



**Leading the  
way in *all-electric*  
tube manipulation**

**UNISON**  
INTELLIGENT TUBE TECHNOLOGY

**Tube Bending · Laser Cutting · Wire Bending · Automation & Control · Global Service · Software & Support**



## **One family. Three world-class machine tool brands**

Unison Ltd is the UK's leading manufacturer of tube and pipe bending machines. We invented ultra-precise, all-electric tube manipulation in the 1990s. Until then, the world had relied on the slow-to-setup, hydraulic machines of the day, where accuracy and repeatability were often affected by oil temperature and operator skill.

Today, we build the world's largest range of powerful, ultra-precise, all-electric models for diameters ranging from 4 mm to 275 mm, including single-stack, multi-stack, twinhead, left & right and pinball machines. We export to more than 20 countries and to sectors as wide ranging as motorsport, marine, oil & gas, aerospace, general manufacturing, subcontracting, architecture and energy, including SMR.

For organisations that carry out repetitive tube bending tasks, we offer a range of advanced, electrically controlled, hydraulically operated dual-stack machines. Our recent acquisition of Pneufarm Machines Ltd has brought high-quality wire and small-diameter tube bending machines to our customers.

While through Nukon Lasers UK, we offer Nukon's advanced, highly accessible, European fibre laser cutting machines to customers in the UK and Ireland.

Our Unibend CNC software is widely seen as the most user-friendly control system for tube and pipe manipulation. While our Opt2Sim tube bending simulation software and tube bending app simplifies the most complex of tube bending tasks.

Include our extensive tooling designs and 4- and 5-axis machining capability, and you can count on Unison to be your true partner for even the most challenging of tube bending applications. Add considerable consumable tooling stock holdings of mandrels and wipers in the UK and US - supported by prompt global delivery - and it's easy to see why customers around the world put their trust in us.

One family. Three world-class brands. All supported by the highest levels of service, support and software. That's Unison.



## **The Unison family of companies:**



**Unison Ltd** The inventors of all-electric tube manipulation  
[www.unisonltd.com](http://www.unisonltd.com)



**Nukon Lasers UK** The official UK and Ireland distributors for Nukon's European-built fibre laser machines  
[www.nukonlasers.co.uk](http://www.nukonlasers.co.uk)



**Pneufarm Machines Ltd** At the forefront of wire and small-diameter tube bending technologies  
[www.pneufarm.com](http://www.pneufarm.com)

We are proud members of:



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# Rewriting the rules: 50 years of intelligent tube technology

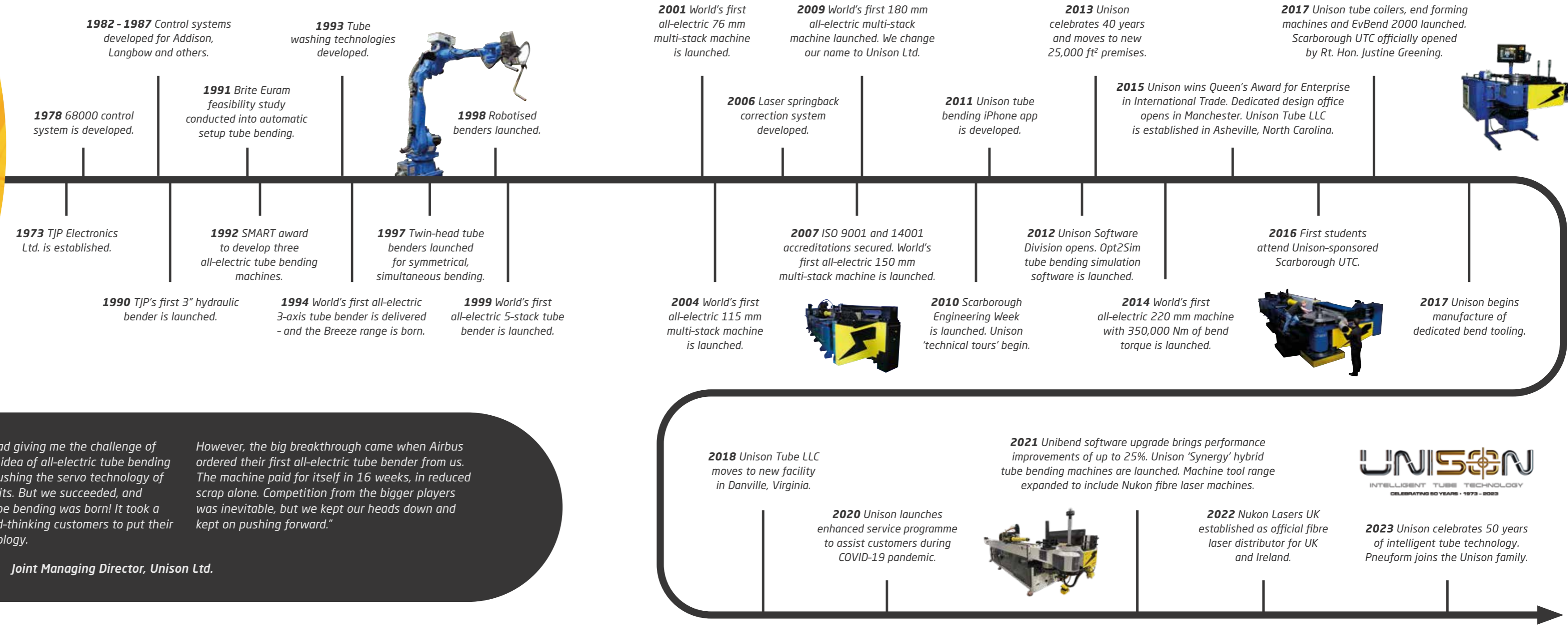
Established in 1973, we began by providing control systems expertise to a number of UK-based tube bending machinery firms. Believing there was a better, more precise way of bending tube than by hydraulic operation, in the late 1980s we set out to create an all-electric tube bending machine. Prototypes were built, a patent was taken out, and the servo systems of the day were pushed to their limits. But it was all worth it. Because, in 1994, we unveiled the world's first all-electric 3-axis tube bender. Ultra-precise, all-electric tube manipulation had arrived and, as you can see from the timeline, more world-firsts followed.



"I remember my dad giving me the challenge of bringing his crazy idea of all-electric tube bending to life. We were pushing the servo technology of the day to the limits. But we succeeded, and right-first-time tube bending was born! It took a number of forward-thinking customers to put their faith in our technology.

**Alan Pickering** Joint Managing Director, Unison Ltd.

However, the big breakthrough came when Airbus ordered their first all-electric tube bender from us. The machine paid for itself in 16 weeks, in reduced scrap alone. Competition from the bigger players was inevitable, but we kept our heads down and kept on pushing forward."



# Inspiring future generations

## Supporting the future of great engineering

As the inventors of ultra-precise, all-electric tube manipulation, as well as many other firsts in tube and pipe technology, we know only too well how engineering, software and design expertise - combined with a desire to innovate - can lead to great things.

That's why we're passionate about inspiring as many young people as possible to become the mechanical, electrical, software and design engineers of tomorrow and, by doing so, putting them on the road to well-paid, worthwhile careers.

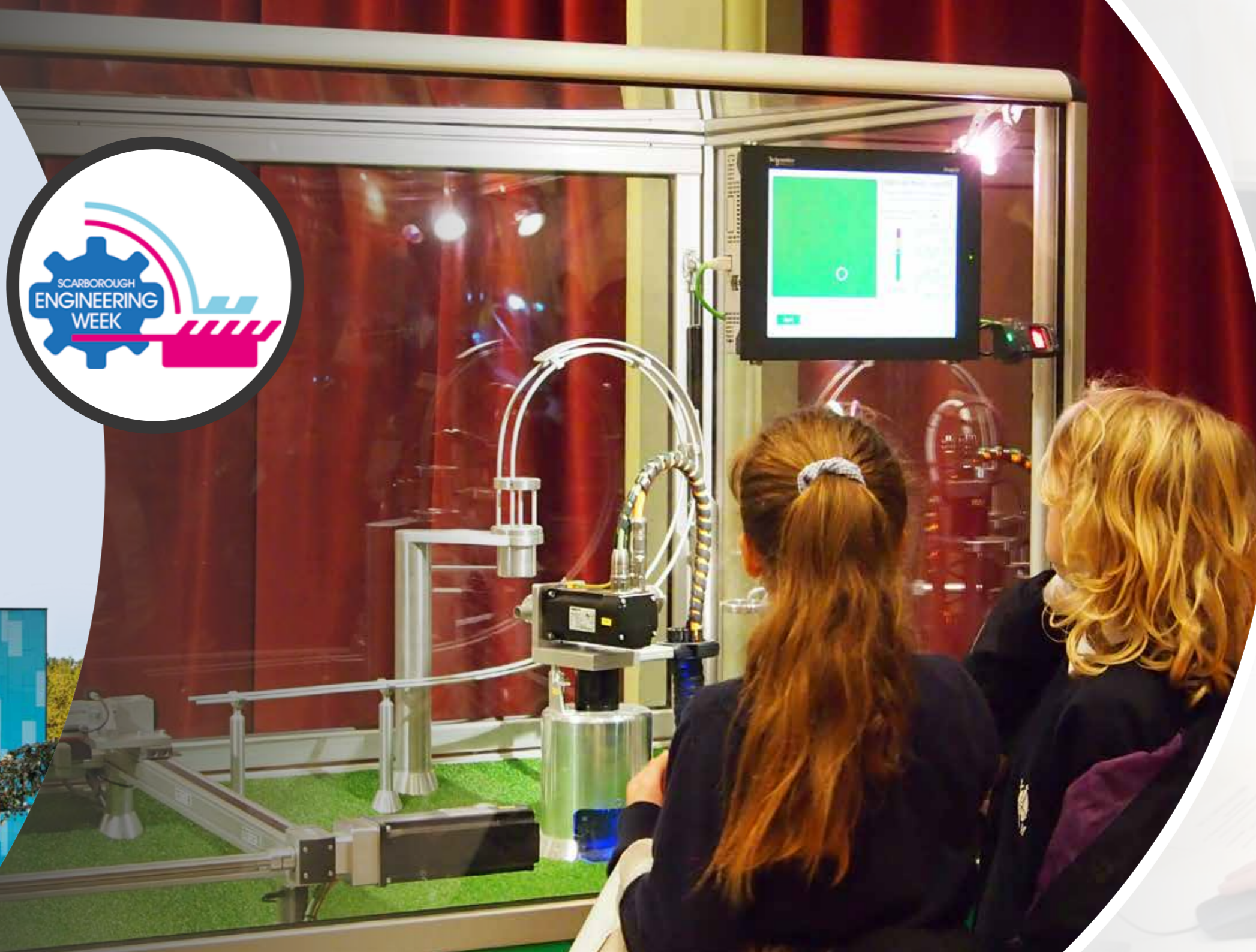
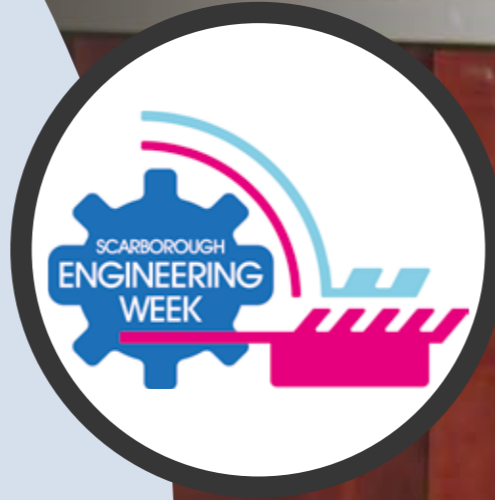
It's why we established Scarborough Science and Engineering Week in 2010, inspiring over 40,000 school children over the years to consider STEM (Science, Technology Engineering, Mathematics) careers. And why we were the driving force behind the creation of Scarborough's University Technical College in 2017 - the college where most of our higher-level apprentices originate from.

It's also why you'll see us at numerous apprenticeship events, including those held locally by Derwent Training Association - and why, every year, we aim to take on a number of young people through modern apprenticeship programmes.

Today, just like countless other employers, we face an ongoing challenge to recruit skilled, work-ready employees.

However, we're proud to say that the young people who join us as apprentices tend to stay with us for the long-term - growing in expertise and advancing to more senior roles within the Unison family of companies.

In fact, almost a third of our current team joined us at apprentice level. And that clearly says something about our belief in providing first-rate training, development and opportunities for progression.



***"We're passionate about inspiring as many young people as possible to become the mechanical, electrical, software and design engineers of tomorrow."***



# Unison Breeze

Ultra-precise, *all-electric*  
tube and pipe manipulation



## A world first, and still the world's best\*

*It may be 30 years since the first British-built, all-electric Unison Breeze tube bending machine was launched in 1994. But we haven't rested on our laurels. Far from it. Year in, year out, we continually innovate to ensure that every new Unison Breeze machine continues to set the standard.*

*With precision operation, all-electric architecture, user-friendly programming, rapid tooling changes and uncompromising levels of accuracy and repeatability, our Breeze machines have redefined tube manipulation.*

*Widely regarded as the ultimate tube bending machines for specialist manufacturers and subcontractors, Unison Breeze models deliver right-first-time repeat tube manipulation, or immediately after producing a single trial part.*

*Intelligent solutions, such as our rise and fall pressure die, which allows tools of different radii to be used on a part during a production cycle, offer significant operational savings. As does each Breeze machine's low power consumption - a significant factor with today's high energy prices.*

*Add exceptional power, a major advantage when looking to achieve high-quality thin wall bending, along with robust build quality, and Unison Breeze machines make light work of challenges where other tube benders may struggle.*

\*In our opinion, and the opinion of Unison customers around the globe.

## Unison Breeze At a glance

- *British-built, all-electric CNC tube and pipe bending machines*
- *Models from 4 mm (5/32") to 275 mm (10" pipe)*
- *User-friendly Unibend CNC for right-first-time results, or immediately after bending a trial part*
- *Single-stack, multi-stack, twinhead and pinball machines*
- *Opt2Sim 'design to manufacture' CAD simulation software*
- *Single machines to fully automated robotised work cells*
- *Automatic setup for rapid tooling changes and increased productivity*
- *Exceptional power and robust mechanical design*
- *Unique mechanical and software design for easy manipulation of difficult materials*
- *Laser springback correction for small batch correction and reduced waste*
- *Up to 90% lower power consumption, noise and scrap compared to traditional hydraulic tube bending machines*
- *From the inventors of all-electric tube manipulation*

Discover more:

[www.unisonltd.com](http://www.unisonltd.com) [sales@unisonltd.com](mailto:sales@unisonltd.com)

# At a glance. Unison Breeze: the world's most extensive range of tube and pipe bending machines

\* Bending capacity based on Unison Tube Bending Application App  
 \*\* Standard specification with variants available  
 Specifications are correct at time of going to print but subject to change



Size	25 mm L&R	35 mm L&R	16 mm (1")	20 mm	25 mm (1")	30 mm (1.25")	40 mm (1.5")	50 mm (2")	65 mm (2.5")	80 mm (3")	90 mm (3.5")	100 mm (4")	130 mm (5")	150 mm (6")	180 mm (7")	220 mm (8")	273 mm (10")	Pinball 30 mm (1.25")	Pinball 50 mm (2")	Pinball 90 mm (3.5")	
<b>Bend Direction</b>	Right and Left	Right and Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right or Left	Right and Left	Right and Left	Right and Left	
<b>Bending Capacity*</b>	25 x 1.6 mm	35 x 2.4 mm	16 x 1.6 mm	20 x 1.6 mm	25 x 1.6 mm	30 x 2.5 mm	40 x 2.5 mm	50 x 2.0 mm	65 x 1.5 mm	80 x 1.6 mm	90 x 2.0 mm	100 x 2.0 mm	130 x 2.5 mm	150 x 3.0 mm	180 x 3.5 mm	220 x 4.0 mm	273 x 4.0 mm	30 x 1.65 mm	50 x 2.0 mm	90 x 2.0 mm	
<b>Bend Torque</b>	1,000 Nm	2,900 Nm	400 Nm	600 Nm	1,000 Nm	1,600 Nm	3,500 Nm	5,500 Nm	8,000 Nm	17,500 Nm	23,000 Nm	30,000 Nm	55,000 Nm	92,000 Nm	165,000 Nm	350,000 Nm	660,000 Nm	1,500 Nm	5,500 Nm	23,000 Nm	
<b>Servo Controlled Follower</b>	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	180° at 2D CLR	90° at 2.8D CLR	180° at 3D CLR	180° at 3D CLR	180° at 3D CLR	
<b>Collet Capacity</b>	25 mm	35 mm / 38 mm	16 mm	20 mm	25 mm	30 mm	40 mm	50 mm	65 mm	80 mm	90 mm	100 mm	130 mm	150 mm	180 mm	220 mm	273 mm	30 mm	50 mm	90 mm	
<b>Axis Speed (Max) Feed</b>	1,200 mm/sec	1,200 mm/sec	1,200 mm/sec	1,200 mm/sec	1,200 mm/sec	450 mm/sec	438 mm/sec	1,200 mm/sec	1,200 mm/sec	1,200 mm/sec	500 mm/sec	500 mm/sec	500 mm/sec	500 mm/sec	500 mm/sec	600 mm/sec	600 mm/sec	600 mm/sec	600 mm/sec	600 mm/sec	500 mm/sec
<b>Bend</b>	260 deg/sec	260 deg/sec	260 deg/sec	260 deg/sec	260 deg/sec	132 deg/sec	132 deg/sec	180 deg/sec	180 deg/sec	140 deg/sec	70 deg/sec	70 deg/sec	50 deg/sec	25 deg/sec	10 deg/sec	8 deg/sec	6 deg/sec	260 deg/sec	180 deg/sec	90 deg/sec	
<b>Rotation</b>	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	90 deg/sec	90 deg/sec	90 deg/sec	100 deg/sec	40 deg/sec	360 deg/sec	360 deg/sec	360 deg/sec	
<b>Max Stacks at Max OD (Std)</b>	N/A	N/A	4	4	4	4	4	4	4	4	3	3	3	2	1	1	1	4	4	3	
<b>Max Bend Radius (Std)</b>	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	4D	3.7D	3.7D	4D	4D	4D	
<b>Max Bend Angle</b>	190°	190°	190°	190°	190°	190°	190°	190°	190°	190°	190°	200°	190°	190°	190°	190°	190°	190°	190°	190°	
<b>Load Height (Std)</b>	1,250 mm	1,250 mm	1,250 mm	1,250 mm	1,250 mm	1,250 mm	1,250 mm	1,250 mm	1,260 mm	1,200 mm	1,200 mm	1,200mm	1,300 mm	1,290 mm	1,275 mm	1,550 mm	1,665 mm	1,250 mm	1,300 mm	1,350 mm	
<b>Max Tube Length (Std)</b>	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,100 mm	3,200 mm	3,200 mm	6,000 mm	6,100 mm (20ft)	6,100 mm (20ft)	3,200 mm	3,200 mm	3,200 mm	
<b>Max Tube Length (Hitch) (Std)</b>	4,750mm	4,900 mm	4,600 mm	4,600 mm	4,750 mm	4,800 mm	4,800 mm	4,800 mm	5,000mm	4,700 mm	5,500 mm	5,700 mm	5,900 mm	5,300 mm	7,900 mm	9,100 mm	9,100 mm	4,400 mm	4,400 mm	5,100 mm	
<b>Multi Radius**</b>	N/A	N/A	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	N/A	N/A	Standard	Standard	Standard	
<b>Repeatability/Accuracy</b>	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°
<b>Length (Std)</b>	5,500 mm	5,530 mm	5,200 mm	5,200 mm	5,400 mm	5,390 mm	5,500 mm	5,500 mm	5,650 mm	7,065 mm	7,065 mm	7,065 mm	7,840 mm	8,100 mm	10,600 mm	11,600 mm	11,800 mm	5,700 mm	5,700 mm	6,800 mm	
<b>Width (Std)</b>	1,450 mm	1,550 mm	1,120 mm	1,120 mm	1,400 mm	1,400 mm	1,450 mm	1,450 mm	1,550 mm	2,360 mm	2,390 mm	2,390 mm	2,370 mm	2,910 mm	2,900 mm	3,860 mm	4,470 mm	2,342 mm	2,465 mm	3,950 mm	
<b>Weight (Std)</b>	2,900 kg	3,190 kg	2,650 kg	2,650 kg	2,880 kg	2,940 kg	2,500 kg	2,980 kg	3,500 kg	6,500 kg	8,180 kg	11,000 kg	13,500 kg	16,000 kg	20,000 kg	47,000 kg	55,000 kg	3,000 kg	4,760 kg	12,000 kg	

# Unison EvBend

Manually operated, CNC-controlled 3-axis tube bending machines

Yet another Unison innovation, our EvBend range offers CNC-controlled, manually operated 3-axis, mandrel, multi-plane bending at a fraction of the cost of fully automated CNC bending machines.

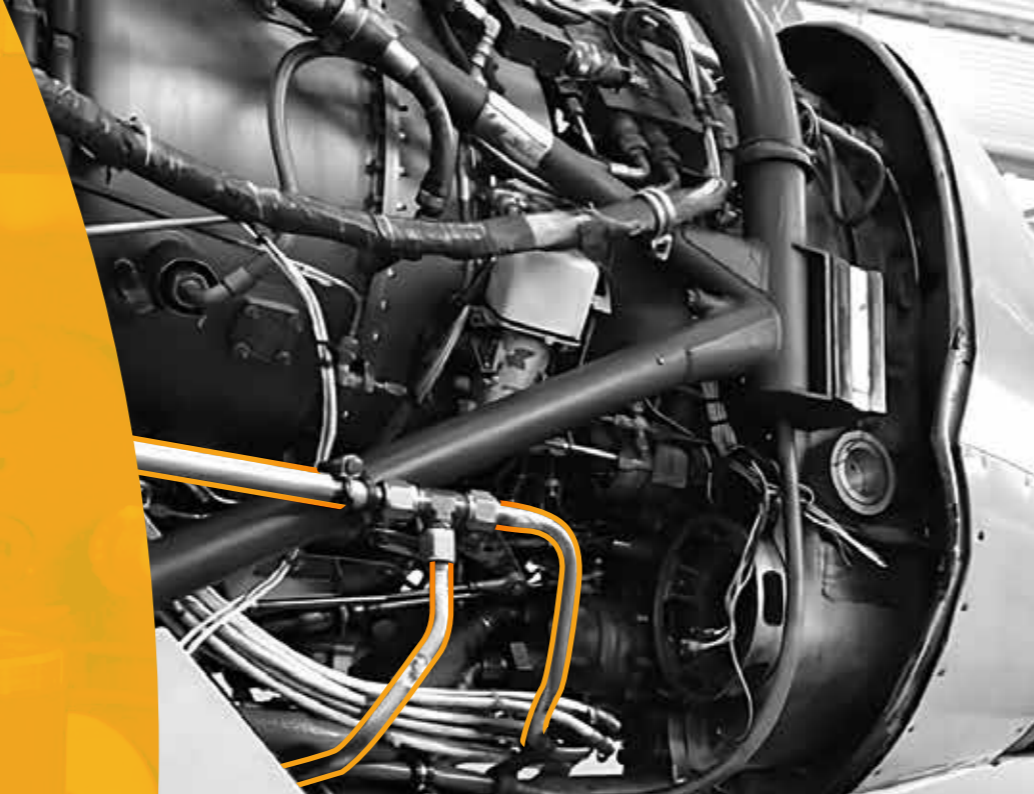
Designed for low volume, high-accuracy production and prototyping, EvBend machines are widely used across the aerospace, MRO, Formula 1, and oil & gas industries and provide precision bending of tube up to 50 mm in diameter. Axes are operated by hand, but CNC-controlled using encoders and progressive electromagnetic brakes.

The EvBend CNC control features a PC-based 15" touchscreen and is capable of processing up to 1000 bends per component, storing infinite parts and connecting to CAD and most tube measuring systems.

Size	EvBend 1000	EvBend 2000
<b>Bending Capacity*</b>	3 mm – 16 mm (22 mm in Copper)	3 mm – 50 mm
<b>Bend Radius (CLR)</b>	Up to 135 mm	Up to 200 mm
<b>Bend Programme Lines</b>	Unlimited	Unlimited
<b>Bend Settings</b>	100	100
<b>Max Tube Length Over Mandrel</b>	Customer specific	Customer specific
<b>Max Bend Arm Movement</b>	190°	190°
<b>Machine Accuracy</b>	+/- 0.1 mm & +/-0.1°	+/- 0.1 mm & +/-0.1°
<b>Screen</b>	LCD 15" touch screen	LCD 15" touch screen
<b>Length</b>	3,658 mm	3,982 mm
<b>Height at Carriage</b>	1,000 mm	1,000 mm
<b>Width at Bend Head</b>	840 mm	1,696 mm
<b>Weight</b>	365 kg	750 kg
<b>Electrical</b>	Single Phase 220 – 240V	3 Phase 380 – 415V



EvBend 2000



# Unison Breeze Twinhead

Symmetrical bending made simple

Our Unison Breeze 'Twinhead' all-electric tube benders have been developed for the high-speed manufacture of symmetrical tubular shapes, such as those typically found in automotive, agricultural and furniture applications. Examples include wheelbarrows, shopping trolleys and seat frames for buses and trains.

Choose from a 5-axis model with optional weld-seam detection, end forming, tube marking and barcode batch reading capability, or an 11-axis multi-stack, multi-radius model for more complex shapes, with a wider range of options that include flattening and punching units. Both versions can also operate as simple U-bend machines.

A 2-axis U-bender work cell is also available for the production of ladder rungs. Options include automatic loader, tube separator, tube centralizer/measurer, servo-electric 'pick and place' system and ejection chute.

Discover more:  
[www.unisonltd.com](http://www.unisonltd.com) [sales@unisonltd.com](mailto:sales@unisonltd.com)



Size	Twinhead (1.5")
<b>Bend Direction</b>	Right and Left
<b>Bending Capacity*</b>	38 x 1.5 mm
<b>Bend Torque</b>	1,750 mm
<b>Servo Controlled Follower</b>	N/A
<b>Collet Capacity</b>	38 mm
<b>Axis Speed (Max) Feed</b>	2000 mm/sec
<b>Bend</b>	180 deg/sec
<b>Rotation</b>	90 deg/sec
<b>Max Stacks at Max OD (Std)</b>	1 per head
<b>Max Bend Radius (Std)</b>	3D
<b>Max Bend Angle</b>	190°
<b>Load Height (Std)</b>	N/A
<b>Max Tube Length (Std)</b>	N/A
<b>Max Tube Length (Hitch) (Std)</b>	6,000 mm
<b>Multi Radius**</b>	N/A
<b>Repeatability/Accuracy</b>	Feed: 0.05/0.1 mm Bend: 0.05/0.1 Rotation: 0.05/0.1°
<b>Length (Std)</b>	6,500 mm
<b>Width (Std)</b>	1,600 mm
<b>Weight (Std)</b>	2,800 kg



# Unison Synergy

Hybrid, dual-stack  
tube bending machines



## An evolution, to create a revolution

If you aspire to Unison quality but carry out repetitive tube bending operations that don't typically require the rapid setup time and all-electric operation of a Unison Breeze machine, it's time to discover Unison Synergy.

Developed to make Unison quality and reliability accessible to even more companies involved in tube manipulation, Synergy machines combine precise electric control with our near-silent advanced hydraulic operation.

Available in 50 mm and 80 mm (maximum tube diameter) versions, Synergy models feature the latest Unibend Lite control system, and dual-stack capability. Offering considerable power and rigid mechanical design, they are available with a choice of industry-leading motors and drives.

Choosing Synergy means benefiting from exceptional levels of control, with functionality and user-friendly features closely matching those enjoyed by users of Unison Breeze machines.

Unison Synergy tube benders may be more accessibly priced than Breeze models, but that's not at the expense of quality. Plus they are backed by our legendary high levels of service and aftersales support.

## Unison Synergy Technical Specifications

Size	Synergy 50 mm	Synergy 80 mm
Bending Torque	5,000 Nm	25,000 Nm
Bending Capacity	50.8 x 2.55 mm	80 x 2 mm
Y Axis (DBB)	1000 mm/sec	1000 mm/sec
B Axis (POB)	200 deg/sec	200 deg/sec
C Axis (Bend)	90 deg/sec	45 deg/sec
Max Bend Radius	170 mm	280 mm
Max Bend Angle	180°	180°
Max Tube Length	4.0 m (6.0 m)	4.0 m (6.0 m)
Max Tube Length (Collet Cap of 38.1mm)	5.5 m (7.5 m)	5.5 m (7.5 m)
Repeatability/Accuracy	Feed: 0.1 mm Bend: 0.1° Rotation: 0.1°	Feed: 0.1 mm Bend: 0.1° Rotation: 0.1°
Length	6.5 m (8.5 m)	6.9 m (8.9 m)
Width	1.2 m	1.4 m
Load Height	1.1 m	1.3 m
Power Supply	380/400V for 50/60Hz	380/400V for 50/60Hz

Discover more:  
[www.unisonltd.com](http://www.unisonltd.com)  
[sales@unisonltd.com](mailto:sales@unisonltd.com)

## Unison Synergy At a glance

- Hybrid, dual-stack tube bending machines
- 50 mm or 80 mm collet capacity
- Exceptional power and rigid mechanical design
- User-friendly Unibend Lite touchscreen control system
- Choice of industry-leading motors and drives
- 3D component simulation and measuring machine interfaces
- Renowned Unison quality and reliability
- Designed for repetitive tube manipulation tasks
- Servo-driven bend arm, carriage, plane of bend, powered follower and carriage side shift
- Unison machine ownership - at a highly accessible price

## Gain the cutting edge

### Nukon fibre lasers from Nukon Lasers UK

Precision tube bending and fibre laser cutting go hand in hand. It's for that reason we've established Nukon Lasers UK as the official UK and Ireland distributor for Nukon's high quality and highly accessible European-made fibre laser cutting systems.

Just like Unison, Nukon are committed to building superb quality machines that exceed customer expectations. In the Nukon fibre laser range you'll find 2D, 3D and laser tube cutting machines, as well as loading and unloading solutions. High-spec standard features include: nLIGHT fibre lasers, Beckhoff controls and Lantek Expert software – one of the most advanced CAD/CAM nesting software packages on the market today.

### At a glance

- 2D, 3D and tube fibre laser cutting machines from Europe
- Accessible high power and high performance - up to 20kW
- American-made nLIGHT fibre lasers with optional adaptive beam optimisation
- Beckhoff controls and Lantek Expert CAD/CAM nesting software
- Single machines to fully automated work cells
- 5-axis machines for the most challenging of applications

# NUKON UK

Nukon's range of 2D fibre laser machines includes models designed for first-time laser users and businesses adding value to in-house manufactured products, as well as high-performance machines for demanding flat-bed laser metal cutting requirements in subcontract environments. Nukon's fibre laser tube cutting machines are renowned across a wide range of industries and include pipe and profile cutting models, and the exceptional Vento Flex – a top-spec machine equipped to cut tubes, pipes, profiles and flat metal sheet.

If all that isn't enough to tempt you, purchasing a fibre laser machine from Nukon Lasers UK also means receiving the same uncompromising standards of service and support that are enjoyed by owners of Unison tube bending machines.

- Pipe, profile and flat metal sheet cutting solutions
- Fully automated loading and unloading technologies
- Exceptional value and build quality
- Energy efficient - incredibly low running costs
- Machine tool training, service and support packages available

Discover more:

[www.nukonlasers.co.uk](http://www.nukonlasers.co.uk)  
[sales@nukonlasers.co.uk](mailto:sales@nukonlasers.co.uk)



## Wire and small-bore tube bending machines

For more than 50 years, Pneuform has been a leading name in the manufacture of wire forming and small-diameter tube bending machines. Pneuform was the first company to produce CNC programmable, 2-axis tube and wire bending machines - bringing them to market in the late 1970s.

Pneuform then went on to develop the world's first 3-axis wire bending machines in the 1980s and, since then, has stayed at the forefront of wire and small-diameter tube bending technologies.

Today, as a member of the Unison family, Pneuform continues to lead the way in the design and build of specialist wire and small-bore tube bending machines. Exciting new models are in the pipeline, supported by Unison's advanced user-friendly control systems and simulation software, and backed by its legendary service and support.

- **High-quality machines for most wire and small-bore tube bending applications**
- **Multi-axis solutions for highly complex bends**
- **User-friendly Unison control systems**
- **Yaskawa motors and drives**
- **Options for secondary operations, including heading machines and press stations**
- **Machine tool training, service and support packages available**



### 3D rotary head wire & tube bending machines

Pneuform's range of rotary head bending machines includes models capable of bending mild steel wire of 3 mm to 16 mm in diameter, and tube of up to 20 mm in diameter. Typical wire components produced include automotive head restraints, exhaust hangers, ISO fix wires, seat rails, retail and POS display parts and wire forms. Typical tube products include: tube brewery coolers and air-conditioning pipework.



### Twin head wire & tube bending machines

Pneuform twin head machines can bend wire of 3 mm to 6 mm in diameter, or tube of 3 mm to 10 mm in diameter. Using a special clamping mechanism, long, straight components are bent from the outer towards the centre, before being transferred to an output conveyor. Typical components produced include: bundy brake lines, car seat frames, lumbar supports and trim wires.



### Rotating wire 3D bending machines

Pneuform rotating wire 3D bending machines are capable of bending mild steel wire of 3 mm to 10 mm in diameter, and tube of up to 14 mm in diameter. A key feature is each machine's rise and fall table, which provides reliable part support and offers different manufacturing possibilities. Typical wire components produced include automotive head restraints, exhaust hangers, ISO fix wires, seat rails, retail and POS display parts. Typical tube products include: tube brewery coolers and air-conditioning pipework.



### Enamelled wire stripping & bending machines

Pneuform's immensely flexible 10-axis wire stripping and bending machines are designed for the precise, rapid production of many of the electrical components used in automotive manufacturing, bus bar wires and other electrical parts. The machines straighten the wire, strip the coating, bend, then cut as required to provide a complete solution. For greater freedom of bend angles, the machine face rotates around the wire, while a vacuuming feature clears away waste enamel.



### Copper & aluminium bus bar bending machines

Pneuform bus bar bending machines are designed specifically for producing bent and pierced strip components. These are primarily made from coated or uncoated aluminium and copper, ranging from 2 mm to 8 mm in thickness, and up to 45 mm in width. Parts produced are generally for electrical bus bars for distribution boxes, parts for use in electric vehicles, and battery bars.

## Unison precision tube and pipe bend tooling

*- precisely what good tooling should be*

*Our expert tooling team has the technical knowledge and experience to design and manufacture tooling for the most challenging of tube bending applications - regardless of whether that's precision bending the exotic alloys used in aerospace and MRO or manufacturing high-volume components for the automotive sector.*

*To support growing demand, in 2023 we invested a further £1 million in the machine shop at our state-of-the-art UK-based tooling manufacturing facility. At our locations in the UK and USA, we typically hold more than £100,000 worth of consumable tooling in stock - including mandrel balls and wiper dies, all ready for despatch.*

*Choosing Unison bend tooling means de-risking your processes, as we'll ensure that every tool fits perfectly and makes parts accurately, without marks, slips, scuffs or scrapes. We can also customise tool mounts, making it simple and straightforward to use new tooling with existing equipment. Our selection of materials and hardening processes ensures we focus on the right solution for your application.*

*With innovations such as quick-change collets and mandrels, and bar-coded tooling for automatic setup, we save you time and money, removing the risk of error during changeovers. Should the need arise, we can even provide a 24-hour, reinforced 3D printed carbon fibre tooling service for your prototypes.*



## Unison Consumable Tooling Agreements

*Unison Consumable Tooling Agreements allow our customers to take advantage of shorter lead times, reduced on-site stockholding levels and significant cost savings. Whatever your consumable bend tooling requirements or frequency, we'll create a tooling agreement that meets your needs perfectly - holding the wiper dies, mandrel balls and other stock you require at one of our UK, USA or partner facilities for scheduled and swift, on-demand delivery.*

### **The benefits of choosing Unison Consumable Tooling:**

- *Scheduled and on-demand consumable tooling delivery*
- *Much faster delivery times than made-to-order tools*
- *Eliminate the risk of a tooling shortage stopping production*
- *Standardise the tooling used across all your facilities*
- *Reduce the stockholding and value of tooling you keep on site*
- *Save money - volume discounts and convenient, regular payments*

### **To discuss your tooling requirements:**

**Contact:** Luke Gibson

**Tel:** +44 (0) 1723 582868

**Email:** [lukeg@unisonltd.com](mailto:lukeg@unisonltd.com)

# Innovation, automation and integration

## Machine tool automation solutions, to improve productivity, efficiency and quality

At Unison, we don't simply manufacture, sell and support world-class machine tools. Our automation division builds the complete solutions that help manufacturers improve productivity, efficiency and quality.

Working in highly regulated sectors, such as aerospace, automotive, food & beverage, nuclear, shipbuilding and oil & gas, the division streamlines production to enable leaner manufacturing.

Depending on customer requirement, this can mean creating fully automated work cells that include tube bending solutions from Unison Ltd, fibre laser cutting technologies from Nukon Lasers UK, or wire bending machinery from Pneufarm Machines Ltd.

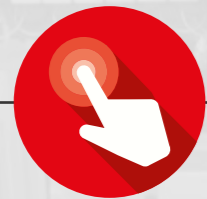
Capabilities include sophisticated jigs and fixtures, remote handling solutions, robotised cells with transfer systems, tooling verification with remote diagnostics, and automated flowlines.

Always looking to future-proof technologies and deliver cost-efficiency, our automation teams work closely with customers to integrate the very latest advancements into their solutions, helping improve efficiency, productivity, quality and error prediction.

From robotic cells to integrated production lines, customers receive cost savings and the best solutions to enjoy the highest level of automation.



**DESIGN**



**SIMULATION**



**MANUFACTURE**



**INTEGRATION**



**COMMISSIONING**



### Design

Our automation division has the design capabilities to scheme, simulate, assemble and inspect a vast range of solutions. Examples include fixtures of single-sided or matched mould tooling, lifting and handling rigs, robotic automation, manufacturing process flow lines, inspection and verification cells.

### Simulation

As soon as the most appropriate solution has been established, an initial agreement to model, simulate and animate the solution is entered into. This typically includes accessing the process for safety, collision detection and ergonomic issues, and to establish real-time process savings.

### Manufacture

With the simulation stage complete, our team will produce detailed tooling drawings and manage the complete manufacture and sourcing of all hardware and software. This is achieved using internal capacity, or through a network of trusted suppliers.

### Integration

Before integration takes place, Unison programmers and engineers will work to investigate, assess and solve any potential issues. This ensures all necessary procedures are completed efficiently at the commissioning stage.

### Commissioning

Commissioning is only carried out by experienced fitters, all of whom are compliant with worldwide health & safety regulations. This ensures full control and accountability is maintained. Projects have recently been completed in the UK, USA, Angola, Brazil, South Africa and the Czech Republic.

## Industry leading software, to put you in complete control

Ever since our business was first established, our aim has been to make bending even the most complex of tubular shapes straightforward and simple.

That's why we developed Unibend - a CNC that is widely considered to be the most user-friendly control system for tube and pipe manipulation. It's why we offer Opt2Sim Suite, our own tube simulation software. And why we created Opt2Sim Scan - our own, advanced 3D tube scanning measurement system. We also offer a free-to-download tube bending application app to help simplify even the most complex of tube bending challenges.

Working closely with our customers, we are proud to provide some of the most cutting-edge tube manipulation software solutions on the market today.

### Unibend control

Launched in the early 1990s, our user-friendly Unibend control system has been widely recognised as the industry leading tool for precise tube and pipe manipulation. The CNC is continually updated to help ensure our customers benefit from the maximum efficiency, simplicity and productivity in their tube and pipe bending operations. The latest version of Unibend offers users of our all-electric tube bending machines performance enhancements in the region of 25% compared to previous tube manipulation cycle times.



### Unison tube bending application app

Free to use, our web-based and mobile-friendly tube bending application app makes it simple and straightforward for operators to establish the required tooling type, mandrel style, size and material, bend torque and machine size for any tube bending application. While the ability to store your own directory structure for customer files makes later recall on PC or phone easy.

As an additional benefit, a clear, simple indication of 'application difficulty' - the difficulty of bending virtually any metal, wall thickness and diameter - is also provided. Where customers are looking to bend new components or start new projects, but do not have the correct tooling or machinery, the app provides a valuable feasibility/viability check, detailing essential data regarding the equipment they will need to use.

Register to use the app at <https://app.unisonltd.com>



### Opt2Sim Suite - tube simulation software

Developed for 'Design to Manufacture' production strategies, our Opt2Sim tube bending simulation software suite uses machine and component data to provide a precise, virtual insight into the tube bending process - before a single trial part is bent. Available in the following versions - or with the option to create your ideal tube bending software package - Opt2Sim's competitive annual licensing fees make it a highly attractive option.

#### Opt2Sim Step

Drag and drop STEP files into the software application and extract tube bending data instantly. Or draw parts by entering XYZ coordinates or YBC data and view them in 3D. Quickly convert bending data into printable PDF reports.

#### Opt2Sim Tube

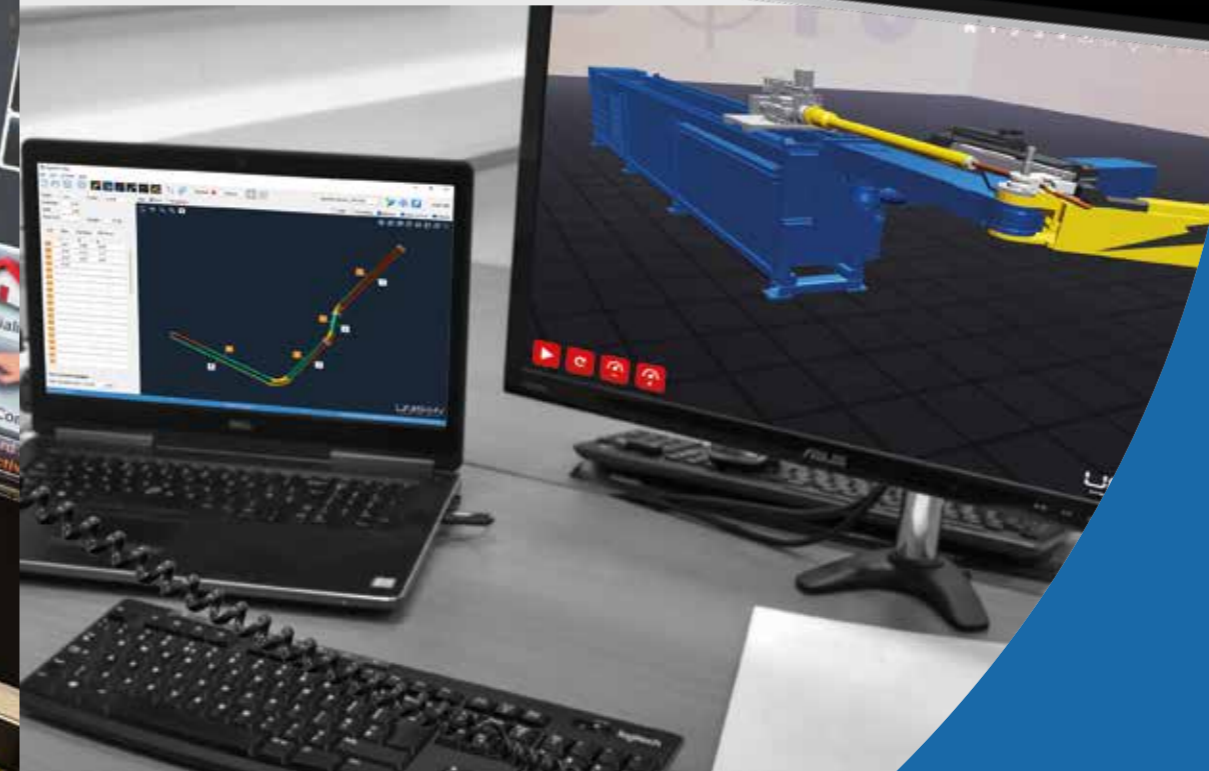
Simulate parts accurately in real time on a CAD-based virtual model of your bending machine, with collision detection and fully automatic smart collision resolution that will find a manufacturing solution for even the most complex tube geometry.

#### Opt2Sim + WPS

Add our Work Processing System to the simulator, allowing multiple users to batch-process parts on multiple bending machines at once.

#### Opt2Sim Scan

Rapidly process 3D scans of bent parts to extract tube geometry. Compare and align scans to master data with a single click, and export tube corrections to a PDF report or direct to the bending machine in Supervision format.





## Precise, portable 3D tube scanning - made quick and easy

Possibly the most advanced hand-held tube measurement system on the market, Opt2Sim Scan combines rapid scanning of tube geometry with easy extraction of tube data.

Simply use the portable scanner to measure the tube or component you wish to replicate or measure. Extract its bending data in Opt2Sim Scan. Then easily compare measured tube dimensions to master file data and send corrections directly to the bending machine.

Offering considerable scan points without compromising speed, the constant reference geometry ensures supremely accurate results - without the need for a skilled operator to always place the part in the same position or enter some of the information pre-scan.

With Opt2Sim Scan sitting within our own suite of software, 'compare to master' and feedback to the bending machine is quick and seamless, without pausing the bending process.

As the scanner is fully autonomous, it is easily combined with a cobot or robot to make it part of a manufacturing cell for 100% inspection.

Add our simulation package to replicate the entire bending process on a CAD-based model of your Unison Breeze or Unison Synergy machine - for a precise, virtual insight into the tube bending process before a single physical part is bent.

- **Rapid 3D scanning of tubular parts and components**
- **Automatic detection of tube diameter and bend radius**
- **Quick, easy generation of PDF bending reports**
- **Export Supervision correction files in a click**
- **'Compare to master' and intuitive correction functions**
- **Seamless integration with Opt2Sim Suite and Unibend CNC software**
- **Easy to use interface with minimal user training**

Scan

Extract

Simulate



## Superior service and support for Unison, Nukon and Pneufarm machines

At Unison, we've always believed in providing the highest levels of service and support. In fact, outstanding service is in our DNA. From getting to know your manufacturing requirements intimately, so we can recommend the best Unison, Nukon or Pneufarm machine for the job, to completing hassle-free commissioning, delivering first-class operator training and even assisting with product development, we go the extra mile.

And it's a commitment that doesn't end after installation. No matter where you're located, you'll find we're never more than a phone call away - and in the unlikely event you experience a machine problem, our streamlined procedures will ensure a rapid response.

Our team includes experts in all tube bending, wire bending and fibre laser cutting applications, as well as Unison, Pneufarm and Nukon-trained software, electrical and mechanical specialists. Many customers also take advantage of our online support service, allowing an engineer to access their machines remotely and make any necessary alterations. It's a quick and easy way to have an expert working alongside you in real-time to resolve issues and ensure interruptions to production are dealt with swiftly.

- All machines supplied with a 12-month warranty
- Optional five-year extended warranty for additional peace of mind
- Online ticketing system with guaranteed next day response
- Online machine support to resolve production issues
- Annual service contracts and ad-hoc service and repairs
- UK and US-based Unison-trained service personnel
- PPM programmes tailored to individual customer needs
- Discounted OEM spare parts with service-level agreements
- Machine inspection and condition reports
- Control system upgrades and process optimisation
- Servo drive axis and full upgrades



## Ancillary solutions to shape your success

To help you produce the precise parts you need, we offer a wide choice of ancillary technologies - each built to the same high standards as our tube and pipe bending machines.

Choose from high-quality end-forming machines, beading machines, thread-rolling machines, coiling and de-coiling machines, coning and threading machines, special industrial washing machines, and fully automatic rising saws.

See the CT-38 in action:



## High-performance coning and thread-rolling

Discover the future of coning and threading with our new CT-38, ultra-precise tube and pipe end coning & thread-rolling machine. Developed with a particular focus on the gas-tight seals required across the growing hydrogen energy sector, the CT-38 is also set to simplify coning and threading in the oil & gas, hydraulics, lubricants, liquid processing and chemical industries.

The CT-38 will cone and thread medium pressure (up to 20,000 psi), high pressure (up to 60,000 psi) and ultra-high pressure (up to 150,000 psi) connections in stainless steel and exotic alloys, such as thick-wall super duplex pipes. The maximum tube diameter the machine will accept is 38 mm (1 1/2 inches).

Machine setup time is rapid, and the coning/threading cycle typically takes around five minutes to complete, including tool changes, for a one-off component. As the quality of the coning surface is critical to ensure a successful seal, the CT-38 machine completes an 'overturn' clean-up process following thread rolling and before precision coning occurs. Thread rolling produces a stronger thread than thread cutting and also generates zero swarf.

Able to cone and create both left-hand and right-hand threads in tube and pipe of as little as 6 mm in diameter (1/4-inch) up to that maximum diameter of 38 mm (1 1/2 inches), the CT-38 is largely constructed of aluminium and stainless steel to withstand operation in harsh, often corrosive environments. Our easy-to-use 15-inch touchscreen control provides intuitive programming and infinite recipe storage, while tooling changes are simple and straightforward.

- 20,000 psi, 60,000 psi and 150,000 psi connections
- 1/4", 3/8", 9/16", 1" and 1 1/2" diameters
- Left- and right-hand threads
- For stainless steel and super duplex tubes
- Easy to use 15" touchscreen
- Infinite recipe storage with easy access



## Tube end-forming and beading machines

Individually built to specific customer needs, Unison CNC-controlled tube end-forming and beading machines are fully programmable and used in sectors such as aerospace and oil & gas. Capabilities range from 6 mm (1/4") to 152 mm (6"). Options include:

### Segmented forming

- Drop-in tooling ensures fast, easy setup and minimal downtime
- Standard barrel assemblies and interchangeable finger and jaw tooling for maximum flexibility
- Short cycle times for enhanced efficiency and productivity

### Ram forming

- Enhanced part containment for increased diametrical accuracy and concentricity
- Sharper radii and transitions in fewer operations than by using air forming
- Save time and money

### Spin/roll forming

- Delivers smooth, mark-free surfaces
- Fully repeatable process with excellent concentricity between parent tube and form
- Quality results with minimal material fatigue

## Beading machines

Unison beading machines add strength and rigidity to the end of tubing, also allowing for hose attachments. Our most popular end-forming machines, they are suitable for use with stainless steel, aluminium and copper tubing, as well as with a variety of exotic alloys. Typical applications include HVAC, automotive exhaust pipes, fuel and brake lines.



## Coiling machines

Tailored to each customer's individual requirements, Unison all-electric CNC tube coiling machines are fully programmable in speed, profile and pitch. They produce the precise helical and pancake coils used by industries that require heat exchangers.

Unison pancake coils are typically found in HVAC and refrigeration, as well as in automotive applications, including ignition systems.

Other applications include medical devices, aerospace applications, power conversion and even sealing the containers used in food production. Unison helical coils are found in heat exchangers, refrigeration and advanced flow systems.

- **Precise coiling of tube of up to 30 mm in diameter**
- **Powerful maximum bend torque of 5,500 Nm**
- **Bends at 90 degrees a second**
- **Quick tooling change**
- **Clockwise/anti-clockwise and forward/reverse bend direction**
- **Scissor lift feature for lowering/positioning heavy drums**
- **Easy to use HMI touchscreen**
- **Storage of bend data programs for easy recall and repeat order setup**
- **'Tube in tube' plus other options**



## Fully automatic rising saws

Unison fully automatic rising saws feature a proven design for the most demanding of tube cutting applications. Standard features include hydraulic clamp, variable blade speed and dynamic cutting feed.

## Special industrial tube washing and drying machines

Providing reliable daily operation around the globe, our tube washing and drying machines are used to ensure a spotless tube finish. Fitting seamlessly into automation systems, they can be found across a number of industries - particularly oil & gas. Choose from standard and inline conveyor solutions.

## Flat bar formers

Unison flat bar forming machines are a favoured choice in stairlift railing production as well as other applications that require precise manipulation of flat bar materials, such as freeform and sculptured projects.

- **Seamless production of flat bar, toothed rack and pocketed flat bar**
- **Team with Opt2Sim Suite tube simulation software for 'Design to Manufacture' production**

# A world of expertise



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Whilst every care has been taken in the production of this brochure, we cannot be held responsible for any errors. As we are committed to continuous improvement, machine specifications are subject to change.

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