

## Hybox® TT

### Tight tolerances for efficient manufacturing

Hybox TT meets your needs for accuracy and performance. To compete in the marketplace, we know you need consistent hollow sections that you can rely on for efficient processing, product performance and brand reinforcement. That's why we developed Hybox TT.

For optimised efficiency in equipment manufacturing, it is essential that tube size and shape are consistently accurate. Hybox TT meets that demand – with reliably tight tolerances every time.










Hybox® TT is a cold-formed structural welded hollow section with consistently tight tolerances – making it ideal for automated production processes. With an excellent surface finish, Hybox TT can help improve manufacturing efficiency, output and end product quality.

We manufacture Hybox TT to external dimensional tolerances that are twice as stringent as those defined in European standard EN 10219. Combined with improved corner radius, concavity/convexity, clean-cut ends and an excellent surface finish, this delivers multiple benefits for equipment manufacturers. With a minimum yield strength of 275 up to 700 MPa, Hybox TT is suitable for many applications including agricultural machinery, trailers and cranes.



#### Hybox TT enables you to:

- reduce rejection rate and rework
- speed up manufacturing for increased output
- save time and money on surface preparation
- reduce the weight of end products
- improve product performance
- enhance your brand through great looking products

#### Summary of tolerances - Squares & Rectangles

Description tolerance	EN10219	Hybox TT
 <b>Size</b>	B<100mm: Min ±0.5mm; ±1% B≤200mm: ±0.8% B>200mm: ±0.6%	B<100mm: Min ±0.25mm; ±0.5% B≤200mm: ±0.4% B>200mm: ±0.3%
 <b>Thickness</b>	T≤5mm: ±10% T>10mm: ±0.5mm	T≤5mm: ±10% T>10mm: ±0.5mm
 <b>Concavity/Convexity</b>	Min 0.5mm; Max 0.8% of side	Min 0.25mm; Max 0.4% of side
 <b>Squareness</b>	90°±1°	90°±0.5°
 <b>Corner radius</b>	T≤6mm; 1.6T ≤ r <sub>ext</sub> ≤ 2.4T T≤10mm; 2T ≤ r <sub>ext</sub> ≤ 3T 10mm<T; 2.4T ≤ r <sub>ext</sub> ≤ 3.6T	T≤6mm; 1.8T ≤ r <sub>ext</sub> ≤ 2.2T T≤10mm; 2.25T ≤ r <sub>ext</sub> ≤ 2.75T 10mm<T; 2.7T ≤ r <sub>ext</sub> ≤ 3.3T
 <b>Straightness</b>	Max 0.15% of total length & max 3mm/m	Max 0.15% of total length & max 3mm/m
 <b>Twist</b>	2mm + max 0.5mm/m	2mm + max 0.5mm/m

#### Summary of tolerances - Rounds

Description tolerance	EN10219	Hybox TT
 <b>Size</b>	Min ±0.5mm ±1% Max ±10mm	Min ±0.25mm ±0.5% Max ±5mm
 <b>Thickness</b>	D≤406.4mm T≤5mm: ±10%; T>5mm: ±0.5mm D>406.4mm: ± 10%; max ±2mm	D≤406.4mm T≤5mm: ±10%; T>5mm: ±0.5mm D>406.4mm: ± 10%; max ±2mm
 <b>Out of roundness</b>	D/T≤100; Max 2% D/T>100; to be agreed	D/T≤100; Max 1% D/T>100; to be agreed
 <b>Straightness</b>	Max 0.2% of total length & max 3mm/m	Max 0.2% of total length & max 3mm/m

### Repeatable, efficient processing

To deliver Hybox TT's consistently tight tolerances, we exercise stringent control over all aspects of section production. Careful coil selection and slitting ensure a uniform cross-section. Investment in more accurate sizing and shaping rolls has ensured tighter concavity/convexity, more precise corner radii and improved external dimensions.

In addition to tight tolerances, Hybox TT offers high levels of formability and, because the steel is fully killed, excellent weldability. It can be welded, laser cut, drilled and fitted to a high quality standard in an automated production process. Hybox TT sections also have clean ends, free of burrs. This all adds up to faster, more efficient processing and increased output.

#### With Hybox TT you can:

- reduce your rejection rate and rework
- form and weld sections with ease and save on welding consumables
- save time in tube sorting and machine setting
- reduce the safety risk to staff during tube handling
- eliminate the need for re-cutting prior to processing

### Excellent surface finish

We know that a high quality tube surface matters to you. It cuts out the need for surface preparation prior to painting. It can also play an important part in reinforcing your brand – enabling a great visual appearance to finished products.

With Hybox TT sections, we take steps to ensure an excellent surface finish with minimised indentations and scratches. We select only the best feedstock for tube manufacture. In conjunction with optimised process settings, we have also invested in roll cleaning to ensure a smooth tube surface ready for painting.

#### With Hybox TT you can:

- eliminate shot blasting – saving time and money
- achieve a consistent painted surface without bumps, marks and scratches
- enhance your brand with products that look good

### Improved product performance

Using thermo-mechanically rolled fine grain steel feedstock, we have extended the Hybox TT range up to 700 MPa. High yield strength steel delivers the same mechanical properties at thinner gauges when compared to lower strength steel. This provides scope for end product improvements – enabling users to increase productivity and improve operational efficiency.

With Hybox TT you can reduce the weight of manufactured equipment to increase its payload and you can widen a machine's working area without weight penalties. For example; switching from 355 to 500 MPa achieves typical weight savings of 15-20%.

#### With Hybox TT you can:

- meet a wide range of demanding applications
- produce lighter equipment
- meet market demand for improved operational performance



### Hybox TT product range

<b>Steel grades:</b>	Range from S275 J2H up to S700 MH
<b>Shape dimensions (mm):</b>	
- circular:	From 33.7 x 2 up to 323.9 x 10
- rectangular:	From 30 x 20 x 2 up to 300 x 200 x 10
- square:	From 25 x 25 x 2 up to 250 x 250 x 10

Please check with your usual contact at Tata Steel Tubes for availability per grade and size. Full details of mechanical properties and size range availability for each grade are available in grade-specific datasheets available to download from our website [here](#).

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