











- > Electric resistance welded pipe and tube made of steel, comprising circular and non-circular hollow sections.
- > The goods are normally referred to as either CHS (circular hollow sections) or RHS (rectangular or square hollow sections).
- > The goods are collectively referred to as HSS (hollow structural sections).
- > Circular Product
 - > Exceeding 21mm outside diameter
 - > Up to an including 165.1mm
- > Rectangular, square and oval products
 - > Up to and including a 1277.3 mm perimeter
 - Finish types for the goods include pre-galvanised, hot-dipped galvanised (HDG), and non-galvanised HSS.

\checkmark The goods





× Not 'the goods'











Raw Material Handling

1.0 – 1.5 metre wide rolls of steel coil are processed to make welded steel tube. Each coil weighs anywhere from 18 to 27 tonnes. After careful inspection and measurement to ensure the material is correct, the coils are placed in a storage area.

The coil ends are prepared for the start of the milling process by uncoiling and levelling. The edges are trimmed and the flat steel is then slit into the required widths to suit different products.

They are then recoiled and the trimmed edges plus offcuts are collected for recycling as scrap metal.

Pre-mill Preparation

A fully computerised production log schedule selects which coils will be processed through the mill. At this stage, information on the coils and mults (i.e. slit sub-multiples of the coil) is entered into a computer system so that the end product can be traced for quality control purposes.





MIII Entry

Selected mults are taken from storage to meet production demands. Lengths are joined by a combination guillotine/ welding process. This does not halt production because a looper (or accumulator) allows a loop of steel strip to feed the mill while the joining operation takes place.

Cold Forming and Welding

A long series of forming rolls forms the flat steel into tube. The steel is not heated and this gradual cold forming process enhances the strength of the steel and allows for very tight dimensional tolerances. When the edges of the tube are pushed together by squeeze rolls, they are welded using Electric Resistance Welding (ERW).

The external weld flash is removed by special scarfing tools and the pipe is cooled uniformly in a cooling trough.





Eddy Current Testing

Weld quality is absolutely vital to the quality of the end products, its integrity is checked continuously (by our eddy current testing system) and any tube that does not conform is marked and rejected.

Sizing and Shaping

The tube then enters the sizing and shaping mill where rolls turn it into products such as square and rectangular hollow sections or other Australian Tube Mills' products such as StockRail.

Painstaking measurement takes place throughout the process to make sure the product conforms with specifications.

Protective Painting

These sections are then cleaned and degreased before entering the in-line painting process.

When required, this patented in-line Primer painting process took over 20 years to fully develop and offers excellent protection for steel products during transport, handling and fabrication. The various colours also make for easy identification of the products.





Cut-off and Bundling

After paint finishing, the product passes through an electronically controlled cut-off machine. Cut to specified lengths, the products then change direction and go through a run-out process en route to the bundler.

After a rigorous visual and dimensional inspection, most lengths of product go to the next step, those that have been ear-marked for rejection pass to one side. Tube products are then end faced to remove any jagged edges left by the cut off machine.

The bundler is a very complex process that sorts the product into pre-specified packs, wraps them with steel strap for transport and then removes them to the warehouse area.

The ends of the products are colour coded to identify wall thickness. Barcoded identification tags are also attached at this point.

Despatch

After weighing, they are put in the warehouse or are taken away for other operations, such as galvanizing. Packs are lifted onto semi-trailer transporters for despatch to our distribution network throughout Australia, New Zealand, the Pacific Rim and South-East Asia.





Verification Challenge:

Relevant, Complete and Accurate Cost Allocation



Cost elements include:

- Hot Rolled Coil
- Energy (electricity and gas)
- Labour wages
- Mill consumables (coolant, ferrite, paint, ERW copper work coils)
- Maintenance items (tooling machining / replacement, bearings, housings, ERW welder components)
- Strapping for bundling, export packaging







Mill Cost Model - Steel Tubing - 2016

Conversion costs for a typical welded tube plant

Item \$/unit	Factor	Unit	Unit Cost*	Fixed	Variable	Total
Hot rolled coil	1.045	tonne	325	0.00	339.63	339.63
HRC transport	1.045	tonne	5	0.00	5.23	5.23
Manpower	1.4	hours	25	8.75	26.25	35.00
Electricity	0.12	MWh	70	0.00	8.40	8.40
Welding consumables	1		2.50	0.00	2.50	2.50
Other consumables	1		7.50	0.00	7.50	7.50
Yield loss	4.5%	tonne	58.63	0.00	2.64	2.64
Scrap credit	4.5%	tonne	185	0.00	-6.66	-6.66
Depreciation & other			10	10.00	0.00	10.00
Packaging			2.50	0.00	2.50	2.50
SG&A costs			5	5.00	0.00	5.00
Total				23.75	387.98	411.73

Note: scrap from yield loss is different to downgrade or factory seconds

* All unit costs US Dollars. The steel product for which costs are shown is a metric tonne of welded tube 50mm x 50mm square with a gauge of 2.5mm and made from commercial quality steel [e.g. grade S235] as produced by an averaged size non-integrated tubemaker who purchases hot rolled strip on the open market.

Tube and Pipe Cost Modelling Notes and Assumptions

The Steel Costing Model

The economic model shown above indicates how tube costs can be estimated through a simple cost benchmarking approach. The predicted full cost is not meant to represent an actual cost for any real steel company. It is a notional figure only - albeit one that is built on fairly representative current input cost (e.g. **electricity prices**) and resource usage information.

http://www.steelonthenet.com/cost-welded-pipe.html



Raw materials form approximately 80% of the Cost to Make







Verification Challenge:

Accurate Model Matching

Information required for determining appropriate Models for matching

- 1: Determine if the product prime or downgrade (seconds)
- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification
- 4: Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa, greater than 450 Mpa)

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- 5: Determine the shape of product CHS, RHS or Oval
- 6: Determine the size of the product
- 7: Determine the thickness of the product

Model Matching Process

Information required for determining appropriate Models for matching

1: Determine if the product prime or downgrade (seconds)

- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification
- 4:Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa, greater than 450 Mpa)

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- 5: Determine the shape of product CHS, RHS or Oval
- 6: Determine the size of the product
- 7: Determine the thickness of the product
- "Downgrade" or Factory Seconds is product that does not meet specification and can cannot be sold as compliant "Prime" product.
- Sold at a discounted price generally into the domestic market
- <u>Must be excluded</u> from model matching of domestic Sales as not equivalent to export product
- Accounts for between 5% (world class) and 10% (typical) of production in HSS production
- Would not expect to see export sales of downgrade or factory seconds

Model Matching Process

Information required for determining appropriate Models for matching

- 1: Determine if the product prime or downgrade (seconds)
- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification
- 4:Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa, greater than 450 Mpa)
- 5: Determine the shape of product CHS, RHS or Oval
- 6: Determine the size of the product
- 7: Determine the thickness of the product
- Model matching must include comparing products of equivalent coating or finish.
- Pre-galvanized coil is approx AU\$150 premium over uncoated
- Painted product unlikely to be sold domestically so adjustment required to compare with export sales



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Product Coating or Finish

Black = Painted N.O.P = no coating

PROD_DESC	SHAPE	SIZE1	SIZE2	GAUGE	LENGTH	THICKNOM	GRADE	STANDARD	EINISH
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
40X 40X1.6 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Black
50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	ĊHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
30X 30X1.6 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
50X 25X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2	8	2	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
25X 25X3.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	3	6.5	3	C350	AS/NZS 1163-C350L0	Black
35X 35X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
50X 50X2.5 DURAGALPLUS 6.1 M AS/NZS 1163-C350L0	Square	50	50	2.5	6.1	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
40X 40X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	3	8	3	C350	AS/NZS 1163-C350L0	Black
40X 40X2.5 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Black
25X 25X2.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Black
30X 30X2.0 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	2	8	2	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X1.6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
75X 50X 2.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	2	8	2	450+	AS/NZS 1163-C450L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0	CHS	48.3	0	2.9	6.5	2.9	C350	AS/NZS 1163-C350L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	N.O.P. (No Oil or Paint)
35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	3	8	3	C350	AS/NZS 1163-C350L0	Black
35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2	8	2	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0	Square	25	25	1.6	7.3	1.6	C350	AS/NZS 1163-C350L0	Black
25X 25X2.5 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2.5	6.5	2.5	C350	AS/NZS 1163-C350L0	Black
100X 50X2.3 C450PLUS DURAGAL 8.0 M AS/NZS1163-C450L0	RHS	100	50	2.3	8	2.3	450+	AS/NZS1163-C450L0	In Line Galvanised
100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	100	50	5	8	5	450+	AS/NZS 1163-C450L0	Black
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	125	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0	Square	100	100	3	8	3	450+	AS/NZS1163-C450L0	Pre Galvanised
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	33.7	0	4	6.5	4	C250	AS/NZS 1163-C250L0	Black
90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	101.6	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0	RHS	250	150	6	12	6	450+	AS/NZS 1163-C450L0	Black
32NB MED PTD RED SOE 6.5 M AS 1074+AS/NZS 1163-C250L(CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	Black
25X 25X2.0 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Pre Galvanised

Model Matching Process

Information required for determining appropriate Models for matching

- 1: Determine if the product prime or downgrade (seconds)
- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification
 - 4:Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa, greater than 450 Mpa)

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- 5: Determine the shape of product CHS, RHS or Oval
- 6: Determine the size of the product
- 7: Determine the thickness of the product
- Next step is to compare product sold domestically to an International Standard to that exported to an Australian standard
- Claimed standard in exporters data can be verified by viewing Mill Test certificates
- Look for product that is sold as not meeting a standard or to internal specification sometime call "Commercial Grade". This product is generally not comparable to export product.



HSS is primarily manufactured to the following Australian Standards

- AS/NZS 1163 Cold-formed structural steel hollow sections (SHS, RHS and CHS)
- AS 1450 Steel tubes for mechanical purposes (Oval)
- AS 1074 Steel tubes and tubulars for ordinary service (CHS)



- Grades in AS/NZS 1163 Structural Steel Hollow Sections
 - e.g. Grade C350L0





Product Standard in Supplied Data

PROD_DESC	SHAPE	SIZE1	SIZE2	GAUGE	LENGTH	THICKNOM	GRADE	STANDARD	FINISH
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
40X 40X1.6 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Black
50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
30X 30X1.6 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
50X 25X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2	8	2	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
25X 25X3.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	3	6.5	3	C350	AS/NZS 1163-C350L0	Black
35X 35X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
50X 50X2.5 DURAGALPLUS 6.1 M AS/NZS 1163-C350L0	Square	50	50	2.5	6.1	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
40X 40X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	3	8	3	C350	AS/NZS 1163-C350L0	Black
40X 40X2.5 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Black
25X 25X2.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Black
30X 30X2.0 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	2	8	2	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X1.6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
75X 50X 2.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	2	8	2	450+	AS/NZS 1163-C450L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0	CHS	48.3	0	2.9	6.5	2.9	C350	AS/NZS 1163-C350L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	N.O.P. (No Oil or Paint)
35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	3	8	3	C350	AS/NZS 1163-C350L0	Black
35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2	8	2	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0	Square	25	25	1.6	7.3	1.6	C350	AS/NZS 1163-C350L0	Black
25X 25X2.5 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2.5	6.5	2.5	C350	AS/NZS 1163-C350L0	Black
100X 50X2.3 C450PLUS DURAGAL 8.0 M AS/NZS1163-C450L0	RHS	100	50	2.3	8	2.3	450+	AS/NZS1163-C450L0	In Line Galvanised
100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	100	50	5	8	5	450+	AS/NZS 1163-C450L0	Black
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	125	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0	Square	100	100	3	8	3	450+	AS/NZS1163-C450L0	Pre Galvanised
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	33.7	0	4	6.5	4	C250	AS/NZS 1163-C250L0	Black
90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	101.6	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0	RHS	250	150	6	12	6	450+	AS/NZS 1163-C450L0	Black
32NB MED PTD RED SOE 6.5 M AS 1074+AS/NZS 1163-C250L	CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	Black
25X 25X2.0 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Pre Galvanised



Verification by Mill Test Certificate

Confidential Mill Test Certificate Example										

Model Matching Process

Information required for determining appropriate Models for matching

- 1: Determine if the product prime or downgrade (seconds)
- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification
- 4:Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa,

greater than 450 Mpa)

- 5: Determine the shape of product CHS, RHS or Oval
- 6: Determine the size of the product
- 7: Determine the thickness of the product
- Grade is a measure of the ability of the member to withstand applied loads
- The higher the Grade of the product the greater load that can be applied before failure
- Higher grade products can undergo greater bending, twisting, compression and tension forces before failure
- Model matching requires comparison of equivalent Grades
- If no equivalent grade an adjustment is required



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- Grades in AS/NZS 1163 Structural Steel Hollow Sections
 - e.g. Grade C350L0





Available Product Grades and suitable HRC Grades

Product	Product Grade	Suitable HRC Coil Grades
AS/NZS1163 CHS/Pipe products only	C250L0	JIS SPHT2, AS HA250, ASTM SS33
AS/NZS1163 CHS, RHS, SHS	C350L0	JIS SPHT3, AS HA300, ASTM SS40
AS/NZS1163 RHS, SHS	C450L0	JIS SPHT4, AS HA350, ASTM SS50
AS1450 Ovals	C350	JIS SPHT3, AS HA300, ASTM SS40
AS1074 Pipe products only	Not Specified min 195MPa	JIS SPHT2, AS HA250, ASTM SS33

* Note: rule of thumb there is a 20% strength increase from Coil to finished product



The strength grade of HSS is an import attribute for model matching as <u>higher strength</u> grade material will have a <u>higher sell price in the market</u>. This is because the <u>cost</u> of Hot Rolled Coil feed material <u>increases</u> due to the higher strength coil required to produce higher strength HSS. The strength increase in coil is achieved through the addition of <u>expensive alloying elements</u> which increases the manufacturing cost of the Hot Rolled Coil.

<u>Australian and European</u> design standards allow for <u>higher strength HSS product</u> which is reflected in the higher grade HSS used in these regions. <u>American, Japanese</u> and other design standards tend to have lower strength grades.

It is anticipated that domestic sales of HSS in <u>Chinese</u>, Korea, Taiwan and Malaysia will predominantly be to <u>lower strength or grade</u> than that exported to Australia.

It should be noted that the higher strength grade in these countries may attract an addition premium over and above the Hot Rolled Coil cost difference as the product will generally be used in more critical design situations.

In undertaking a constructed cost it is critical that the correct Hot Rolled Coil grade is costed to reflect the grade of material for which the cost is being constructed.

Grade Comparison Why is it important?

Confidential Grade Extra's Price List



The increased cost of different strength grades is typically presented as an extra to a base coil price.



Common international Pipe and Tube Standards

Comparison list of Standards that compare with AS/NZS 1163.									
Country	Standard Number	Title	Year	Status					
Australia	AS/NZS 1163:2016	Cold-formed structural steel hollow sections	2016	Current					
Japan	JIS G 3466:2015	Carbon steel square and rectangular tubes for general structure	2015	Current					
	JIS G 3445:2016	Carbon steel tubes for machine structural purposes	2016	Current					
USA	ASTM A500 / A500M-13	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and	2013	Current					
		Shapes							
	ASTM A1085/A1085M-15	Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS	2015	Current					
European Union	EN 10219-1:2006	Cold formed welded structural hollow sections of non-alloy and fine grain steels	2006	Current					
Korea	KSD D 3566:2014	Carbon steel tubes for general structural purposes "pipes"	2014	Current					
	KSD D 3568:2009	Carbon steel Square for general structural purposes "square tubes"	2009	Current					
Taiwan	CNS7141	Carbon steel square and rectangular tubes for general structure	6/10/2014	Current					
	CNS15727	Carbon steel tubes for building structure	6/10/2014	Current					
China	GB/T 6728-2002	Cold formed steel hollow sections for general structure – Dimensions, shapes, weight and permissible deviations	2002	Current					
	GB/T 6725-2008	Cold forming steel sections	2008	Current					
Malaysia	MS 1862:2005	Carbon steel tubes for machine structural purposes - specification	2005	Current					

Note: that designation of a strength grade may not reflect the minimum yield strength of the material. American (ASTM) and Japanese (JIS) standards name the grade designation in terms of the minimum tensile strength.



Common international Pipe and Tube Standards and Grades

HSS: CON	S: COMPARISON OF MASS TOLERANCE AND GRADE BETWEEN VARIOUS NATIONAL PRODUCT STANDARD									ANDARDS	5												
HSS Droduct		Thickness	GRADE - Standard, Grade Designation, Min.Yield Stress																				
Standard	Mass Tolerance	Tolerance	JIS G 3444	ASTM A500	JIS G 3444	EN 10219	JIS G 3466	AS/NZS 1163	ASTM A500	EN 10219	ASTM A500	JIS G 3444	ASTM A500	ASTM A500	JIS G 3466	ASTM A500	AS/NZS 1163	EN 10219	JIS G 3444	JIS G 3444	EN 10219	AS/NZS 1163	EN 10219
	Tolerance	STK290	Grade A (CHS)	STK400	\$235	STKR400	C250	Grade A (RHS)	S275	Grade B (CHS)	STK490	Grade B (RHS)	Grade C (CHS)	STKR490	Grade C (RHS)	C350	\$355	STK500	STK540	\$420	C450	S460	
AS/NZS 1163	-4%	+/- 10%						250									350					450	
ASTM A500	None	+/- 10%		230					270		290		315	315		345							
JIS 3444	+/- 10% (Note 1)	+/- 10%	Note (5)		235							315							353	390			
JIS 3466	+/- 10% (Note 1)	+/- 10% (Note 3)					245								325								
EN 10219	-6%	+/- 10% (Note 4)				235				275								353			420		460
Notes:																							
AS/NZS 1163	AS/NZS 1163:2009 Cold-formed structural steel hollow sections																						
ASTM A500 -	2010 Standard Sp	ecification for Co	ld-Formed	Welded and S	eamless Ca	rbon Steel S	tructural Tu	bing in Rou	nds and Shap	es													
JIS G 3444:20	006 Carbon steel t	ubes for general s	tructural p	urposes (CHS	only)																		
JIS G 3466:19	998 Carbon Steel S	quare Pipes for G	eneral Stru	ctural Purpos	ses																		
EN 10219:20	06 Cold formed w	elded structural h	ollow secti	ons of non-al	loy and fine	e grain steel	s .																
(1) For the ve	rsion of JIS sighte	d, there is no men	tion of Ma	ss Tolerance.	However, th	ne IPSOS rep	ort notes +/·	10%.															
(2) +/-10% fo	r 4.0-8.0 mm thick	<, +/- 0.3 mm for 2	.0-3.2 mm t	hick																			
(3) For wall t	hickness under 3.	0 mm, tolerance is	s +/-0.3 mm			.							6.1.0										
(4) For CHS v	/ith OD <= 406. 4m	im and all RHS: to	r thickness	(t) <= 5 mm ti	nen +/-10%	for t > 5 mm	then +/-0.5	mm. For all	other CHS, t to	plerance is	+/-10% with a	a maximum	of +/- 2 mm.										
(5) Min. Yield	stress not nomin	lated in the Standa	ard.																				
	Casan Santian an	ann an bla ann dao	- AC /NI7C1	162 0250																			
	Vallow Section co	mparable grades	to AS/NZS1	162 - 0250																			
	Orange Section of	omparable grades	to AS/NZS1	163 - 0450																			
	orange section c	.omparable grade	10 M3/NZ51	103-0450																			

This table compares the minimum yield strength requirement of each of the Strength Grade designation in the commonly used National Standards.

Model Matching Process

Information required for determining appropriate Models for matching

- 1: Determine if the product prime or downgrade (seconds)
- 2: Determine the Coating
- 3: Determine the manufacturing/material Standard or specification

4:Determine the grade of the product Grade (≤ 175Mpa, 250Mpa, 350Mpa, 450 Mpa, greater th<u>an 450 Mpa)</u>

Austube M

5: Determine the shape of product CHS, RHS or Oval

6: Determine the size of the product

7: Determine the thickness of the product

- Model matching should look at products of equivalent shape and similar size or thickness
- Groupings of product should be the same across exports and not be used to manipulate dumping margin outcomes.



Shape, Size and Thickness

TXX 60X 3 0 C40PLUS BLUE 8.0 M ASNZS 1163-C450L0 SHIS 75 60 3 8 3 450+ ASNZS 1163-C450L0 Black 50M BMED CLIP E 6.5 M AS 1074-ASNZS 1163-C250L0 CHS 60.3 0 3.6 6.5 3.6 C250 ASNZS 1163-C250L0 PE chamised 50X 25X 2 BLUE RHS 6.0 3.0 3.6 6.5 3.6 C250 ASNZS 1133-C250L0 PE chamised 50X 25X 2 BLUE RHS 6.5 M ASNZS 1163-C250L0 Square 25 2.5 1.6 6.5 3.6 C250 ASNZS 1133-C250L0 Black 50X 50X 2 BLUE RHS 6.5 M ASNZS 1163-C250L0 Square 25 2.5 1.6 6.5 3.6 C250 ASNZS 1133-C250L0 Black 50X 50X 2 DUBLACE/PLUS 8.1 M ASNZS 1163-C250L0 Square 25 2.5 6.1 2.5 C350 ASNZS 1133-C350L0 Brack 50X 50X 2 DUBLACE/PLUS 8.1 M ASNZS 1163-C350L0 Square 2.5 2.6 6.5 2.6 C350 ASNZS 1133-C350L0 Brack 50X 50X 2 DUBLACA/PLUS 8.10 M ASNZS 1163-C35	PROD_DESC	SHAPE	SIZE1	SIZE2	GAUGE	LENGTH	THICKNOM	GRADE	STANDARD	FINISH
Internal	75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8 🤇	3	450+	AS/NZS 1163-C450L0	Black
SONIB MED CLIP RE 6.5 NAS 1074+ASIN2S 1163-C250L0 CHS 60.3 0 3.6 6.5 3.6 C250 ASIN2S 1163-C250L0 Black 50X 20X 2 BLUE RHS 5.0 ASIN2S 1163-C250L0 Square 52 2 8 2 C350 ASIN2S 1163-C250L0 Black 2XX 25X 16 BLUE RHS 6.5 ASIN2S 1163-C250L0 Black Black 2XX 25X 10 BLUE RHS 6.5 ASIN2S 1163-C250L0 Black Black 2XX 25X 10 BLUE RHS 6.5 ASIN2S 1163-C250L0 Black Black 3X352 5 DURAGALPIUS 6.1 ASIN2S 1163-C350L0 Square 50 50 2.5 6.1 2.5 C350 ASIN2S 1163-C350L0 Pre Calvanised 40X 40X 3 BLUE RHS 8.0 MASIN2S 1163-C350L0 Square 50 2.5 2.5 C350 ASIN2S 1163-C350L0 Black 40X 40X 3 BLUE RHS 8.0 MASIN2S 1163-C350L0 Square 55 2.5 2.5 2.5 C350	40X 40X1.6 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Black
30X 30X I 6 DURAGALPLUS 8.0 M ASNZS 1183-C350.0 Square 30 30 1 6 8 1.6 C 250 ASNZS 1183-C350.0 Pre Galvanised 25X 25X I 6 DULE RHS 6.5 M ASNZS 1163-C350.0 Square 25 25 1.6 6.5 1.6 C 250 ASNZS 1183-C350.0 Black 25X 25X I 6 DULE RHS 6.5 M ASNZS 1163-C350.0 Square 25 2.5 8 2.5 C 350 ASNZS 1183-C350.0 Black 25X 25X I 6 DULR AGLPUUS 8.0 M ASNZS 1163-C350.0 Square 50 50 2.5 6.1 2.5 C 350 ASNZS 1183-C350.0 Pre Galvanised 40X 402 5 DULR AGLPUUS 8.0 M ASNZS 1163-C350.0 Square 40 40 3 8 3 C 350 ASNZS 1183-C350.0 Pre Galvanised 40X 402 5 DULE RHS 8.0 M ASNZS 1163-C350.0 Square 25 2.6 6 2 C 350 ASNZS 1183-C350.0 Pre Galvanised 25X 25X 16 DURAGLPLUS 8.0 M ASNZS 1163-C350.0 Square 25 2.6 6 2 6 2	50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
S0X 25X 2 BLUE RHS 8.0 Ash 2 C 350 Ash X2S 1183-C350.0 Black 25X 25X 16 BLUE RHS 6.5 Ash 1074-Ash X2S 1163-C350.0 Square 25 25 1.6 6.5 1.6 C350 Ash X2S 1163-C350.0 Black 25X 250 DLUE RHS 6.5 3.6 6.5 3.6 C 50 Ash X2S 1163-C350.0 Black 35X 3502 5 DURAGALPLUS 8.0 M ASH X2S 1163-C350.0 Square 25 2.5 6.1 2.5 C350 Ash X2S 1163-C350.0 Pre Galvanised 40X 40X 3 BLUE RHS 8.0 M ASH X2S 1163-C350.0 Square 40 3 8 3 C 550 Ash X2S 1163-C350.0 Black 40X 40X 3 BLUE RHS 6.0 M ASH X2 1163-C350.0 Square 25 2 6.5 2 C 550 Ash X2S 1163-C350.0 Black 25X 25X 16 BLUE RHS 8.0 M ASH X2S 1163-C350.0 Square 25 2 6.5 1.6 C 350 Ash X2S 1163-C350.0 Brack	30X 30X1.6 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	1.6	8	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X 16 BLUE RHS 6.5 M AS 074X-AS/N2S 1163-C250L0 Square 25 25 1 6 6.5 3.6 6.5 AS 0725 1163-C250L0 Black 25X 25X 10 BLUE RHS 6.5 M AS 07X25 1163-C250L0 Square 25 25 3 6.5 3 C350 AS/N25 1163-C350L0 Pire Galamaised 50X 50Z 5 DURAGALPUS 8 10 MAS/N25 1163-C350L0 Square 50 50 50 2.5 6.1 2.5 C350 AS/N25 1163-C350L0 Pire Galamaised 40X 4022 5 BLUE RHS 8 0 M AS/N25 1163-C350L0 Square 25 2.5 6.5 2 C350 AS/N25 1163-C350L0 Black 25X 25X 16 DURAGALPUS 8 0 M AS/N25 1163-C350L0 Square 25 2.5 1.6 6.5 1.6 C350 AS/N25 1163-C350L0 Black 25X 25X 16 DURAGALPUS 8 0 M AS/N25 1163-C350L0 Square 25 2.5 1.6 6.5 1.6 C350 AS/N25 1163-C350L0 Black 25X 25X 16 DURAGALPUS 8 0 M AS/N25 1163-C350L0 Square 25 2.5 1.6 6.5 <td>50X 25X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0</td> <td>RHS</td> <td>50</td> <td>25</td> <td>2</td> <td>8</td> <td>2</td> <td>C350</td> <td>AS/NZS 1163-C350L0</td> <td>Black</td>	50X 25X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2	8	2	C350	AS/NZS 1163-C350L0	Black
SONE MED CLR PE 6.5 MAS 1074+AS/NZS 1163-C250L0 CHS 6 0.3 0.6 5.5 3.6 C250 AS/NZS 1163-C250L0 Black 35X 3502 5 DURAGALPLUS 8 0 M AS/NZS 1163-C350L0 Square 35 35 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Pre Gahamised 40X 40X3 0 BLUE RHS 8.0 MAS/NZS 1163-C350L0 Square 40 40 3 8 3 C350 AS/NZS 1163-C350L0 Black 25X 252 0 BLUE RHS 8.0 MAS/NZS 1163-C350L0 Square 40 40 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Black 25X 251 0 BLUE RHS 8.0 MAS/NZS 1163-C350L0 Square 2.5 2.5 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Gahamised 25X 251 16 BLUE RHS 8.0 MAS/NZS 1163-C350L0 Square 2.5 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Gahamised 25X 251 16 BLUE RHS 8.0	25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
25X 25X 0.8 DLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 25 3 6.5 3 C350 AS/NZS 1163-C350L0 Pice Galvanised 50X 502 S DURAGALPLUS & 0 M AS/NZS 1163-C350L0 Square 50 50 2.5 6.1 2.5 C350 AS/NZS 1163-C350L0 Pice Galvanised 40X 40X3 0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 40 40 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Black 25X 252 0 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 2 6.5 2 C350 AS/NZS 1163-C350L0 Black 25X 25X 15 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 Square 25 2.5 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pice Galvanised 25X 25X 15 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 Square 25 2.5 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pice Galvanised 25X 25X 15 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0	50NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	60.3	0	3.6	6.5	3.6	C250	AS/NZS 1163-C250L0	Black
35X 35X 5 DURAGALPLUS 8 0 M AS/NZS 1163-C350L0 Square 36 35 2.5 8 2.5 C 350 AS/NZS 1163-C350L0 Pre Galvanised 40X 40X.3 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 40 40 3 8 3 C 350 AS/NZS 1163-C350L0 Black 40X 40X.2 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 40 40 2.5 8 2.5 C 350 AS/NZS 1163-C350L0 Black 25X 25X 16 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 Square 2.5 2.5 1.6 6.5 1.6 C 350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1 6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0 Square 2.5 2.5 1.6 6.5 1.6 C 350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1 6 DURAGALPLUS 6.5 M AS/NZS 1163-C450L0 RHS 7.5 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 75X 50X 3 0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 7.5 50 3 8 3 450+ AS/NZS 1163-C450L0<	25X 25X3.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	3	6.5	3	C350	AS/NZS 1163-C350L0	Black
50X 50/2 5 DURAGALPLUS 6.1 M AS/NZS 1163-C350L0 Square 50 50 2.5 6.1 2.5 C350 AS/NZS 1163-C350L0 Pite Galvanised 40X 40/X3 0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 40 40 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Black 25X 25X 2 0 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 2 6.5 2 C350 AS/NZS 1163-C350L0 Black 25X 25X 10 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 2 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1 6 DUFAGALPLUS 8.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Black 75X 50X 2 0 C450PLUS BLUE 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450 AS/NZS 1163-C450L0 Black 75X 50X 2 0 C450PLUS BLUE 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450 AS/NZS 1163-C450L0 Black	35X 35X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
40X 40/3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 40 40 3 8 3 C350 AS/NZS 1163-C350L0 Black 25X 25X2 0 BLUE RHS 6.6 M AS/NZS 1163-C350L0 Square 25 25 2 6.5 2 C350 AS/NZS 1163-C350L0 Black 25X 25X2 0 BLUE RHS 6.6 M AS/NZS 1163-C350L0 Square 25 25 2 6.5 2 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1.6 DURAGALPLUS 6.5 M AS/NZS 1163-C360L0 Square 25 25 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1.6 DURAGALPLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 75X 60X 30 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C350L0 Black 75X 60X 30 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3	50X 50X2.5 DURAGALPLUS 6.1 M AS/NZS 1163-C350L0	Square	50	50	2.5	6.1	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
40X 40%2 5 BLUE RHS 8 0 M AS/NZS 1163-C350L0 Square 25 25 25 2 6 5 2 C350 AS/NZS 1163-C350L0 Black 30X 30X2 0 DURAGALPLUS 6.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 2 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1 6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1 6 BLUE RHS 6.5 M AS/NZS 1163-C350L0 RHS 75 50 2 8 2 450+ AS/NZS 1163-C450L0 Black 75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 50X 252 5 DURAGALPLUS 8 DUR AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450+	40X 40X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	3	8	3	C350	AS/NZS 1163-C350L0	Black
25X 25X2 0 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 2 6.5 2 C 350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1.6 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C 350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1.6 DURAGALPLUS 8 LUE 8.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C 350 AS/NZS 1163-C350L0 Pre Galvanised 75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 460+ AS/NZS 1163-C450L0 Black 40NB TUBELINE LIC 1C RP E 6.5 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 460+ AS/NZS 1163-C350L0 Black 30X 30 C450PLUS BLUE 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C350L0 Black 30X 30 C450PLUS BLUE 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3	40X 40X2.5 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	40	40	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Black
30X 30X2 0 DURAGALPLUS 8 0 M ASN/ZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C350 ASN/ZS 1163-C350L0 Pre Galvanised 25X 25X 1.6 DLUE RHS 6.5 M ASN/ZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C350 ASN/ZS 1163-C350L0 Pre Galvanised 75X 50X 2.0 C450PLUS BLUE 8.0 M ASN/ZS 1163-C450L0 RHS 75 50 2 8 2 450+ ASN/ZS 1163-C450L0 Black 75X 50X 2.0 C450PLUS BLUE 8.0 M ASN/ZS 1163-C450L0 RHS 75 50 3 8 3 450+ ASN/ZS 1163-C450L0 Black 40NB TUBELINE LGT CLR PE 6.5 M ASN/ZS 1163-C350L0 RHS 75 50 3 8 3 450+ ASN/ZS 1163-C350L0 Black 50X 25.0 DURAGALPLUS 8.0 M ASN/ZS 1163-C350L0 RHS 75 50 3 8 3 C350 ASN/ZS 1163-C350L0 Black 32NB MED NOP PE 6.5 M AS 1074+ASN/ZS 1163-C350L0 RHS 5 35 3 8 3<	25X 25X2.0 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C350 AS/NZS 1163-C350L0 Pre Galvanised 25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0 RHS 75 50 2 8 2 450+ AS/NZS 1163-C450L0 Black 75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 400HB TUBELINE LG TCL RP E 6.5 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 50X 25X.2 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 32NB MED NOP PE 6.5 M AS/NZS 1163-C350L0 RHS 75 50 3 8 3 C350 AS/NZS 1163-C350L0 N.P. (No OII oP anised 35X 35X.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 <td>30X 30X2.0 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0</td> <td>Square</td> <td>30</td> <td>30</td> <td>2</td> <td>8</td> <td>2</td> <td>C350</td> <td>AS/NZS 1163-C350L0</td> <td>Pre Galvanised</td>	30X 30X2.0 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	Square	30	30	2	8	2	C350	AS/NZS 1163-C350L0	Pre Galvanised
25X 25X1 6 BLUE RN 6 5 M AS/NZS 1163-C350L0 Square 25 25 1.6 6.5 1.6 C 350 AS/NZS 1163-C350L0 Black 76X 50X 2.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 40NB TUBELINE LGT CR PE 6.5 M AS/NZS 1163-C350L0 CHS 48.3 0 2.9 6.5 2.9 C350 AS/NZS 1163-C350L0 Black 50X 252.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 RHS 75 50 3 8 2.5 C350 AS/NZS 1163-C350L0 Black 30X 252.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 RHS 50 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Black 32NB MED NOP PE 6.5 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 25 2.5 1.6	25X 25X1.6 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Pre Galvanised
755 500 2 0 C450PLUS BLUE 8 0 M AS/NZS 1163-C450L0 RHS 75 50 2 8 2 450+ AS/NZS 1163-C450L0 Black 76X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C250L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C350L0 Black 32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0 RHS 50 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Pre Galvanised 35X 35X3 0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X3 0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 25 2.5 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X 25 BLUE RHS 6.5 M AS/NZS 1163-C450L0 Square 25 2.5 <td< td=""><td>25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0</td><td>Square</td><td>25</td><td>25</td><td>1.6</td><td>6.5</td><td>1.6</td><td>C350</td><td>AS/NZS 1163-C350L0</td><td>Black</td></td<>	25X 25X1.6 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	1.6	6.5	1.6	C350	AS/NZS 1163-C350L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0 CHS 48.3 0 2.9 6.5 2.9 C350 AS/NZS 1163-C450L0 Black 75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 50X 25X2 5 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 RHS 50 25 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Pre Galvanised 32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 42.4 0 3.2 6.5 3.2 C250 AS/NZS 1163-C350L0 N.P. (No Oil or Paint) 35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 25X 25X1.0 BLUE RHS 8.0 M AS/NZS 1163-C450L0 Square 25 25 6.5 2.5 C350 AS/NZS 1163-C450L0 Black 25X 25X1.0 BLUE RHS 0.0 AS/NZ	75X 50X 2.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	2	8	2	450+	AS/NZS 1163-C450L0	Black
40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0 CHS 48.3 0 2.9 6.5 2.9 C350 AS/NZS 1163-C350L0 Black 75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C350L0 Black 50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C250L0 CHS 42.4 0 3.2 6.5 3.2 C250 AS/NZS 1163-C250L0 N.O.P. (No Oil or Paint) 35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 100X 50X 5.0 C450PLUS DURAGAL 8.0 M AS/NZS 1163-C450L0 Square 25 2.5 6.5 2.5 C350 AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 11	75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 75 50 3 8 3 450+ AS/NZS 1163-C450L0 Black 50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 RHS 50 25 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Pre Galvanised 32NB MED NOP PE 6.5 M AS 1/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 25X 25X.1 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X.2 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 2.5 6.5 2.5 C350 AS/NZS 1163-C350L0 Black 100X 50X 2.3 C450PLUS DURAGAL 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5.3 8 2.3 450+ AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS	40NB TUBELINE LGT CLR PE 6.5 M AS/NZS 1163-C350L0	CHS	48.3	0	2.9	6.5	2.9	C350	AS/NZS 1163-C350L0	Black
50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0 RHS 50 2.5 8 2.5 C350 AS/NZS 1163-C350L0 Pre Galvanised 32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C350L0 Square 35 35 3 8 3 C250 AS/NZS 1163-C350L0 N.O.P. (No Oil or Paint) 35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X 25 BLUE RHS 6.5 M AS/NZS 1163-C450L0 Square 25 2.5 6.5 2.5 C350 AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS DURAGAL 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 6 450+ AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163	75X 50X 3.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	75	50	3	8	3	450+	AS/NZS 1163-C450L0	Black
32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 42.4 0 3.2 6.5 3.2 C250 AS/NZS 1163-C250L0 N.O.P. (No Oil or Paint) 35X 35X 30 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X 20 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 25X 25X 25 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X 25 BLUE RHS 6.5 M AS/NZS 1163-C450L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS 1163-C450L0 Black 100X 50X 2.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 6 450+ AS/NZS 1163-C450L0 Black	50X 25X2.5 DURAGALPLUS 8.0 M AS/NZS 1163-C350L0	RHS	50	25	2.5	8	2.5	C350	AS/NZS 1163-C350L0	Pre Galvanised
35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 3 8 3 C350 AS/NZS 1163-C350L0 Black 35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X2.5 BLUE RHS 6.5 M AS/NZS 1163-C450L0 Square 25 25 6.5 2.5 C350 AS/NZS 1163-C450L0 Black 100X 50X2.3 C450PLUS DURAGAL 8.0 M AS/NZS 1163-C450L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS 1163-C450L0 Black 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 11	32NB MED NOP PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	N.O.P. (No Oil or Paint)
35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0 Square 35 35 2 8 2 C350 AS/NZS 1163-C350L0 Black 25X 25X.16 BLUE RHS 7.3 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X.25 BLUE RHS 6.5 M AS/NZS 1163-C450L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS 1163-C450L0 In Line Galvanised 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X 100X 3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X 100X	35X 35X3.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	3	8	3	C350	AS/NZS 1163-C350L0	Black
25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0 Square 25 25 1.6 7.3 1.6 C350 AS/NZS 1163-C350L0 Black 25X 25X 25 BLUE RHS 6.5 M AS/NZS 1163-C350L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS 1163-C350L0 In Line Galvanised 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black <tr< td=""><td>35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0</td><td>Square</td><td>35</td><td>35</td><td>2</td><td>8</td><td>2</td><td>C350</td><td>AS/NZS 1163-C350L0</td><td>Black</td></tr<>	35X 35X2.0 BLUE RHS 8.0 M AS/NZS 1163-C350L0	Square	35	35	2	8	2	C350	AS/NZS 1163-C350L0	Black
25X 25X 2.5 BLUE RHS 6.5 M AS/NZS 1163-C350L0 Square 25 25 2.5 6.5 2.5 C350 AS/NZS 1163-C350L0 Black 100X 50X 2.3 C450PLUS DURAGAL 8.0 M AS/NZS 1163-C450L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS 1163-C450L0 In Line Galvanised 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Ryare 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6	25X 25X1.6 BLUE RHS 7.3 M AS/NZS 1163-C350L0	Square	25	25	1.6	7.3	1.6	C350	AS/NZS 1163-C350L0	Black
100X 50X2.3 C450PLUS DURAGAL 8.0 M AS/NZS1163-C450L0 RHS 100 50 2.3 8 2.3 450+ AS/NZS1163-C450L0 In Line Galvanised 100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 700 100 3 8 3 450+ AS/NZS 1163-C450L0 Pre Galvanised 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1	25X 25X2.5 BLUE RHS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2.5	6.5	2.5	C350	AS/NZS 1163-C350L0	Black
100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 100 50 5 8 5 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0 Square 100 100 3 8 3 450+ AS/NZS 1163-C450L0 Pre Galvanised 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6	100X 50X2.3 C450PLUS DURAGAL 8.0 M AS/NZS1163-C450L0	RHS	100	50	2.3	8	2.3	450+	AS/NZS1163-C450L0	In Line Galvanised
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 100 100 3 8 3 450+ AS/NZS 1163-C450L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS	100X 50X 5.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	100	50	5	8	5	450+	AS/NZS 1163-C450L0	Black
125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 RHS 125 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS 1163-C450L0 Square 100 100 3 8 3 450+ AS/NZS 1163-C450L0 Pre Galvanised 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 <td>75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0</td> <td>Square</td> <td>75</td> <td>75</td> <td>6</td> <td>8</td> <td>6</td> <td>450+</td> <td>AS/NZS 1163-C450L0</td> <td>Black</td>	75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0 Square 75 75 6 8 6 450+ AS/NZS 1163-C450L0 Black 100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0 Square 100 100 3 8 3 450+ AS/NZS1163-C450L0 Pre Galvanised 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 105.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZ	125X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	RHS	125	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0 Square 100 100 3 8 3 450+ AS/NZS1163-C450L0 Pre Galvanised 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+	75X 75X 6.0 C450PLUS BLUE 8.0 M AS/NZS 1163-C450L0	Square	75	75	6	8	6	450+	AS/NZS 1163-C450L0	Black
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+ AS/NZS 1163-C450L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+	100X100X3.0 DURAGALPLUS 8.0 M AS/NZS1163-C450L0	Square	100	100	3	8	3	450+	AS/NZS1163-C450L0	Pre Galvanised
25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 33.7 0 4 6.5 4 C250 AS/NZS 1163-C250L0 Black 90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+ AS/NZS 1163-C450L0 Black 20ND NETS DED DED DED DE DE DE DE DE DE DE DE DE	150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 101.6 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+ AS/NZS 1163-C450L0 Black	25NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	33.7	0	4	6.5	4	C250	AS/NZS 1163-C250L0	Black
150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0 CHS 165.1 0 5 6.5 5 C250 AS/NZS 1163-C250L0 Black 250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+ AS/NZS 1163-C450L0 Black	90NB HVY CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	101.6	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0 RHS 250 150 6 12 6 450+ AS/NZS 1163-C450L0 Black	150NB MED CLR PE 6.5 M AS 1074+AS/NZS 1163-C250L0	CHS	165.1	0	5	6.5	5	C250	AS/NZS 1163-C250L0	Black
	250X150X 6.0 C450PLUS BLUE 12.0 M AS/NZS 1163-C450L0	RHS	250	150	6	12	6	450+	AS/NZS 1163-C450L0	Black
32NB MED PTD RED SOE 6.5 M AS 1074+AS/NZS 1163-C250L(CHS 42.4 0 3.2 6.5 3.2 C250 AS/NZS 1163-C250L0 Black	32NB MED PTD RED SOE 6.5 M AS 1074+AS/NZS 1163-C250L	CHS	42.4	0	3.2	6.5	3.2	C250	AS/NZS 1163-C250L0	Black
25X 25X2.0 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0 Square 25 25 2 6.5 2 C350 AS/NZS 1163-C350L0 Pre Galvanised	25X 25X2.0 DURAGALPLUS 6.5 M AS/NZS 1163-C350L0	Square	25	25	2	6.5	2	C350	AS/NZS 1163-C350L0	Pre Galvanised



Shape, Size and Thickness Comparison Groupings

Groups	Size range	Thickness range
		XL
		L
CHS Group 1	CHS≤40NB	Μ
		Н
		ХН
		XL
		L
CHS Group 2	CHS>50NB	M
		Н
		ХН
	≤50 SHS/RHS	1.6mm
RHS Group1	25x25 - 50x50	2.0mm
	50x20 - 65x35	>2mm
		1.6mm
	≥65 SHS/RHS	2.0mm
RHS Group 2	65x65 - 150x150	>2mm
	75x50 - 200x100	9mm
		>9mm
BHS Group 3	>150 Large SHS/RHS 200x200 - 250x250	5,6 & 9mm
	250x150 - 300x100	8, 10, 12.5 & 16mm
		1.6mm
Cattle Rail	Cattle Rail	2.0mm
		>2mm





Verification Challenge:

Mass Tolerance Adjustment

Relevant when

- both domestic and export sales are made on theoretical weight basis,
- normal value is determined via 269TAC(1) relevant domestic sales.
- Relevant to XXXX (see below)





Verification Challenge:

Grade Adjustment

- Relevant to normal values determined 269TAC(1) and constructed normal values
- Strength Grade is a consideration because higher strength grades are more costly to produce

Grade Adjustment

- Circumstances in which a grade adjustment is warranted:
 - If performing a Constructed Cost for China a benchmark for the correct grade of coil is required or an adjustment is required to correct the cost difference to the appropriate grade of coil (Grade Extra).
 - If performing a Constructed Normal Value a benchmark for the correct grade of coil is required or an adjustment is required to correct the cost difference to the appropriate grade of coil (Grade Extra).
 - If performing 269TAC(1) normal value assessment ensure the domestic sales match the same grade as the exported goods and if they don't a grade adjustment is required.



Confidential Grade Extra's Price List



Identified HSS manufacturers for Verification

<u>China</u>

• Steelforce

<u>Korea</u>

• Kukje

<u>Taiwan</u>

• FEMCO



KUKJE - Korea



Verification Challenge:

Relevant, Complete and Accurate Cost Allocation

Questions exist over how Kukje's XXXX [*observation of Korean export price*] in the face of significant Hot Rolled Coil price increases



Confidential exporter specific considerations



Confidential exporter specific considerations



Confidential analysis regarding effect of averaging coil prices



FEMCO - Taiwan



Verification Challenge:

Relevant, Complete and Accurate Cost Allocation



Confidential exporter specific considerations



FEMCO has a substantial list of related parties including customers:

- FEMCO engineering and construction division
- FEMCO Manufacturing applications

Domestic sales to these customers XXXX [Confidential comment RE related parties]





FEMCO structure appear to have a common administration function across manufacturing and construction businesses. XXXX [*Confidential comment RE Structure*].





According to FEMCO Exporter Questionnaire (p.12)

- Export sales all to AS/NZS1163 C450 (at C-2)
- Domestic sales to JIS G3466 STKR400/STKR490 standard. (at C-4)

Model Comparison Grade

Standard	AS/NZS1163	JIS G3466
Grade	C450	no equivalent
	C350	STKR490 (325)
	C250	STKR400 (245)

XXXX [Confidential comment RE grade comparison]



According to FEMCO Exporter Questionnaire (p.12)

- Export sales all to AS/NZS1163 C450 (at C-2)
- Domestic sales to JIS G3466 STKR400/STKR490 standard. (at C-4)

Model Comparison Mass Tolerance

StandardAS/NZS1163JIS G3466Mass tolerance-4%-10%Uplift to Normal Value required of 6.7%





The mass tolerance on a structural product ensures the product has the required physical material to meet the design application

Australian product standard AS/NZS1163 has a tighter mass tolerance than many international standards

The tighter mass tolerance is considered in the Australian Design Standard AS4100 capacity factor which down rates the products strength due to variations in material properties including dimensional tolerances. BACKGROUND TO AS 4100 PROVISIONS ON MATERIALS

Only HSS manufactured AS/NZS1163 can be designed to AS4100 with the capacity reduction factors provided.

Similarly international design standards consider the variability in properties of their respective product standards

"Rolling light" is a term for manufacturing close to the minimum mass tolerance

Clause C2.2 of the Commentary to AS 4100 (AS 4100 Supplement 1-1999) states:

'C2.2 STRUCTURAL STEEL

The Standard has been written around the range of structural steels manufactured in Australia to the Australian Standards quoted in Clause 2.2.1. The Standards quoted are product type Standards.'

Therefore, the assumption central to AS 4100 is that all steel is manufactured in accordance with the Standards quoted in Clause 2.2.1 of AS 4100 in all respects. That is what a test certificate from a steel manufacturer is intended to warrant when it is supplied. AS 4100 relies on guaranteed values of chemical composition, mechanical properties, dimensional tolerances and methods of manufacture as specified in the nominated standards AS/NZS 1594, AS/NZS 3678, AS/NZS 3679.1, AS/NZS 3679.2 and AS 3597.

The member design Sections (5, 6, 7, 8) of AS 4100 use general expressions for steel member capacity applicable over a wide range of steels, provided that the yield stress used in design does not exceed the value of 690 MPa nominated in Clause 1.1.1(b) of AS 4100. The design provisions in these Sections were developed for the known properties and behaviour of Australian steels which comply with the above Standards.

The capacity factors nominated in Table 3.4 of AS 4100 were derived using statistical analysis of results from steel testing of material complying with the Standards listed in Clause 2.2.1 of AS 4100 using the normal distribution curves obtained from the manufacturers as at the date of preparation of AS 4100. References cited in the Commentary to AS 4100 describe in detail how the capacity factors were derived for different member types and design actions. The capacity factors are related to the design expressions used in AS 4100 for the various nominal design capacities. The Commentary to AS 4100 advises that (see C3.4 on page 13 of AS 4100 Supplement 1—1999):

AS/NZS 1163:2009 – Dimensional Tolerances

Dimension/Parameter	Tolerance	Dimension/Parameter	Tolerance
Cross-section – Variation in CHS outside diameter d_o	\pm 1%, with a minimum of ± 0.5 mm and a maximum of ± 10 mm	Cross-section – RHS/SHS corner radius	(a) Maximum outside radius $(r_{axt}) = 3t$ (b) Minimum outside radius $(r_{axt}) = 1.5t$ (for RHS/SHS with equivalent perimeter equal to 50 x 50 or less) = 1.8t (for RHS/SHS with equivalent perimeter greater than 50 x 50) where t is the section thickness in mm.
Cross-section – Variation in RHS/SHS cutside dimensions $t \rightarrow b \rightarrow d$ $t \rightarrow b \rightarrow d$ $t \rightarrow b \rightarrow d$ $t \rightarrow b \rightarrow d$	\pm 1%, with a minimum of ± 0.5 mm	Member – Twist (RHS/SHS)	Maximum value of V (see diagram) = 2 mm + 0.5 mm per metre length
Cross-section - Thickness (t)	 CHS - For d_v ≤ 406.4 mm: ±10% For d_v > 406.4 mm: ±10% with a max of ±2 mm RHS/SHS: ± 10% 	Member – Straightness	Maximum value of ∆ (see diagram) – 0.20% of total length for CHS – 0.15% of total length for RHS and SHS The straightness tolerance applies to straightness in any one plane.
Out-of-roundness (o)	$o = 2\% \text{ for hollow sections having a diameter to thickness ratio not exceeding 100, and where o = \underline{d_{o_{max}} - d_{o_{min}}}_{d_0} \times 100$	Member – Mass of Hollow Section Length	Not less than 0.96 times the nominal mass
Concavity (x_1) or Convexity (x_2) $\begin{vmatrix} side dimension b \text{ or } d \\ \hline \\$	(x_1) or $(x_2) \le$ greater of 0.8% of side dimension and 0.5mm	Member – Length Specified Length	+ 25 mm - 0 mm] Acacia Ridge Mills + 50 mm - 0 mm] Newcastle & Somerton Mills
Squareness of sides	90°±1°		







EN 10219-2:2006 (E)

EN 10219 Clause 13(c)

Side length

mm

H, B <100

H,B > 200

0.5 mm 90° ± 1°

See Table 3

± 6 % on individual delivered lengths

2 mm plus 0.5 mm/m length

over any 1 m length

0.15 % of total length and 3 mm

 $T \le 5 \text{ mm} \pm 10\%$

T > 5 mm ± 0,5 mm

sections

100 ≤ *H*, *B* ≤ 200 ± 0,8 %

Max 0.8 % with a minimum of

Tolerance

±1% with a minimum of ± 0,5 mm

± 0,6 %

6.3 Additional tolerances for out-of-roundness, accidental eccentricity and dimples may be applied to tubes of diameter ≥ 900 mm and D/T ≥ 50 when they are to be used as bearing piles or primary elements in combined walls in accordance with ENV 1993-5. In order for these additional tolerances to be applied the fabrication tolerance quality class, A, B, or C should be agreed. See Annex A.

			-	Table	2 — Tolerances on shape and mas
HSS Product Standard	Mass Tolerance	Thickness Tolerance	Ou	Characteristic	Circular hollow sections ± 1 % with a minimum of ± 0,5 mm and a maximum of ±1 0 mm
AS/NZS 1163	-4%	+/- 10%			
ASTM A500	None	+/- 10%	Thi	ickness (T)	For <i>D</i> ≤ 406,4 mm: <i>T</i> ≤ 5 mm ± 10 %
JIS 3444	+/- 10% (Note 1)	+/- 10%			$T > 5 \text{ mm} \pm 0.5 \text{ mm}$ For $D > 406,4 \text{ mm}$:
JIS 3466	+/- 10% (Note 1)	+/- 10% (Note 3)			± 10 % with a maximum of ± 2 mm
EN 10219	-6%	+/- 10% (Note 4)	Ou	it-of-roundness (<i>O</i>)	2 % for hollow sections having a diameter to thickness ratio not exceeding 100 *
			Co	oncavity/convexity (x ₁ , x ₂) ^b	-
			Sq	uareness of side (θ)	_
			Ext	ternal corner profile $(C_1, C_2, \text{or } R)$	_

on shape and mass ollow sections Square and rectangular hollow

0.20 % of total length and 3 mm

over any 1 m length

Where the diameter to thickness ratio exceeds 100 the tolerance on out-of-roundness shall be agreed The tolerance on convexity and concavity is independent of the tolerance on outside dimensions

Mass per unit length (M)

± 6 % on individual delivered lengths

Twist (V)

Straightness (e)

Mass per unit length (M



According to FEMCO Exporter Questionnaire (p.12)

- Export sales all to AS/NZS1163 C450 (at C-2)
- Domestic sales to JIS G3466 STKR400/STKR490 standard. (at C-4)

Model Comparison Mass Tolerance

Standard	AS/NZS1163	JIS G3466
Mass tolerance	-4%	-10%
Uplift to Normal Value required of 6.7%		





Confidential exporter specific considerations



Confidential exporter specific considerations



Steelforce - China











