum battery crimps replace slow, expensive soldering processes in battery pack manufacturing. By working with our customers and understanding their processes, we supply our crimps to remove bottlenecks from critical areas of your production lines.



- Available wire sizes: 20-26 AWG, Standard 7/0.2mm, others available upon request.
- Crimp dimensions: 11mm spade and 16mm in length
- Material: Nickel plated stainless steel
- Crimps are available in reels of 10,000 pieces per reel.

BATTERY CRIMPS - TYPICAL CHEMICAL COMPOSITION (%)

Fe	C	Si	Mn	P	S
99.6	0.05	0.02	0.18	0.012	0.02

Battery Tags

Datum battery tags are available in nickel-plated steel and commercially pure nickel. All tags are produced at our facility, cut to order with our specialized slitting and cutting equipment. This enables us to deliver high-quality standard and custom-size tags at competitive prices with short lead times.

Custom tags are becoming increasingly popular as miniaturization and power electronics drive specialized shapes, formats, and load requirements. We can specialty etch or stamp custom shaped tags to ensure high-yielding and repeatable production processes.



NICKEL STRIPS & TAGS - TYPICAL CHEMICAL COMPOSITION (%)

	Nickel 200 / 201
Ni	99.5
Cu	0.001
Fe	0.07
Mn	0.25
C	0.01
Si	0.14
S	0.001
Mg	0.02
Ti	0.002

TYPICAL MECHANICAL PROPERTIES

Nickel 200 / 201	
Tensile Strength N/mm²	Max 130
Electrical Resistivity Ω/m	Min 50
Electrical Resistivity Ω/m	9.0 x 10 ⁻⁸

PURE NICKEL SPECIFICATIONS

- Typical chemical composition (%) Nickel 200/201: Ni 99.5 + trace elements
- Typical Electrical Resistivity: $9.0 \times 10^{-8} \Omega/m$
- Hardness: 90-120HV
- Thickness available: 0.127 mm (stock), 0.1 to 0.3mm; all meet industry standard tolerance of 0.01 mm

NICKEL PLATED STEEL SPECIFICATIONS

Typical composition (%): Fe 99.6 + trace elements

- Typical Ni plating thickness: 2 μm , both sides
- Typical Hardness: 80-110HV
- Thicknesses available: 0.127 mm (stock), 0.1 to 0.3mm; all meet industry standard tolerance of 0.01 mm

SIZES AVAILABLE

- Coils: 3, 3.2, 4, 4.8, 5, 6, 6.35 mm wide
- Tags cut to length on request
- Stock is 0.127 mm thick; others available upon request

We test all incoming material to assure it meets Datum quality standards before it is stocked, and use specialized equipment to assure repeatable, high-quality output from our wholly owned, ISO 9001:2015 certified production facilities.



Prototypes

Let Datum support your R&D (research and development) prototype requirements. We know tooling represents a significant cost to your business and often you cannot commit to producing the tooling until you are 100% certain your ideas will work. When you are developing new products, tools, or machinery it is not cost effective to get expensive tooling manufactured to trial a new part or test a theory.

This is where Datum can help you. Design to part, with minimum setup time, the ability to produce a one-off design, tens, hundreds, or thousands of parts with the flexibility to change designs in an instant.



Take advantage of our rapid prototyping, utilising our precision milling and laser cutting service to create bespoke thin metal prototypes and turn your ideas into fruition.

Research & Development

In the initial stages of product development prototypes can help a business evaluate variations prior to finalising a design. Prototype samples are a crucial part of R&D to test a concept and can avoid costly errors in mass production and speed up the product development process. Metal prototyping is used for product design across a wide variety of industries including the optical industry, automotive manufacturing, mechanical engineering, PCB manufacturing, robotics, aerospace, airline industry, reusable energy, oil & gas, medical, electronics, photographic & film equipment, construction, appliance manufacturing, transportation industry, battery technology, utility industries, and machine manufacturing.

Whether you are developing a new innovative product or improving an existing one let Datum work with you. Our experienced engineers will take your design and create model prototype parts to precise tolerances. Prototypes can minimise your R&D investment risk by providing a fast, effective, low investment solution. At product development phase you have the opportunity to fail – your prototype design can be refined and remade avoiding failure in production which would cost time, money, and reputation. At Datum we will build and rework your model for testing and evaluation until the prototype design is ready for implementation.

Services

Datum Alloys supply laser cutting, laser engraving, laser cut prototypes, CNC Machining, and subcontract services to a wide range of customers in a vast array of industries. If you require further information or if there is anything we can do to help, contact us to discuss your requirements.

Laser Cutting / Laser Cut Parts

Datum Alloys fully automated, bespoke coil to part precision laser cutting process with auto stacking, greatly increases the speed and efficiency of the manufacturing process and reduces the cost for our customers. We laser cut, thin, high-precision metal parts from coil or sheet. Our laser cut, custom metal components are made to short lead times and tight tolerances.



Our process produces scratch free, precision components. Laser cut, thin metal parts are a fast, efficient method of producing components as part of a manufacturing operation or prototype and development process. Datum's precision component manufacturing produces thin stainless-steel parts from 0.05mm up to 0.5mm thick. We can also micro laser cut other alloys such as Aluminium, Alloy 42, Nickel coated steel and Copper. Datum laser cut components are used in a wide variety of manufacturing applications, custom shims, micro spacers, battery applications, tags, connectors, marine industry, and technology companies.

We specialise in prototype laser cutting, precision stainless-steel components and stainless-steel substrates, offering companies the perfect solution for R&D and prototyping. Datum will turn your ideas into reality and help guide you through the development process and scale up to manufacturing quantities either on our laser or stamped part.

Key features include:

- Highly efficient process
- Components up to 690mm²
- All common grades and tempers of stainless steel between 0.05mm and 0.50mm
- Highly accurate and repeatable
- 3D features

We produce components with 3D features by micromachining; a second operation carried out after laser cutting that produces microscale features on your components. These processes together give you the precision and repeatability of laser cutting and micromachining and the flexibility of etching.

At Datum we use high grade metals for our laser cut parts including:

301 stainless steel (Datum Tension/Fine Grain)

- Extra hard stainless
- 0.05mm to 0.2mm thick

304 stainless steel (Datum PhD)

- Hard rolled stainless
- 0.02mm to 0.50mm thick

Nickel 200/201 Nickel coated steel; Nickel coated Copper

- Used for precision cut battery connectors, crimps, strips, and tags



Laser Machine Parameters

Parameter	Value
Max cutting area (Single sheet)	610mm x 610mm
Max cutting area (From Coil)	700mm x 700mm
Sheet width tolerance, full width	±0.50mm
Sheet width tolerance, Laser Cut (with offcuts)	±0.03mm per 200mm
Sheet length tolerance using Guillotine	±0.25mm
Sheet Squareness tolerance using Guillotine	±0.30mm
Sheet length tolerance Laser Cut (with Tabs)	±0.03mm per 200mm
Max material thickness	0.50mm
Min material thickness	0.05mm
X and Y Axis Positional tolerance	±0.05mm
X and Y Axis Combined Positional tolerance	±0.07mm
X and Y overall Feature dimensional tolerance	±0.02mm
Parallelism	±0.1 Deg
Perpendicularity	±0.2 Deg
Material Types	Metal
Laser beam diameter	<0.08mm

Laser Engraving

Datum offers a laser engraving service for our laser cut parts. Engraved parts are important for traceability and is a highly precise and economic way to permanently mark your parts. Add date codes, part numbers, serial numbers, or other identifying references directly to the surface of your components.

Laser engraved components ensure that parts can be identified even when operating in the harshest of environments where labels or ink markings could degrade, wear off or become illegible.



Benefits of Datum laser engraving:

- Precise – intricate designs can be accurately marked.
- Repeatable – produce single pieces or larger batch sizes.
- Permanent – vital for traceability and quality assurance.
- Legible – more legible than traditional engraving.
- Efficient – high speed laser engraving reduces marking time.

Laser engraving penetrates the surface area with each pulse removing a portion of the surface to leave a permanent mark. A permanent mark is vital for part traceability, where regulations require part identification to improve reliability and ensure part safety. Our laser engraving machine uses a laser beam delivered in short pulses to mark your parts providing precise and consistent results.

Laser engraving is the optimum marking option for parts expected to experience high wear.

Laser engraved parts are used in a variety of industries for:

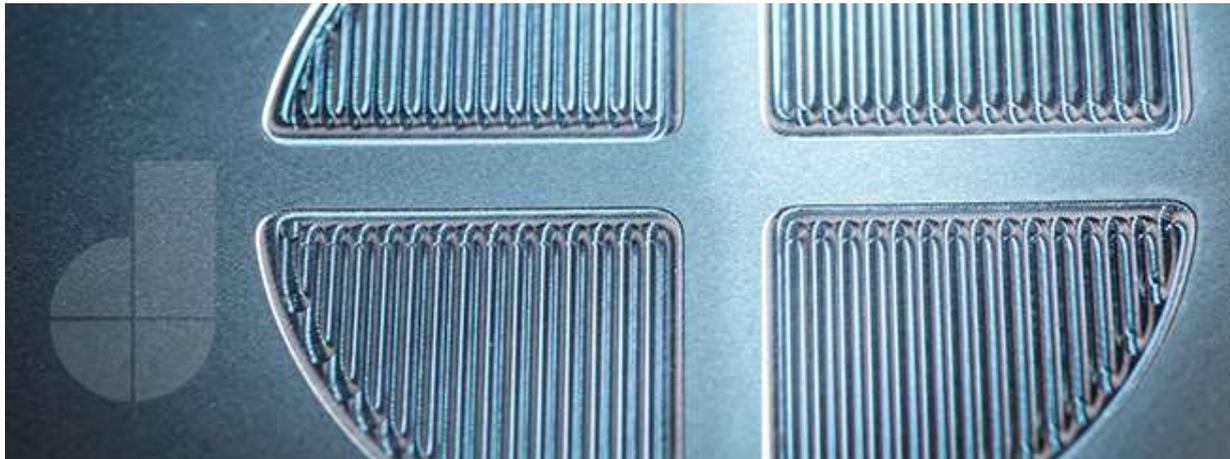
- Watch components
- Medical instruments
- Optical instruments
- Aerospace parts
- Electronic parts
- Automotive parts

CNC Machining

At Datum we provide CNC micromachining services, producing micro milled sheet metal and foil.

Our precision, CNC milling machine produces shapes, contours, and pockets in the surface of thin metal sheet and foil. This process is perfect for producing multi-level surface heights on foils used as stepped stencils for the application of solder paste to PCB's used in the SMT market.

Datum supplies customised micro-profiled sheet and foil ready to be laser cut to stencils, offering significantly improved levels of positional accuracy, surface finish and transition control for small geometries. A stepped stencil enables the SMT manufacturer to apply varied thicknesses of solder paste to a PCB, suitable for different size components in one pass during the screen-printing process.



Machined stepped stencils are an efficient more precise alternative to welded or chemically etched stepped stencils. In a world where micro-components are becoming smaller, having the control over the thickness and dimensions of foil depths plays a critical role in the SMT process.

With micro-CNC milling capabilities, Datum's small parts, CNC machining expertise enables us to produce high precision, small components to micron level tolerances. We also mill steps and pockets as part of our small parts CNC machining process, a second operation performed after laser cutting that produces microscale features on your components. These processes together give you the precision and repeatability of laser cutting and micromachining and the flexibility of etching.

CNC Milled Parts

Micro-profiling produces steps on the foil with the following benefits critical to the SMT process.

- Z- Axis dimensional accuracy within 5µm
- Complete edge control ensures a consistent angle and radius allowing apertures to be designed closer to steps and pockets.
- A more gradual transition in stepped areas can extend the life of the squeegee and stop paste build up within the transition.
- Surface finish approaching or the same as virgin cold roll PHD or Tension stencil materials. Guaranteed < 0.50 µm but typically < 0.30 µm.

These features reduce variability within the print process and help deliver certainty.

UK 3 Axis Milling Machine Parameters

Parameter	Value
Max material thickness	2mm
Min material thickness	0.05mm
Z Depth Tolerance	$\pm 0.005\text{mm}$
X – Y Plane Circularity	0.005mm
Surface finish	$<0.25 \text{ Ra}$

US 3 Axis Milling Machine Parameters

Parameter	Value
Max material thickness	2mm
Min material thickness	0.05mm
Z Depth Tolerance	$\pm 0.005\text{mm}$
X – Y Plane Circularity	0.083mm
Surface finish	$<0.20 \text{ Ra}$



Subcontracting

We do not have to supply the metal if all you need is our expertise. Take advantage of our subcontract handling, cutting, laser and milling capabilities and let us process your material for you. From coil to coil, coil to sheet, sheet to component. We can receive your metal, process, and return as required. We have the tools, technology, and expertise to handle and process your metal to your requirements.



Datum can produce components to your specifications without you having to invest in expensive factory space, machinery, staff, and training. Let Datum expand your business by utilising ours.

Datum Expertise

Datum Alloys specialise in the supply, handling, cutting, and machining of thin metal sheet and foil to tight tolerances. Our thickness controls and tolerances lead the industry. We only supply the best performing materials and provide products with the highest degree of precision.

With more than 25 years' experience, Datum Alloys have been at the forefront of our industry, delivering tools and products to manufacturers, innovators, and technology developers.

Datum has a proven track record with rigorously tested products and services, industry-leading delivery times and optimal results.

With locations in the UK, USA, and Singapore we can service our customers and maintain strong relationships wherever they are in the world.

Precision

Our thickness controls and tolerances lead the industry. We are the only company to guarantee a 2% thickness tolerance on our advanced stainless-steel foils. We only supply the best performing materials and provide products with the highest degree of precision.

Efficiency

We offer the fastest delivery times in the industry and regularly ship on the same day. All orders are shipped within 48 hours, and this is a metric we continue to invest in and improve on.

Guaranteed Performance

All Datum products are rigorously tested before coming to market, and this test data is available. Our suppliers are controlled by our strict purchasing specifications and audits. We test all incoming material and outgoing products to ensure they meet our standards, and we guarantee performance for our customers. We are ISO 9001:2015 certified.

A Team of Leaders

We are a team of industry leaders and professionals who take responsibility for, and commit to, everything we do. Datum has multiple facilities to service any customer with the same product anywhere. Our UK office was established in 1993 and has been an industry leader ever since. Our US office was established in 2010 to service the US, Canada and LATAM markets.

These locations have allowed us to grow long term relationships and retain our customers. We have worked with our core customers for more than 20 years. Complexity is where we thrive, so bring us your hardest issues, most challenging tool design or process problems to solve.



Contact

UK

Datum Alloys Ltd

Unit 9 Torr Hill Park
Torr Quarry Industrial Estate
East Allington, Totnes
Devon, TQ9 7QQ

Call: +44 (0) 1548 855 900

Email: uk.sales@datumalloys.com

USA

Datum Alloys Inc

33 Lewis Road
Binghamton, NY 13905

Call: +1 607 239 6274

Email: us.sales@datumalloys.com

Singapore

Datum Alloys Pte

One Raffles Place Tower 2
Level 19, Singapore, 048616

Call: +65 3157 0394

Email: sg.sales@datumalloys.com