

Title: Testing Frequency of Heat Treated Plate

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Revision: 0

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Purpose: Clarify that special material testing frequency applies to plate heat treated by tank manufacturer.

Source: D Miller email to A Baxter dated Feb 27, 2026

Impact: Improved clarity on the standard

Discussion:

CB&I staff have made the observation that 4.2.8 doesn't make technical sense and calls for something that I don't think anyone is doing.

Here's what doesn't now make sense, how it probably happened, and how to fix it:

- Heat treatment of plate (when needed) almost always happens at a steel mill.
- The normal test frequency rule for plate heat treated plate at a steel mill comes from ASTM standards A6 and A20.
- Those ASTM stds call for the higher frequency of every-plate-as-heat-treated **only for the quenched and tempered heat treatment** (see A20, 11.1.1). ASTM's reason is that Q&T heat treatment has a lot more risk of inconsistency from plate to plate than normalized.
- I don't think anyone in the tank industry when they need to order normalized plate is asking the mill to test every plate-as-heat-treated. There is no need to go beyond ASTM test frequency for plates heat treated at the mill as is typical.
- Almost all of 4.2.8 is talking about plates heat treated after they ship from the mill and are being heat treated at a tank manufacturer's fab shop. When this rare event does happen, it's often in the context of some hot forming operation. Note that 4.2.8 has several references to hot forming.
- If a fab shop is heat treating plate or hot forming them, it will probably not be as well controlled or consistent as happens in a mill production line. I think that less controlled situation is what 4.2.8 is thinking of when it calls for special high frequency testing.
- Back in 650's 9th ed (1993), only the first two parts of the Heat Treatment of Plates section exist, i.e. what is now 4.2.8.1 and 4.2.8.2. 4.2.8.3 and 4.2.8.4 were added in the 10th edition.
- I think that the two added sections were meant to apply only to the same heat-treat-by-fabricator situation as the first two subsections. But at that time they forgot to adjust the last sentence of what is now 4.2.8.1.
- The bullet on 4.2.8.4 is proposed to be removed since there is no TANK purchaser option there. Note also that the "PLATE purchaser" referenced in 4.2.8.1, 4.2.8.2, and 4.2.8.3 is NOT a tank purchaser, so it's correct that no bullets belong there either.

Proposal:

4.2.8 Heat Treatment of Plates

4.2.8.1 When specified by the plate purchaser, fully killed plates shall be heat treated to produce grain refinement by either normalizing or heating uniformly for hot forming. If the required treatment is to be obtained in conjunction with hot forming, the temperature to which the plates are heated for hot forming shall be equivalent to and shall not significantly exceed the normalizing temperature. If the treatment of the plates is not specified to be done at the plate producer's plant, ~~testing shall be carried out in accordance with 4.2.8.2.~~ the provisions of 4.2.8.2 through 4.2.8.4 shall also apply."

4.2.8.2 When a plate purchaser elects to perform the required normalizing or fabricates by hot forming (see 4.2.8.1), the plates shall be accepted on the basis of mill tests made on full-thickness specimens heat treated in accordance with the plate purchaser's order. If the heat-treatment temperatures are not indicated on the contract, the specimens shall be heat treated under conditions considered appropriate for grain refinement and for meeting the test requirements. The plate producer shall inform the plate purchaser of the procedure followed in treating the specimens at the steel mill.

4.2.8.3 On the purchase order, the plate purchaser shall indicate to the plate producer whether the producer shall perform the heat treatment of the plates.

~~•~~ **4.2.8.4** The tensile tests shall be performed on each plate as heat treated.

The bullet on 4.2.8.4 is proposed to be removed