21 December 2018

Director
Investigations 1
Anti-Dumping Commission
GPO Box 2013
Canberra ACT 2601

BY EMAIL:
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Dear Director,

Proposal for Model Control Codes to apply to Review of Measures concerning Hot Rolled Structural Steel Sections exported from Japan, Korea, Taiwan and Thailand

AUSTRALIAN INDUSTRY SUBMISSION

ONESTEEL MANUFACTURING PTY LIMITED (Liberty Steel) provides the following proposal for model control codes **(MCCs)** to be applied in the Review of Measures relating to exports of Hot Rolled Structural Steel Sections **(HRS)** from Japan, the Republic of Korea (Korea), Taiwan (except for exports by Feng Hsin Steel Co Ltd) and the Kingdom of Thailand (Thailand) to ensure the most directly comparable selection of domestically sold models to those models exported to Australia is made.

Liberty Steel expects that most if not all goods exported to Australia will be manufactured to comply with AS/NZS 3679.1:2016 - Structural Steel Part 1: Hot-rolled bars and sections (AS3679). The reason for this is that for buildings in Australia compliance to the National Construction Code (NCC) is a mandatory requirement and steel produced to AS3679 ultimately meets the deemed-to-satisfy requirements of this Code. AS4100 - Steel Structures Standard, is a primary reference for the design of structural steel elements in the NCC which in turn references steel produced to AS3679 as the deemed-to-satisfy requirements of the structural steel.

Model Matching

Apart from matching physical characteristics such as shape and size of the exported and domestically sold HRS, the key chemical and mechanical properties for consideration when model matching Structural Steel Sections; given their typical application in building construction and likely influence on price comparability; are as follows:

a) Manufactured to a standard readily suitable for welding

The Australian Hot Rolled Structural Steel Standard AS/NZS 3679.1 encompasses steels for both General Structures (where fasteners are used in fabrication) and Welded Structures. The Scope of the Standard states:

> "All grades specified in this Standard are suitable for –
>
> (a) Welding in accordance with AS/NZS 1554, Parts 1,2,5 and 7;"

The value of prequalification for welding is that the chemistry of the steel is optimal for ease, consistency and quality of welding and known welding procedures have already been established for steel meeting those chemistry requirements.

Welding Standards will typically specify a restriction on the maximum Carbon Equivalent (**CE**)[1] value the steel chemistry must meet to ensure it is readily weldable and does not require extensive testing to establish the best weld process for a range of potential chemistry variations. At the very least, in the absence of a specified CE value, steels intended for welding will have restrictions imposed on the maximum percentage carbon, manganese and a range of other alloys allowed in the steel chemistry.

The Commission should determine which of the exporters' domestic steel goods are manufactured to a Standard suitable for Welded Structures not just General Structures. Certain countries' Standards differentiate between steels for "General Structures" and steels for "Welded Structures". Standards for steels for welded structures will typically have restrictions on chemical elements or a maximum CE value specified, where Standards for steels for general structures will not.

b) Minimum Yield Strength

The Australian Hot Rolled Structural Steel Standard AS/NZS 3679.1 specifies two grades based on their minimal yield strength, ie. 300MPa and 350MPa.

The minimum yield strength of the steel, as certified to a particular Standard, is the point at which the structural steel member will start to yield and undergo permanent plastic deformation. This is the key property used for structural steel design material selection.

Whilst the minimum tensile strength is also included in structural steel Standards as an indication of how far beyond the yield point the steel can be loaded before complete failure occurs – this is not the key property considered in material selection for structural steel design, i.e. steel is not selected to achieve a certain point of failure.

These views are consistent with steel construction resources and guidelines available in various countries:

The UK's Steel Construction Info website states:

> "Yield strength is the most common property that the designer will need as it is the basis used for most of the rules given in design codes. In European Standards for structural carbon steels (including weathering steel), the primary designation relates to the yield strength, e.g. S355 steel is a structural steel with a specified minimum yield strength of 355 N/mm².
> The product standards also specify the permitted range of values for the ultimate tensile strength (UTS). The minimum UTS is relevant to some aspects of design."[2]

Hong Kong's Explanatory Materials to the Code of Practice for the Structural Use of Steel 2011 (the 'Code') similarly references yield strength as the basis for comparison of steels from various sources to be used in structural steel design:

> "Hong Kong does not produce structural steel and the intention of the Code is to allow use of steel and steel materials, such as nuts and bolts, from the major worldwide suppliers on a "level playing field" basis. Section 3 covers the use of **hot rolled steel sections**, flats, plates, hot

[1] https://en.wikipedia.org/wiki/Equivalent_carbon_content : *In welding, equivalent carbon content (C.E) is used to understand how the different alloying elements affect hardness of the steel being welded. This is then directly related to hydrogen-induced cold cracking, which is the most common weld defect for steel, thus it is most commonly used to determine weldability. Higher concentrations of carbon and other alloying elements such as manganese, chromium, silicon, molybdenum, vanadium, copper and nickel tend to increase hardness and decrease weldability.*

[2] https://www.steelconstruction.info/Steel_material_properties

finished and cold formed structural hollow sections and cold formed sections conforming to acceptable international steel product standards from Australia, China, Japan, United States of America and United Kingdom versions of European Union standards. In addition to covering normally available steel with **yield stresses** in the range from 190 N/mm2 to 460 N/mm2, this section gives design recommendations on the use of high strength steel with **yield stresses** between 460 and 690 N/mm2, and uncertified steel, whereby the **design strength** is limited to 170 N/mm2."[3]

For consideration of minimum yield strength and chemistry requirements applicable to the grades of HRS produced by the exporters for domestic and export sale, Liberty Steel urges the Commission to **request copies of the Standards to which the grades have been produced and that the requirements contained in those Standards form the basis for model matching comparison**. It is expected that an exporter's domestic sales invoices will specify the local or international Standard the steel is certified (i.e. represented/warranted) to meet.

Chemistry and mechanical property results obtained for a heat/batch of steel and recorded on a test certificate must necessarily exceed the minimum requirements for the Standard and grade to which the steel has been certified to be produced.

As such, batches of steel meeting a certain Standard grade's requirements will necessarily have a distribution of results above the minimums specified. In some instances, these batch results may exceed the minimum requirements for another (e.g. higher yield strength) grade but are **not** able to be used to justify a model match between these grades or "grade-up" the lower grade of steel as these results are unlikely to be replicated over many batches.

A test certificate is only applicable to a given batch of steel and can only certify that the given batch meets the minimum requirements of the Standard and grade to which it has been produced. Customers looking to purchase HRS for a structural building application will not base their design or selection of grades on available test certificate results but rather will purchase steel based on known properties defined by Standard grades.

Proposed Model Control Codes HRS

The table below sets out the following proposed model control codes.

Item	Category	Sub category	Sales data	Cost data	Key category
1	**Shape** (compare same shapes)	UB/UC : Universal Beam/Column	Mandatory	Optional	Yes
		PFC : Parallel Flange Channel			
		EA : Equal Angle			
		UA : Unequal Angle			
2	**Prime**	YES - P: Prime	Mandatory	Optional	Yes
		NO - NP: Non-Prime			
3	**Qualified to a Standard for Welded Structures**	YES : Qualified to a Standard for Welded Structures. The Standard specifies chemistry requirements with a maximum Carbon Equivalent value (CE or CEV) AND maximum %Carbon and %Manganese	Mandatory	Optional	Yes
		NO : Not qualified to a Standard for Welded Structures. The Standard chemistry requirements contains no maximum Carbon Equivalent value (CE or			

[3] https://www.bd.gov.hk/english/documents/code/EMSUOS2011e.pdf at p1

		CEV) specified OR no maximums specified for %Carbon and %Manganese			
4	**Minimum yield strength specified by Standard produced to**	YES - >= 265MPa: Min yield strength GREATER than or equal to 265MPa	Mandatory	Optional	Yes
		NO - <265MPa: Min yield strength LESS than 265MPa is not comparable			
5	**Size** (Depth of Section)[4]	**For Universal Beams and Columns (UB & UC):**	Mandatory	Optional	Yes
		< 200mm maximum depth			
		>=200 to <=420mm maximum depth			
		>420mm maximum depth			
		For Parallel Flange Channels (PFC):			
		<= 200mm maximum depth			
		>200mm maximum depth			

Reasoning for the Control Codes

1. **Shapes** – HRS of the same shapes need to be compared to each other due to observable pricing differences. Within the shapes there are also likely to be pricing differences based on the size.

2. **Prime** – Only Prime HRS models should be compared; NON-Prime is not comparable.

3. **Qualified to a Standard for Welded Structures -** The exported goods are invariably qualified to a readily weldable Standard (AS/NZS 3679.1:2016); the domestic sales need to be compared to this standard.

4. **Minimum yield strength** - The exported goods are exported to AS/NZS 3679.1:2016 with a minimum yield strength of 300MPa. A copy of the Australian Standards is at Confidential Attachment 1. Liberty Steel considers the comparable Standard grade for domestic sales in the exporters home markets is that with a minimum yield strength of at least 265MPa (refer to the standards for Korea and Japan). The next comparable Korea/Japan Standard grade specifies a minimum yield strength of 355MPa. Liberty Steel considers that comparison to this higher Standard grade are preferable where there are no comparable sales to the proposed Standard grade.

5. **Size** – It is likely that smaller sized sections which are slower to produce will have observable price differences to the larger sizes.

FOR AND ON BEHALF OF THE AUSTRALIAN INDUSTRY APPLICANT

[4] Depth of Section as measured from the top of the section to the bottom – refer Non Confidential Attachment 1: OneSteel manufacturing – 7th edition Hot Rolled Structural Steel Products, UB- p14, UC-p16, PFC-p19.