



CUSTOM-ENGINEERED TUBES
BENDING AND CONNECTING TUBE PROFILES



BENDING AND CONNECTING TUBE PROFILES

Timeless Tube offer bending and joining solutions for circular and non-circular tube profiles across a range of radii and geometries.

Our capabilities include:

- Fixed radius bending
- Ring rolling for continuous curves, coils and compound bends
- Folded and pressed tube
- Bespoke tooling and custom bending solutions
- Cast connectors and mechanical joiners

Our technical team can help identify the most suitable fabrication method for your application.

Please email info@timelesstube.com or phone +44(0)1202 666560 for further assistance or to request a meeting.



BENDING NEW PROFILES AND RADIUSES

We can also develop new tooling or modify existing machine settings for profiles or radiuses not listed in this guide.

Purpose-designed tools are typically machined from hardened steel to support controlled, reliable bending across both bespoke and production applications.

We design and manufacture tooling and jigs in our workshop: from large, custom-built jigs that maintain geometry over long or complex sections, to compact fixed-radius bending machines developed for precision tubes.

Early consultation during the design stage can help optimise bend radii, tooling and fabrication efficiency. If specialist mandrel bend tooling is required this may involve longer lead times.



FIXED RADIUS BENDING

Fixed radius bending is used to achieve precise bends with consistent radii and clearly defined bend positions.



Laboratory water dispenser conduits (flat-sided oval tube, stainless steel 316L, 39 x 19 x 1.5mm)



Marine handrail (oval tube, stainless steel 316L, 61 x 37 x 2mm)



Yacht grab rail (flat-sided oval tube, stainless steel 316L, 62 x 31 x 2mm)



Yacht grab rail (flat-sided oval tube, stainless steel 316, 62 x 31 x 2mm)



Marine handrail (oval tube, stainless steel 316L, 39.5 x 20.5 x 2mm)



Aerospace conduit (oval tube, stainless steel 316L, 14.6 x 7.8 x 1mm)

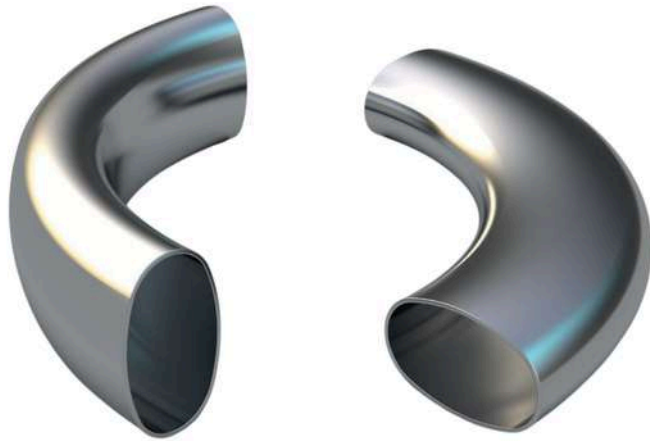
FIXED RADIUS BEND TOOLING CHART

We hold fixed radius bend tooling for some of our most popular oval profiles.

We typically recommend using tube with a wall thickness of 2mm or greater to reduce the risk of necking or deformation.

A Plane

Minor-axis bend (weak-axis bend / narrow-face bend / “the easy way”)



B Plane

Major-axis bend (strong-axis bend / wide-face bend / “the hard way”)

Profile Size	A Plane CLR (Centreline Radius)	B Plane CLR (Centreline Radius)
Oval 30.5 x 17.5mm	90mm, 115mm, 150mm	135mm
Oval 39.5 x 20.5mm	90mm, 100mm, 145mm	140mm
Oval 47 x 25mm	100mm	138mm, 180mm
Oval 61 x 37mm	102mm, 130mm, 147mm, 163mm, 265mm	135mm, 163mm, 180mm, 265mm
Oval 71 x 45mm	200mm	225mm
Oval 86 x 58mm	170mm	200mm, 320mm, 250mm
Oval 121 x 76mm	325mm	
Flat-sided oval 14.8 x 7.5mm		75mm
Flat-sided oval 62 x 31mm		250mm

Custom tooling for alternative centreline Radius (CLR) bends

We can often custom-make fixed radius tooling if your required centreline radius (CLR) is $2.5 \times$ or greater than the tube diameter in the plane being bent. Ask our technical team about bespoke tooling options.

Where a tighter bend is required (CLR less than $2.5 \times$ the tube diameter), mandrel bending may be more appropriate.

Custom tooling for new profiles and sizes

Please contact our technical team to discuss your requirements for alternative profiles and sizes.

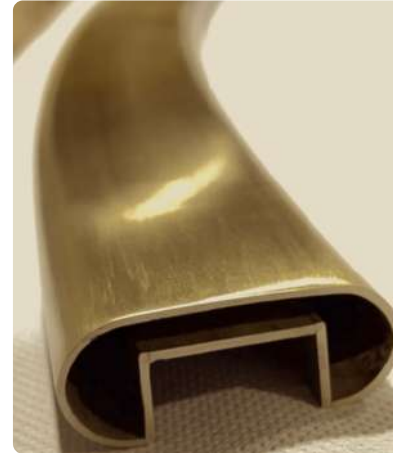


RING ROLLING FOR CONTINUOUS CURVES

Ring rolling is used to bend tubes with large radii, creating smooth, flowing geometry such as continuous curves and full rings. It is ideal for long handrail sections since there is no limit on the length of tube that can be bent.



Feature air vent at Selfridges, London (oval tube, stainless steel 316L, 61 x 37 x 2mm)



Slotted handrail (flat-sided oval tube, stainless steel 316L, 75 x 25 x 2mm)



Handrail (radiused rectangle tube, stainless steel 316L, 58.5 x 34 x 2mm)



Sunlounger for superyacht (oval tube, stainless steel 316L, 47 x 25 x 2mm)



Bar stool (oval tube, stainless steel 316L, 23.5 x 13.3 x 1.5mm and 39.5 x 20.5 x 2mm)

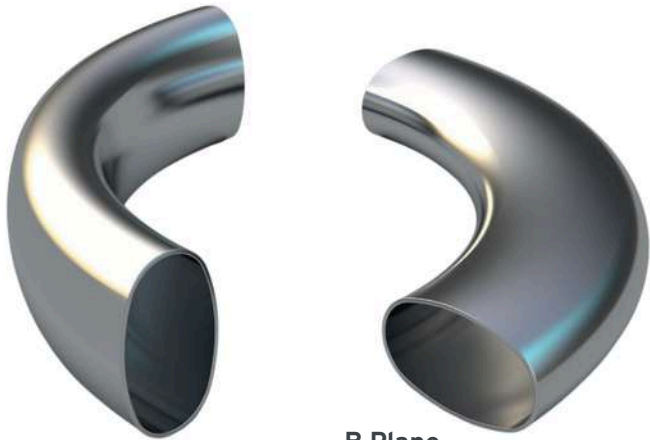


Marple Aqueduct, Bisca Architects (flat-sided oval tube, stainless steel 316L, 62 x 31 x 3mm)

RING ROLLING BEND TOOLING CHART

A Plane

Minor-axis bend (weak-axis bend / narrow-face bend / "the easy way")



B Plane

Major-axis bend (strong-axis bend / wide-face bend / "the hard way")

Profile Size	A Plane Ring Rolling	B Plane Ring Rolling	Rolling (No Plane)
Oval 30.5 x 17.5mm	✓	✓	
Oval 39.5 x 20.5mm	✓	✓	Angled at 30°
Oval 43 x 30mm	✓	✓	
Oval 47 x 25mm	✓	✓	
Oval 61 x 37mm	✓	✓	
Oval 71 x 45mm	✓	✓	
Flat-sided oval 51 x 26mm	✓	✓	
Flat-sided oval 62 x 31mm		✓	
Flat-sided oval 75 x 25 x 2mm		✓	
D-shaped 50 x 18mm		✓	
D-shaped 65 x 28mm		✓	
Round 12.7mm (1/2")			✓
Round 9.525mm (3/8")			✓
Round 25.4mm (1")			✓
Round 31.7mm (1-1/4")			✓
Round 38.1mm (1-1/2")			✓
Round 60mm			✓

Custom tooling for new profiles and sizes

Please contact our technical team to discuss your requirements for alternative profiles and sizes.



COMPOUND CURVES

Compound curves (bends that transition between two or more planes or multiple radii in a single plane) can also be produced using our ring rolling machinery.

Our fabricators often use 1:1 printed templates to achieve compound bends for larger assemblies such as boat rails (see further information on 'Drawings and 1:1 printed templates').



COILING

We produce coiled tube forms by continuing the rolling process beyond a single ring. Our coils are typically formed from smaller diameter tubes for use in heat transfer and food and pharmaceutical processing.

Coiling is currently available for circular tubing and a limited range of flat-sided oval tubing in both planes.

Minimum coil diameters depend on the tube profile, wall thickness and material grade; please contact our technical team to discuss your requirements.



Heat transfer coils in A and B Planes (flat-sided oval tube, stainless steel 316L, 23 x 12 x 1.5mm)



Heat transfer coils in A and B Planes (flat-sided oval tube, stainless steel ASTM 269, 14.6 x x 7.5 x 1mm)



Welded double coil unit for medicine manufacturing machinery (circular tube, stainless steel 316L, ¼" x 0.035")

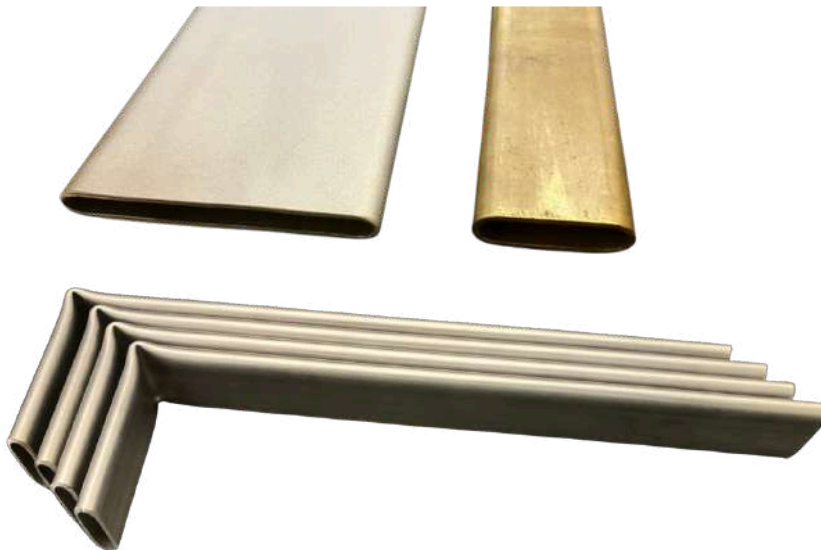


FOLDING AND CONTROLLED COMPRESSION

We can offer acute-angle folding and controlled compression of tubular profiles using presses and bespoke tooling.

Unlike heavy solid sections, folded tube profiles can provide lightweight yet rigid structural elements for frames, supports, brackets and internal assemblies. Folding creates compact forms while retaining many of the weight-saving advantages of hollow sections. This technique is most suited to functional rather than decorative applications, where a smooth radius bend is not required.

Controlled compression allows selected areas of a tube to be flattened to a repeatable dimension, creating integrated fixing points, attachment lugs and assembly features directly within the component. When the opposing walls are brought together, holes can be machined through both faces to provide an economical bolt-through fixing without the need for additional welded brackets or secondary components. The result can be reduced part count, simplified fabrication and more efficient assembly.



Internal wall supports (flat-sided oval tube, stainless steel 304, 24 x 10 x 1.5mm)



Welded and pressed car interior support brace (flat-sided oval tube, aluminium 6060 T6, 36 x 13.5 x 1.5mm)



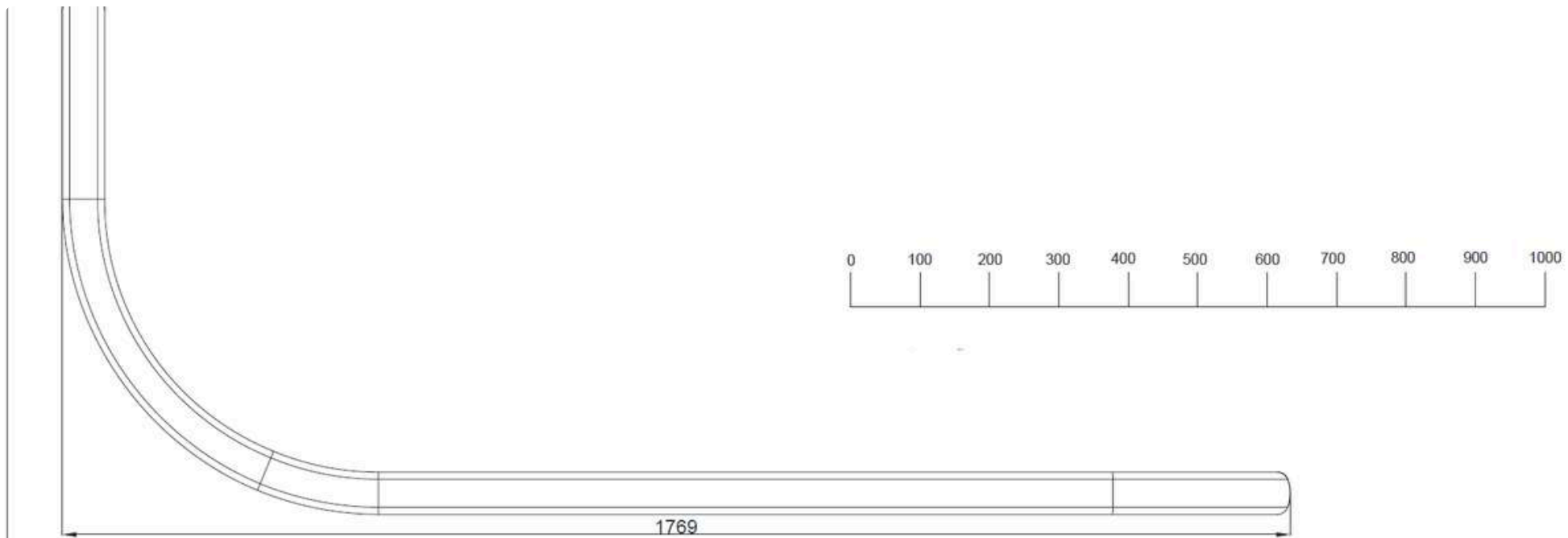
DRAWINGS AND 1:1 PRINTED TEMPLATES

If you require a quotation we ask that you send us drawings showing your required bends. Hand-drawn sketches that detail dimensions and the radius/radii will usually suffice if drawings are not available.

Our fabricators work from full-size printed drawings when producing the bends.

For ring rolling applications, we ask clients to supply 1:1 printed templates. We use these true-to-size references as a visual guide to check against throughout the forming process, ensuring an accurate, smooth and consistent curve.

Printed drawings are also required for fixed-radius bends. In most cases, we can produce these in-house directly from your supplied PDF files.



Example of a fabrication drawing to be printed at a 1:1 ratio, used as a guide during ring rolling.



ELBOW AND STRAIGHT CONNECTORS

Our cast stainless steel 90° elbow connectors create angled transitions between tube sections when bending is not practical, or where a crisp, architectural joint is desired.

We stock a range of elbow connectors and straight connectors for some our most popular tube profiles.



Balcony railing, California (oval tube, stainless steel 316L, 47 x 25 x 2mm with B Plane connectors)



Lockable handle on yacht (oval tube, stainless steel 316L, 23.5 x 13.3 x 1.5mm with A Plane connectors)



Various oval tube A Plane and B Plane elbow connectors, stainless steel 316L



Handrail, 110 William St, NYC (oval tube, stainless steel 304, 47 x 25 x 3mm with A Plane and B Plane connectors)



Sculpture, Cartier (oval tube, stainless steel 316L, 47 x 25 x 2mm with A Plane connectors)



Coffee table, Synergigi, Canada (oval tube, stainless steel, 47 x 25 x 1.5mm with A Plane connectors)

CAST CONNECTORS (WITH CLR DIMENSIONS)

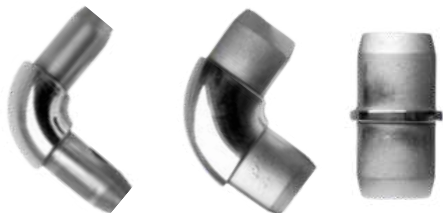
Manufactured from 316L ‘marine grade’ stainless steel using an investment cast process, our thick-walled connectors provide a strong, cost-effective joining method.

Connectors can be cast in other profiles and materials, provided that the order size and lead time is sufficient. You may find our mechanical joiners, machined lap joints or mitre-cutting service more appropriate for lower volumes, or when lead time is critical.

B Plane elbow
Major-axis / horizontal



A Plane elbow
Minor-axis / vertical



Profile Size	90° A Plane	90° B Plane	Straight Connector	End Cap
Oval 23.5 x 13.3 x 1.5mm	✓ 10.65mm CLR	✓ 15.75mm CLR	✓	✓
Oval 30.5 x 17.5 x 1.5mm	✓ 12.75mm CLR	✓ 19.25mm CLR	✓	✓
Oval 39.5 x 20.5 x 1.5mm	✓ 19.75mm CLR	✓ 29.25mm CLR	✓	✓
Oval 47 x 25 x 1.5mm	✓ 22mm CLR	✓ 33mm CLR	✓	✓
Oval 61 x 37 x 2mm	✓ 28mm CLR	✓ 40mm CLR		✓
Oval 71 x 45 x 2.77mm	✓ 32.5mm CLR	✓ 45.5mm CLR	✓	✓
Oval 86 x 58 x 3mm	✓ 46mm CLR	✓ 60mm CLR	✓	✓
Oval 121 x 76 x 3mm	✓ 76mm CLR	✓ 98.5mm CLR	✓	✓
D-shape 65 x 27 x 2mm		✓		
D-shape 99x 38 x 2mm			✓	

Cast connectors may be supplied with a mill finish or with a mirrored finish on visible areas: please ask for further details on each specific connector.

FABRICATING ELBOW CONNECTORS

Further fabrication is required to join cast connectors to the tubing due to the tight interference fit design. In most instances the connectors will need minor fettling or grinding, and/or tapping with a soft hammer.

After fitting, welding and polishing is necessary if you want to achieve a watertight connection and a seamless appearance.



Join marks can be removed by blending out the welding, then progressively polishing in stages. We recommend applying a grained finish prior to mirror polishing if you require an ultra-smooth, highly reflective finish.

Our specialist tube fabricators can supply your tubes with pre-fitted connectors, TIG-welded and finished according to your specifications: please ask for a quotation.



Mitre-joining for compound joins and alternative angles and tube profiles

For joins less than 90°, cast connectors can be mitre-cut at the required angle then TIG-welded together. A Plane and B Plane connectors can also be mitre-cut and welded together to create compound joins.



Yacht balustrade (oval tube, stainless steel 316L, 47 x 25 x 1.5mm with A Plane elbow connector, mitre-cut at 45° then welded and polished)

Our fabricators can mitre-cut and weld tube without using cast connectors if they are not available for your chosen tube profile.



Yacht balustrade (oval tube, stainless steel 316L, 47 x 25 x 1.5mm with A and B Plane connectors, mitre-cut at 45° then welded to form a compound curve)



Balcony railing corner (D-shaped tube, 65 x 28 x 2mm, stainless steel 316L, mitre-cut then welded without connector)



Lift car grab rail (flat-sided oval tube, stainless steel 304, 99 x 38 x 1.5 mm, mitre-cut at 45° then welded without connector)



DRY-FIT MECHANICAL CONNECTOR

Mechanical connectors can be custom-made for tube profiles of all sizes and shapes, for both curved and straight sections.

Ideal for when on-site welding is not practical, these dry-fit joiners provide a discreet, neat and secure connection.

Developed by Timeless Tube, the unique connector features a short spigot that slots into a tapered pocket, providing exceptional strength. End plate fixings prevent the flaring, thinning and looseness often seen with many handrail connectors, while unobtrusive grub screws provide a smoother finish than protruding countersunk screws.

Shadow gap inserts of varying thicknesses allow flexibility during installation.



CNC-MACHINED LAP JOINT

This weld-in connection uses precision CNC machining to create a hybrid spigot and lap joint for custom profiles. An alternative to the dry-fit mechanical joiner, this joint is also useful for instances where onsite welding is not an option, such as yachts and fit-out projects taking place in working buildings.

Machined spigot inserts fit inside the tube, shaped to match the internal geometry for a strong, accurate fit. Self-aligning, the joint has a profiled mating face that sits seamlessly into the adjoining section.

Discreet countersunk fasteners are used to secure the joint, allowing you to bolt railings together onsite.



CNC-machined lap joint for oval tube assembly (oval tube, stainless steel 316L, 61 x 37mm)



TUBE-END FORMING FOR COMPATIBILITY WITH STANDARD FIXTURES

Timeless Tube have developed a method of reforming non-circular profiles, such as oval and radiused square tubes, back to circular tube at the ends. This allows you to use standard off-the-shelf circular tube fittings while benefitting from the aesthetics and ergonomics of distinctive shaped tube profiles.

Our tube-end forming machinery is highly flexible, allowing our engineers to achieve very specific ODs to fit with your clamps, connectors and brackets.



Oval tube with ends formed to 33.7mm OD to fit standard handrail bracket (stainless steel 316L, 61 x 37 x 2mm)



Effector switch (flat-sided oval tube with round tube end, stainless steel 304)



Radiused square tube with ends formed to 33.7mm OD round tube (stainless steel 316L, 34.5 x 34.5 x 1.5mm)





+44(0)1202 666 560
info@timelesstube.com
www.timelesstube.com

UNIT 3, 14 ABINGDON ROAD
NUFFIELD INDUSTRIAL ESTATE
POOLE, DORSET, BH17 0UG

