



## Information Bulletin: Structural Steel and Elevated Boron

CWB is making the Canadian welding sector aware of the issues in the global welding industry related to elevated levels of boron in structural steel originating primarily from offshore steel producers and the potential welding related issues that may result.

CSA and ASTM material standards have historically not provided specific limits on boron as it has not been used nor is being used as an intentional alloying element in North American steel production. The addition of boron at elevated levels may change the weldability of a material, specifically around hardness and crack sensitivity. At present, CSA and ASTM material standards (such as CSA G40.20/21) do not contain specific limits on boron which means that a material with elevated levels of boron may technically meet the CSA or ASTM material specification.

CWB supports the recommendations of the Canadian Institute of Steel Construction (CISC) as an interim measure, specifically that:

1. *Specify only structural steels that are CSA G40.20/.21 or ASTM as per CSA S16 or CSA S6*
2. *Specify that the steels be produced only in Canada, United States or EU countries (this includes bolts)*
3. *Specify material traceability and records of mill test certificates by the fabricator*
4. *If you are willing to accept offshore steel, then mandate:*
  - a. *A total maximum boron of 0.0008%*
  - b. *Material testing of each steel batch to confirm the steels meet or exceed CSA G40 or the applicable ASTM Standards and the maximum boron specified in a. above*
  - c. *Testing of the steel to be performed in Canada by an ISO 17025 accredited testing laboratory with the appropriate testing scope*

*Source: CISC Bulletin, November 2016*

CWB is active in discussions with various CSA Technical Committees that may be impacted by this issue, including CSA S16 and S6, and supports the modification of CSA material standards to provide specific limits on boron and other alloying elements.

In addition, CWB certified clients with accepted welding procedures should validate the boron levels in supplied materials prior to welding with these accepted procedures. CWB recommends that if elevated levels of boron are found, procedure qualification testing to validate the welding procedure should be completed specifically to confirm the toughness properties in the heat affected zone.

CWB Certified clients or other interested parties may contact the CWB Office of Public Safety should you have any questions on this issue.

In addition, below are links to Industry Association information and bulletins related to this issue (click on name to access):

- Canadian Institute of Steel Construction (CISC)
- Heavy Engineering Research Association (HERA), New Zealand
- Standards Australia