

Heat-Resistant Adhesives (HRA) and Finger-Jointed Lumber

- HRA and Non-HRA marks added to finger-jointed lumber gradestamps.
- HRA finger-jointed lumber used where fire ratings required by building codes for wood construction.
- Non-HRA finger-jointed lumber can be used for most single-family home construction under current building codes.

Background

Finger-jointed lumber and other structural-glued products have gained wide acceptance in the building and construction industry. These products are accepted for use under both the International Building Code (IBC) and the International Residential Code (IRC), and are considered interchangeable with solid-sawn dimension lumber of the same size, grade and species.

Western Wood Products Association is the West's top agency for finger-jointed lumber quality control, providing services to more finger-jointed lumber mills than any other Western grading agency.

In 2006, as part of the North American wood products industry's continuing effort to ensure the performance of its products, research was initiated to better understand the performance of adhesives used in end-jointed lumber in fire-resistance-rated assemblies. Fire tests on finger-jointed lumber assemblies were conducted by the American Forest & Paper Association (AF&PA), in cooperation with the USDA Forest Products Laboratory and Forintek Canada Corp.

As a result of the tests, the American Lumber Standard Committee, Inc. in early 2007 revised its Glued Lumber Policy to add elevated-temperature performance requirements for labeling finger-jointed lumber. The amended policy established two designations on gradestamps for finger-jointed lumber.

Finger-jointed lumber gradestamps

Products joined with qualified heat-resistant adhesives include the designation "HRA" in the grademark (Fig. 1). Finger-jointed lumber joined with other adhesives is marked as "Non-HRA" (Fig. 2).



Fig. 1: Finger-jointed lumber joined with heat-resistant adhesives are marked with the designation HRA .



Fig 2: Finger-jointed lumber carrying the Non-HRA designation.

Finger-jointed lumber with Non-HRA designation in the gradestamp should not be used in assemblies where fire-resistance ratings are required.

Use of HRA and Non-HRA lumber

IBC Section 2303.1.1 Sawn Lumber, states, "Approved end-jointed lumber is permitted to be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required to have fire resistance rating shall have the designation "Heat Resistant Adhesive" or "HRA" included in its mark." The HRA marks provide regulators and users information to identify which finger-jointed products meet elevated-temperature performance requirements.

HRA-marked finger-jointed lumber should be used for assemblies that require a fire resistance rating under the IBC and IRC. Typically, fire ratings are required for multistory or multifamily structures in separations between living units. Common walls in commercial structures may also require fire rated assemblies.

Non-HRA grademarked lumber is suited for most single-family detached homes that do not require fire-rated assemblies.

Performance testing

Heat-resistant adhesives are evaluated according to the ASTM standard D7374. This protocol requires an adhesive to be exposed to elevated temperatures during a standard ASTM standard E119 fire test of a load-bearing end-jointed stud-wall assembly loaded to 100 percent of the lumber's allowable design load. WWPA is approved by the American Lumber Standard Committee, Inc. (ALSC), under U.S. Department of Commerce (DOC) Voluntary Product Standard PS-20, to certify structural-glued products in all species. The American Lumber Standard PS-20 provides the framework for quality control of structural-glued lumber under its Glued Lumber Policy, which results in predictable, reliable products that may be used for structural purposes with confidence. DOC PS-20 is the referenced standard for lumber products in the building codes.

References

ASTM standard D7374 Standard Practice for Evaluating Elevated Temperature Performance of Adhesives Used in End-Jointed Lumber.

ASTM standard E119 Test Methods for Fire Tests of Building Construction and Materials.