TATA STEEL

TATA

Steel solutions for the greenhouses of tomorrow

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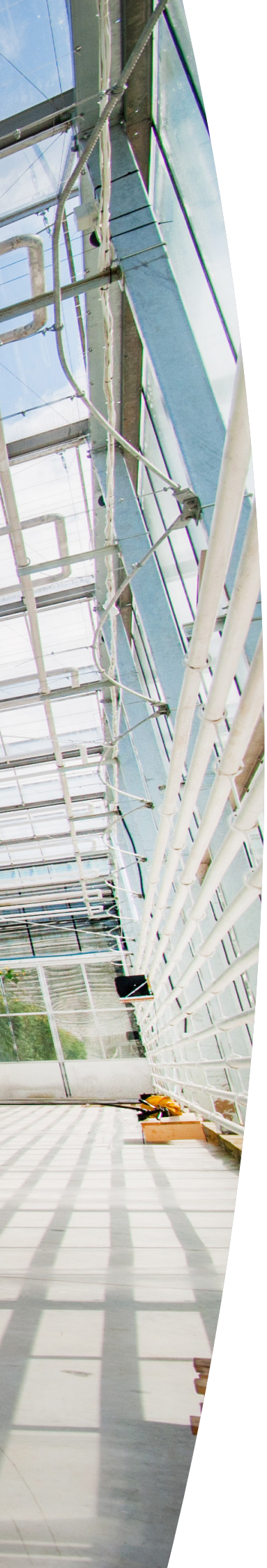

Steel solutions for the greenhouses of tomorrow

Tata Steel Nederland has been a trusted partner to the agriculture and horticulture sector for decades. With strong material expertise and a clear understanding of industry challenges, we support growers, greenhouse builders and investors in creating future-proof, efficient and sustainable greenhouse solutions. From cultivation systems to structural elements and technical installations, our smart steel applications help solve complex challenges.

The horticulture industry is entering a new era. Rising energy costs, labour shortages and growing sustainability demands call for innovative, accessible solutions. Tata Steel provides not only high-quality products, but also the knowledge and experience to guide well-informed decisions.

Our steel solutions are designed to deliver long-term value – enhancing efficiency, extending the lifespan of installations, and enabling greenhouses to meet the standards of tomorrow.

- **Sustainable**: durable, corrosion-resistant coatings, designed for closed-loop recycling
- **Reliable**: consistent quality, dependable supply and dedicated technical support
- **Collaborative**: we work alongside you from concept to construction

Curious how we can support your next-generation greenhouse project? Discover our full product portfolio and explore the possibilities.

"Together with growers, builders and investors, we combine steel solutions and expertise to create greenhouses that are efficient, sustainable and future-ready."
– Tata Steel Nederland

Performance through partnership

At Tata Steel we see every customer relationship as a true partnership. Our technical experts collaborate closely with you, sharing knowledge and practical insight to help select the right products and to support the development of solutions that meet evolving market needs. Working side by side, we create innovations that deliver proven performance, advance sustainability goals and provide lasting value for the greenhouse sector.

Designed for demanding greenhouse environments

Advantica Horti Control® is a pre-finished steel solution designed for the greenhouse environments. With a Z225 galvanised substrate and a robust 150 µm protective film, the topcoat delivers superior corrosion resistance, durability, and up to 10 years' proven performance. The hygienic, residue-free surface withstands rigorous cleaning protocols and chemical agents, ensuring safe food production. A reliable choice for growers and equipment manufacturers seeking long-term value and lower total cost of ownership.

Forcas® is our range of special galvanised and coated precision steel tubes manufactured to EN 10305-3. Developed specifically for greenhouse heating systems, it combines maximum light reflection, outstanding corrosion protection and precise heat control, creating the perfect growing climate. Its lightweight, easy-to-maintain design features an integrated coupling in the tube, allowing for quick and easy installation using a pressing tool. It also ensures fast cleaning and guarantees long-lasting performance, boosting crop quality, increasing yields and reducing operating costs.

Contiflo® is our range of special galvanised precision tubes manufactured to EN 10305-3. Our unique production process creates an exceptionally strong bond between steel and zinc, delivering corrosion protection that outperforms other galvanised tubes. Its premium passivation coating and dry, clean, oil-free surface ensure a smooth, uniform finish for facilitated processing. By heating the tubes after welding and before zinc plating, we achieve an improved microstructure, superior bendability, and outstanding weld seam strength.

Forcon® Greenhouse is our range of premium cold formed welded structural hollow sections to EN 10219, tailored to the specific requirements of the different applications in greenhouses. The circular tubes are mainly used for radiant heating systems, from distribution tubes in the boiler room to monorail heating and tube rail systems. The square or rectangular structural hollow sections are frequently used due to their strength, versatility and closed cross section. These tubes are essential components in the fabrication of columns, posts, trusses, beams, and braces - delivering reliable performance in all critical load-bearing and support elements.

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Advantica Horti Control®

Laminated pre-finished steel for robust, bright and durable horticultural gutters and internal walls

Application

Advantica Horti Control® is specifically tailored for high performance horticulture: the very robust topcoat and improved backing coat provide a high level of light reflectance, which promotes plant growth. Its cleanability ensures a long service life and the resistance of the topcoat to various chemicals, including H_2O_2 vapour, helps create a hygienic environment. Advantica Horti Control® is compatible with biological horticulture.

Characteristics

- Very robust topcoat
- Excellent hygienic properties
- Very high level of light reflection both top- and back side
- Topcoat is resistant to many cleaning agents, even to H_2O_2
- Compatible with biological horticulture
- Long service life
- Z225 Hot-dip Galvanised substrate to EN 10346
- The product has a low carbon footprint, optionally available with Lower Carbon Embodied Prepainted Steel and Zeremis® (mass-balanced)
- A third party verified EPD is available
- Fully REACH compliant
- A fit for purpose guarantee is available for up to 10 years

Continuous improvement

With continuous investment in research and development Tata Steel constantly update the product portfolio to ensure that they can meet the requirements of the manufactured goods sector.

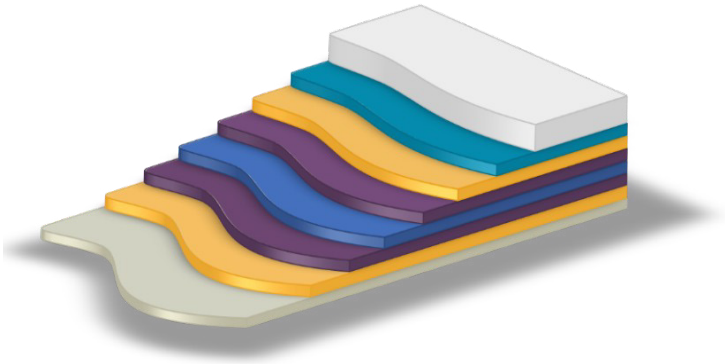
Myriaplus®

Tailored solutions and services

For any customised requirements, Tata Steel can meet your needs with shorter lead times, flexible quantities and further processing. Our technical support team is on hand to help you to define:

- To tailor products to customer needs for the application requested
- The best solution in view of the application and the manufacturing process
- The precautions to be taken regarding the end use of this product

Product structure



Key

PVC film (150µ)	Adhesive (8µ)	Surface treatment
Metallic coating	Steel substrate	Backing coat

EPD THIRD PARTY VERIFIED ISO 14025 & EN 15804

REACH COMPLIANCE

Responsible Steel standards & certification

Product testing

To ensure the integrity of the Advantica® products, Tata Steel uses laboratory tests to measure their performance against corrosion, effect of sunlight, chemicals and abrasion. All testing of products is carried out in specialised laboratories to international standards.

Forming and processing

Depending on specification and steel grade the Advantica® products can be formed and processed with various techniques including: cutting, notching, piercing, slitting, press braking, roll forming, spinning and deep drawing.

Cleaning and maintenance

The robust topcoat film is optimised for intense cleaning at standard ambient temperatures, including H_2O_2 (5%) based deep cleaning. The use of abrasive cleaners or scouring pads is not recommended.
H_2O_2 cleaning is compatible with biological horticulture conform EU 2017/409.
After cleaning, always thoroughly rinse the exposed sides of Advantica Horti Control® with clean water. This prevents localised high concentrations of aggressive cleaning agents.

Guarantee period

A fit for purpose guarantee is available for up to 10 years. The actual duration of the guarantee will depend on the geographic location and application.

For further information, please visit

www.tatasteelnederland.com/products
E: connect.colors@tatasteeleurope.com

Typical properties

Advantica Horti Control®		**Test norm**
Nominal organic coating thickness	150 µm	EN 13523 - 1
Gloss level (60°)	10%	EN 13523 - 2
Nom. light reflectivity top	86.5%	BS 8493
Nom. light reflectivity reverse	76%	BS 8493
Flexibility:		
Minimal bending radius	0T@16°C	EN 13523 - 7
Minimal adhesion	0T	EN 13523 - 7
Pencil hardness	4H	EN 13523 - 4
Scratch resistance (g)	4000	EN 13523 - 12
Corrosion resistance:		
Salt spray test	500 h	EN 13523 - 8
Condensation test	1500 h	EN 13523 - 26
UV resistance	Ruv1	EN 10169
CPI category	CPI5	EN 10169
Max continuous operating temperature	60°C	EN 13501 - 1
Food safety	Pass	EN 1186
		EN 13130

Notes
- The figures are typical properties of the topcoat and do not constitute a specification. For details on test methods see www.tatasteelnederland.com/products
- If forming pre-finished steel below 16°C please consult Tata Steel for further information
- To meet the corrosion resistance properties, a Zinc weight of Z225 gr/m² applies
- Not suitable for outdoor use

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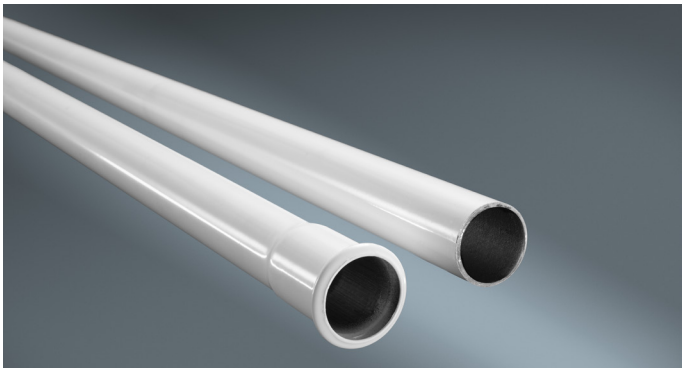
Forcas®

The crop heating pipe solution

Forcas® is our range of special galvanised and coated precision steel tubes manufactured to EN 10305-3. Developed specifically for greenhouse heating systems, Forcas® combines maximum light reflection, outstanding corrosion protection, and fast, trouble-free installation. Its proven performance, low-maintenance design and durability have made it a trusted choice for horticulture worldwide.



Why choose Forcas® ?

Forcas® is a special galvanised and coated thin-walled steel precision tube ideally suited for greenhouse heating systems. Combining maximum light reflection, outstanding corrosion protection and precise heat control, it creates the perfect growing climate. Its lightweight, easy-to-maintain design ensures quick installation and cleaning and guarantees long-lasting performance, boosting crop quality, increasing yields and reducing operating costs.

Long-lasting corrosion protection

Externally thermally galvanised and finished with a white elastic powder coating for exceptional durability in demanding greenhouse conditions.

Maximum light reflection

The bright white powder-coated surface enhances light distribution throughout the greenhouse, improving crop growth and uniformity.

Quick and easy to install

Lightweight construction, integrated connectors, a wide range of accessories and the connection with an electrical pressing unit make installation faster, simpler and more cost-effective – with no welding or painting required.

Low-maintenance and hygienic

Double protection and a smooth, hygienic surface reduce cleaning time and upkeep, ensuring optimal light and a clean growing environment season after season.

Optimised for plant growth

Adjustable tube height positions heat close to crop tips, lowering humidity, reducing disease risk and enabling the heating system to 'grow' with the plants.

Energy-efficient heat control

Small-diameter tubes operate with minimal water volume for precise heat regulation, saving energy and reducing heating costs.

Applications

It's no surprise that Forcas® is becoming a fixture in virtually every area of greenhouse cultivation. The best known is the hoisting heating system. With this height-adjustable system, tubes are positioned near the growing tips of plants such as tomatoes and paprikas. This effectively lowers humidity and reduces the risk of diseases. The heating system is able to 'grow' with the plants, ensuring optimal conditions throughout the season. This not only improves crop quality, but also increases yield per square metre while reducing heating costs.

The versatile Forcas® system is also used in combination with tables on which various types of pot plants are grown. Here the system can be used in two ways: as a fixed or as a height-adjustable heating system.

Forcas® can be installed as a main heating fixed system at the top of the greenhouse or under the growing tables. This system is increasingly being used in garden centres.

In addition, Forcas® excels in combination with modern 'gutter' cultivation systems for crops such as strawberries, tomatoes, and gerberas. Its benefits in these setups - consistent temperature control, improved plant health and energy saving - are immediately apparent.

From hoisting heating systems to fixed installations, whether installed as an overhead system, integrated under growing tables or combined with gutter systems, Forcas® is an innovative, proven solution for a wide range of greenhouse applications, maintaining ideal conditions from seeding to harvest.

TECHNICAL SPECIFICATIONS

- Forcas® is an externally special galvanised precision tube that is coated continuously on our lines for precise coating control and then given an additional white flexible powder coating.
- Forcas is available with an integrated connector for quick fixing.
- Forcas® tubes are manufactured in accordance with EN 10305-3.
- Steel qualities in accordance with EN 10130.
- Outside diameters 28mm, 35mm with wall thickness 1.2mm and 42mm with wall thickness 1.5mm.
- Standard length 7 metres.
- Packaging: each bundle is film-wrapped in plastic polyethylene.

Main specifications

	Unit	Forcas® 28	Forcas® 35	Forcas® 42
Diameter	mm	28	35	42
Wall thickness	mm	1.2	1.2	1.5
Weight - without water	kg/m	0.80	1.01	1.51
Weight - with water	kg/m	1.31	1.84	2.69
Water content	litre/m	0.51	0.83	1.18
Surface	m2/m	0.088	0.110	0.132

Support

The table below shows the theoretical maximum sag in the middle of a tube filled with water. The sag is shown for varying support intervals as a result of the tube's own weight.

The deflection is calculated for the worst case scenario using a single-span beam with hinged support. In practice, continuous tube multi-span beams with intermediate support points are usually used. Therefore, the maximum sag shown below will not be achieved in reality.

Maximum sag

Support interval in metres	Unit	Forcas® 28	Forcas® 35	Forcas® 42
3.00	mm	7.35	5.13	3.49
3.50	mm	13.62	9.50	6.47
4.00	mm	23.24	16.21	11.04
4.25	mm	29.62	20.66	14.06
4.50	mm	37.23	25.97	17.68

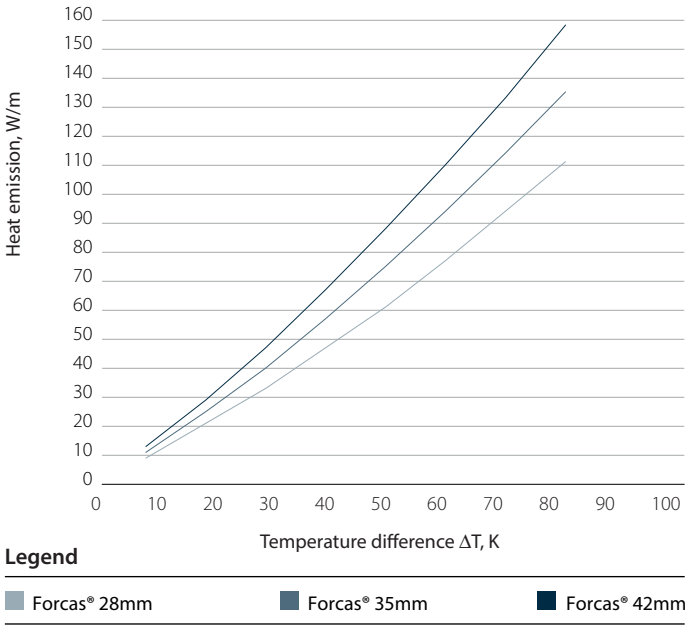
Heat emission

The heat emission of the tubes, expressed in Watts per metre, determines the amount of energy that can be transmitted to the surroundings (graph 1). The heat emission is dependent on the following factors:

1. **Location of the tubes** - The location of the tubes in relation to the crop affects the air circulation around the tube. If the tube is contained within a more or less closed crop, up to 15 % less heat will be emitted than if the tube is fully exposed. The location of the tubes does not affect the portion of heat emission transmitted by means of radiation.

2. **Temperature difference** - This is the temperature difference between the greenhouse air and the average tube temperature (i.e. the average of supply and return temperature per heating spiral).

Graph 1 Heat emission



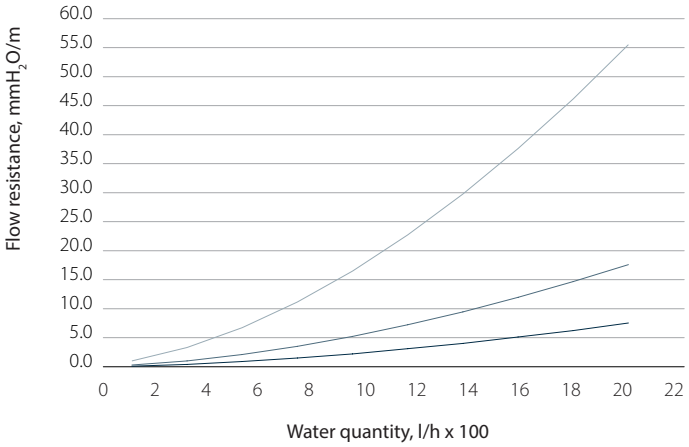
Legend

Forcas® 28mm | Forcas® 35mm | Forcas® 42mm

Flow resistance

The flow resistance of heating tubes (expressed in water column millimetres per metre), which determines the head of the pump to be installed, depends for the internal tube diameter in question primarily on the volume of water flowing through the tube (expressed in litres per hour). Graph 2 shows the flow resistance according to the volume of water flowing through the tube. Different values apply for bends, valves, etc.

Graph 2 Flow resistance



Legend

Forcas® 28mm | Forcas® 35mm | Forcas® 42mm

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Contiflo®

The premium galvanised precision tubes

Contiflo® is our range of special galvanised precision tubes manufactured to EN 10305-3. Its superior surface quality, reliable corrosion resistance and weld seam strength have made it a trusted choice for various applications, such as closed heating systems for buildings and greenhouse aerating, industrial packaging, gardening tools and automotive components.

Why choose Contiflo®

Contiflo® stands out thanks to a unique production process that creates an exceptionally strong bond between steel and zinc, delivering corrosion protection that outperforms other galvanised tubes. Its premium passivation coating and dry, clean, oil-free surface ensure a smooth, uniform finish for facilitated processing, optimal performance and aesthetic appeal. By heating the tubes after welding and before zinc plating, we achieve an improved microstructure, superior bendability, and outstanding weld seam strength.

Internal protection

The inside of our Contiflo® tubes receive a dried synthetic emulsion treatment as standard. The option of an internal zinc coating is available upon request.

In line galvanising

Contiflo® tubes are galvanised on the outside using our in line coating process, which gives the tube a shiny finish and also hides the weld. The zinc layer is available in various thickness ranges.

Robustness

Our galvanising process ensures an exceptionally robust and strong bond. This allows the tube to undergo deformation without the risk of disbondment.

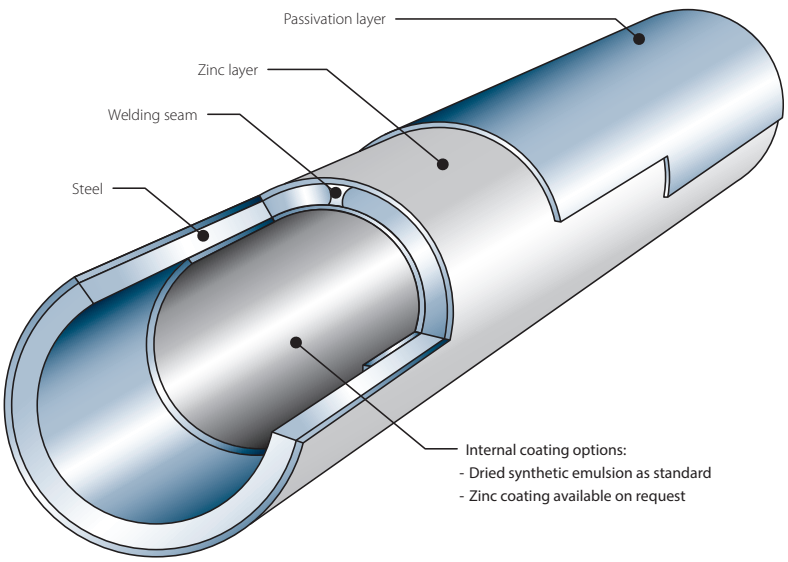
Delivery options

For confirmation of size range, coating options and key technical delivery conditions, please contact us to discuss your requirements in full. We are always willing to discuss customer specific requirements.

External surface quality

The surface of our Contiflo® tubes is of a high quality and is clean, dry and grease and oil free. The galvanised surface is passivated, which also provides an excellent protection against unsightly white rust.

Tube construction



DELIVERY OPTIONS

Technical delivery condition
Precision tubes are supplied to EN10305 - 3.

Steel quality
Steel in accordance with EN10111 and EN10130.

Size range capability
Please refer to the next pages.

Profiles
The standard profiles are circular, square and rectangular, but other cross sections are also possible.

Zinc thickness ranges
- 7 – 12 µm as standard,
- 8 - 15 µm for HVAC
- 12 - 25 µm semi heavy duty
- >25 µm heavy duty

External protection
- The tube is protected against ferrous rust by a zinc layer.
- Durable protection of the zinc layer from white rust is provided by a passivating coating.

Internal protection
Depending on the product type ordered, internal protection will be provided via a dried synthetic emulsion treatment or with the possibility of an internal zinc coating on request.

Corner radius (on profiles)
- 1.50 – 1.75 x wall thickness.

Bendability
- 2 – 2.5 x external diameter.

Lengths
- Standard from 4 – 10 m (-0/+50 mm on length tolerances as standard).
- Optional fix lengths and sizes <4 m

Bundles
- Circular tubes supplied in hexagonal bundles or rectangular U-brackets square and rectangular tubes in rectangular bundles.
- Customer-specific packing is possible.

Finishing options
On request: cutting, marking, caps etc.

Other customised variants
Different qualities, dimensions and cross sections may be available upon request.

Additional technical support
For additional confirmation of size range and technical delivery conditions, we have a team of technical experts available to help.

Please contact us to discuss your requirements in full.

SIZE RANGE

Contiflo®

Circular

	gauge range T (mm)						
OD (mm)	0.80 - 1.00	>1.00 - 1.20	>1.20 - 1.50	>1.50 - 2.00	>2.00 - 2.50	>2.50 - 3.00	>3.00 - 3.50
10.00	■	■	■	▪			
12.00	■	■	■	▪			
12.70	■	■	■	▪			
13.00	■	■	■	▪			
14.00	■	■	■	■	■		
15.00	■	■	■	■	■		
16.00	■	■	■	■	■		
18.00	■	■	■	■	■		
19.00	■	■	■	■	■		
20.00	■	■	■	■	■		
22.00	■	■	■	■	■		
25.00	■	■	■	■	■		
25.40	■	■	■	■	■		
26.00	■	■	■	■	■		
26.70	▪	■	■	■	■	■	▪
26.90	▪	■	■	■	■	■	▪
27.00	▪	■	■	■	■	■	▪
27.85	▪	■	■	■	■	■	▪
27.90	▪	■	■	■	■	■	▪
28.00	▪	■	■	■	■	■	▪
30.00	▪	■	■	■	■	■	▪
31.70	▪	■	■	■	■	■	▪
32.00	▪	■	■	■	■	■	▪
33.50	▪	■	■	■	■	■	▪
33.70	▪	■	■	■	■	■	▪
34.85	▪	■	■	■	■	■	▪
35.00	▪	■	■	■	■	■	▪
38.00		■	■	■	■	■	▪
42.00		■	■	■	■	■	▪
42.40		■	■	■	■	■	▪
45.00			▪	■	■	■	▪
50.00			▪	■	■	■	▪
54.00			▪	■	■	■	▪
60.00			▪	■	■	■	▪
66.70			▪	■	■	■	▪
76.10			▪	■	■	■	▪

■ Availlable subject to minimum order quantities.

▪ Dependant on additional parameters, feasibility study required.

Additional custom dimensions are available upon request.

Please contact us to discuss your specific size requirements.

Contiflo®

Square and rectangular

		gauge range T (mm)					
H (mm)	B (mm)	0.80 - 1.00	>1.00 - 1.20	>1.20 - 1.50	>1.50 - 2.00	>2.00 - 3.00	>3.00 - 3.50
10.00	10.00						
12.00	12.00						
15.00	15.00						
16.00	16.00						
18.00	18.00						
19.00	19.00						
20.00	10.00						
20.00	15.00						
20.00	20.00						
25.00	15.00						
25.00	20.00						
25.00	25.00						
29.00	20.00						
30.00	10.00						
30.00	20.00						
30.00	25.00						
30.00	30.00						
33.00	20.00						
38.00	20.00						
40.00	20.00						

Availlable subject to minimum order quantities.

Dependant on additional parameters, feasibility study required.

Additional custom dimensions are available upon request.

Please contact us to discuss your specific size requirements.

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Forcon® Greenhouse

Horticulture tubes according to EN 10219

In cooperation with the horticulture sector, we have developed tailored tubes for the use in greenhouses.

Produced with precision and expertise, our Forcon® Greenhouse offer a myriad of benefits for your needs: Dimensional consistency, excellent weldability and suitability for galvanizing, superior surface quality and batch traceability.

Ensuring quality in every piece, the reliable performance of our cold formed welded steel greenhouse horticulture tubes allows you to process with confidence in automated robot production. They are usually supplied in accordance with EN10219, in either S235JRH or S275J0H. However, we can also provide other steel grades such as S355J2H or S500MH. The utilisation of higher strength steel grades can, for example, have a beneficial effect on the durability and longevity of rail systems.

Tolerances

Dimensional tolerances are to EN 10219.

Surface

To save costs for surface treatment during further processing, Forcon® Greenhouse are supplied without preservative oil.

Galvanising suitability

The steel composition complies with category A according to ISO 14713-2:2020, perfectly suitable for hot dip zinc coating.

CE Marking

Forcon® Greenhouse are manufactured and CE marked according to EN 10219.

Weldability

The welding suitability of Forcon® Greenhouse is excellent due to their low CEV. The conditions for welding cold-formed zones and adjacent material described in EN 1993 / Eurocode 3 are fulfilled for the listed steel grades (e.g. S355J2H).

Weld seam

The weld seam position is on the wide side of rectangular profiles. Customer-specific positions, such as in the middle or outside the middle of the side, on the small side of the hollow section or a scarfed internal weld bead are possible for various dimensions (subject to minimum order quantities).

Technical Support

We want you to get the best from our tubes and pipes. Our sales team is always happy to answer your questions on steel selection or available options. And our engineers are available to assist you with the application of our Forcon® Greenhouse tubes for an efficient and sustainable design.

Inspection & Testing

Depending on the steel grade, Forcon® Greenhouse are subject to non-specific or specific inspection and testing and are supplied with an inspection certificate type 2.2 or 3.1 to EN 10204.

Availability

Forcon® Greenhouse are available across the size range indicated in the below tables. Minimum order quantities may apply and other sizes or thicknesses may be available – please contact your Tata Steel Nederland Tubes representative for details.

Standard lengths are 6m, 9m, 10m, 12m or 15m, depending on the size and production mill. Special mill lengths from 4.5m up to 20m can be arranged upon request.

Sustainability

Steel is strong, durable, versatile, re-usable and most importantly, it is endlessly 100% recyclable without loss of quality. We take sustainability very seriously and as well as being a member of Responsible Steel™, we have BES 6001 certification and Environmental Product Declarations (EPD's) for our Forcon® Greenhouse tubes. To reduce carbon emissions, you can choose from different Zeremis® solutions.

SIZE RANGE

We have tailored the properties of our Forcon® Greenhouse tubes to the specific requirements of the different applications in greenhouses:

Circular tubes are mainly used for radiant heating systems, from distribution tubes in the boiler room to monorail heating and tube rail systems. Manufactured from untreated black steel, each tube undergoes rigorous tightness testing to ensure long-lasting durability, even in the challenging environments. The result: consistent, high-quality performance you can rely on. The available dimensions shown in the enclosed table are matched to suit this specific application, ensuring optimal fit and performance throughout the system.

Forcon® Greenhouse

Circular hollow sections (CHS) according to EN 10219, extra tested to ensure tightness

mm	2.0	2.25	2.5	2.6	2.75	2.9	3.0	3.2	4.0
31.8	■			□				□	
38.0	■	■		□				□	□
44.5	■	■		□				□	□
51.0	■	■	■	■				□	□
57.0	□	■	□	□				□	□
60.3	□	■	□	□				□	□
63.5	□	■	□	□				□	□
70.0	□	■	■	□				□	□
76.1	□	■	■	□		■		□	□
82.5	□		■	□		□		□	□
88.9	□		■	□		■		□	□
101.6					■			□	□
108.0					■			□	□
114.3					■			□	□
121.0							□	□	□
127.0							□	□	□
133.0							■		□
139.7							□		□
152.4							□		□
159.0							□		□
168.3								■	□
193.7									□
219.1									□
273.0									□

□ These dimensions are available on request (depending on steel grade and minimum order quantity)

■ Specific dimensions for the use in greenhouses.

For information on other available sizes, please refer to our specific Forcon® datasheets for each steel grade.

In greenhouse construction, square or rectangular structural hollow section steel tubes are frequently used due to their strength, versatility and closed cross section. These tubes are essential components in the fabrication of columns, posts, trusses, beams, and braces - delivering reliable performance in all critical load-bearing and support elements. A variety of steel grades are available to meet different requirements, ensuring optimal solutions that align with the design specifications of modern structures. The dimensions tailored to this application in greenhouse construction are shown in the enclosed table.

Forcon® Greenhouse

Square hollow sections (SHS) and rectangular hollow sections (RHS) according to EN 10219

mm	2.0	3.0	4.0	5.0
25/25				
40/40				
50/25				
50/30				
50/50				
60/30				
60/40				
70/40				
80/40				
80/50				
80/60				
100/50				
120/50				
120/60				
140/60				
140/80				
160/60				
160/80				
160/160				
200/80				
200/100				

These dimensions are available on request (depending on steel grade and minimum order quantity)

Specific dimensions for the use in greenhouses.

For information on other available sizes, please refer to our specific Forcon® datasheets for each steel grade.

www.tatasteelnederland.com/greenhouse

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Tata Steel Nederland B.V. is registered in the Netherlands under number 34005278 with registered office at Wenckebachstraat 1, 1951 JZ Velsen-Noord.

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