

Lumber

What is Heart Center Lumber?

Heart Center

The soft core in the center of the log.

Boxed Heart Lumber

This describes pieces sawn at the mill with the heart center included in the board.

Free of Heart Center(FOHC) Lumber

This includes only those pieces sawn at the mill to eliminate the heart center material.

Heart Center Lumber is Not Suitable for Use in Cooling Towers

The Cooling Technology Institute recognizes the inadequacy of heart center lumber for cooling tower construction. *CTI STD-103 "Standard Specifications for the Design of Cooling Towers with Redwood Lumber"* and *CTI STD-114 "Standard Specifications for the Design of Cooling Towers with Douglas Fir Lumber"* both state explicitly that "boxed heart shall not be permitted."

As lumber goes through cycles of alternate wetting and drying, the wood swells and shrinks twice as much along each growth ring as it does across growth rings. Internal stresses build up, making the board warp and twist.

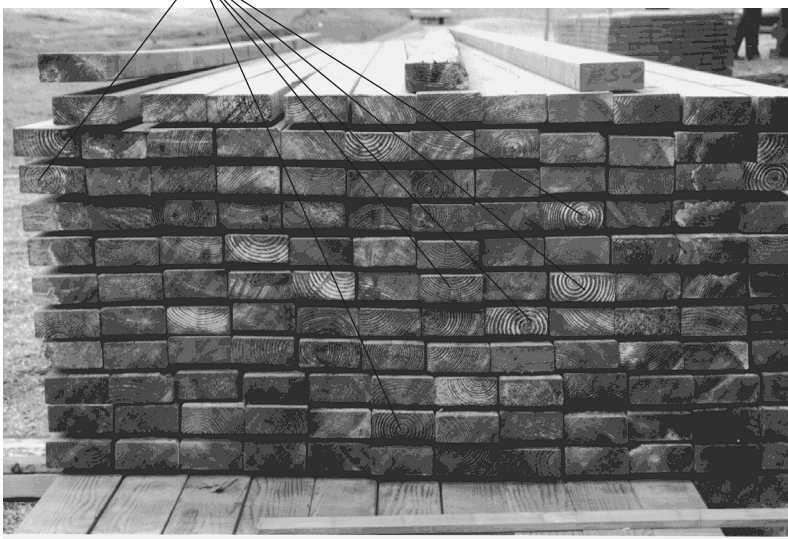
This problem becomes severe in boards containing heart centers. Since these boards usually contain complete circles of growth rings, the expansion of

the rings is constrained in a circumferential direction — the swelling has no place to go. Internal stresses in the rings have no opportunity to be relieved nondestructively. So, stress relief occurs in the form of excessive distortions which greatly reduce the load carrying capacity of the board.

These same stresses in boxed heart members may also relieve themselves in the form of cracks and splits — usually on the face closest to the heart center. These openings in the treated surface offer pathways for fungal attack on the untreated interior wood, leading to premature decay.

By contrast, FOHC lumber contains only incomplete growth rings which have two free surfaces where stress relief can occur. The result is decreased warpage, decreased twisting and increased load bearing capacity — a superior construction material.

Heart Center
Material



The Marley Difference

We order only FOHC lumber from the mill; we also inspect and sort each shipment to eliminate any boxed heart material. Mills are allowed to provide 5% heart center even when FOHC is specified. So, our lumber costs more to start with, and our inspection adds some additional cost, but our thorough procedures assure you that your tower will be free from inferior material.

Despite the general recognition that boxed heart lumber is not acceptable, some cooling tower suppliers continue to fail to

meet the CTI standards. They may provide boxed heart material rather than the more expensive and structurally superior FOHC lumber required by the standards.

The lumber shown on the front page was photographed at a competitor's construction site. Even though the specifier called for lumber in accordance with CTI STD-114, the supplier provided material with numerous boxed heart pieces. Clearly, the purchaser did not get what he thought he paid for.

How to Specify

Include in your specification very explicit language, such as the following:

For Douglas Fir

The cooling tower shall be designed and supplied in accordance with CTI STD-114, including Section 6.1 as follows: "Grades of Douglas fir to be used in cooling tower construction shall be in accordance with the WCLIB Grading Rules or WWPA Grading Rules, except boxed heart shall not be permitted."

For Redwood

The cooling tower shall be designed and supplied in accordance with CTI STD-103, including Section 6.1 as follows: "Grades of redwood to be used for the framework members in cooling tower construction shall be in accordance with the 'RIS Specifications,' Sections 7 and 8, Specifications for Structural Grades of California Redwood Lumber, except that boxed heart shall not be permitted."

Finally, inspect the material shipped to your site. Don't settle for material that won't hold up in service.

To order copies of CTI publications, contact:

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