TECHNICAL BULLETIN

STRUCTURAL BOARD ASSOCIATION

Representing the OSB Industry

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COMPARISON OF ORIENTED STRANDBOARD (OSB) AND CONSTRUCTION PLYWOOD (CDX)

Standards and Codes

OSB wood structural sheathing panels are performance certified for the same sheathing end use as plywood under U.S. Department of Commerce Voluntary Product Standard **PS2 Performance Standard for Wood-based Structural-use Panels.** In Canada, OSB panels are performance certified for structural sheathing end uses under Canadian Standard **CSA O325 Construction Sheathing.** Both these Standards set out durability requirements that measure the retained bending strength under cyclic wet and dry conditions. The performance requirements for load carrying capacity, deflection between spans, fasteners holding, durability of the glue bond and thickness swell are the same for OSB and CDX plywood. However, because OSB is a solid panel, it has higher shear-through-thickness strength and greater stiffness than the equivalent thickness of plywood. Other U.S. and Canadian standards cover different types of plywood.

Certification

In North America, OSB structural panels and CDX Plywood are certified to meet the PS2 and CSA O325 Standards by agencies such as APA, TECO, and PSI. These certification agencies are accredited by the US National Institute of Standards and Technology or the Standards Council of Canada. Other accredited certification agencies in Canada are COFI and Warnock Hersey Inc.

Raw Material

OSB and CDX Plywood are both manufactured from freshly harvested logs. Because OSB manufacture takes the tree apart by slicing the log in the long grain direction, it can use trees of varying size and shape which are not suitable for plywood or lumber. CDX plywood requires relatively larger logs that are straight and of relative uniform size so that they may be rotated on a lathe and peeled into sheets of veneer.

Both OSB and CDX plywood can use the same species of wood, however, OSB tends to use aspen from naturally regenerating forests in Canada and Central North America and southern yellow pine and mixed hardwoods from plantations and wood lots in the Southern U.S. CDX plywood on the other hand, uses second growth peelable douglas fir in the Western U.S. or southern yellow pine in the South. As there are regional variations throughout North America in veneer characteristics, CDX plywood is not produced in Canada, however, it is available in the Canadian market.

Appearance

OSB is manufactured from precisely cut strands and then formed in alternating layers like plywood with the length of the strands in the long panel direction on both face layers and in the cross panel direction in the two core layers. The solid OSB panel has the same face and back without any knots, knot holes, core gaps or open splits. OSB is also bonded with "Exterior Type" resin binders.

CDX Plywood is manufactured with one 'C' veneer face which allows knots, narrow splits, open knot holes and voids, a 'D' veneer core and a 'D' veneer back. The 'D' veneer grade allows large knots, open knot holes, voids and long tapered splits. The 'X' stands for "Exterior" meaning that the plies are held together by "Exterior Type" glue bonds.

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Performance Under High Humidity

Both OSB and CDX Plywood are classified as "Exposure I" durability. This means that these panels provide an exposure durability to resist the effects of normal construction delays, or other conditions of similar severity. The noticeable difference between OSB and CDX plywood under extended high moisture conditions is that the OSB surface may become uneven and rough due to the swelling of the surface strands. Under these conditions, the edges may swell somewhat, however, precise manufacturing procedures along with modern edge coating systems minimize the edge swell. On the other hand, CDX plywood may warp and show delamination due to the uneven stresses developed in the panel and local areas of bond failure may occur around knots, knot holes and along splits. SBA has conducted several round - robin tests to monitor thickness swell and other physical properties of its members products.

Shear Walls and Diaphragms

OSB structural panels and CDX plywood have been extensively tested for use in shear walls and diaphragms. Both panels are recognized by the U.S. and Canadian Model Building Codes as having the same performance under wind and seismic loads.

Environment

OSB mills are required to meet strict environmental standards for air and water discharge and workplace health. OSB's environmental attributes are the use of small diameter fast growing trees, the maintenance of fully cured waterproof and boilproof glue bonds, lack of measurable formaldehyde release (easily meets international standards for formaldehyde offgassing), and has no detrimental affect on landfills. OSB may be burned as fuel without discharging highly toxic gases.

OSB resource forests are self-regenerating and the public forest user must return harvested areas into free growing sites after removing the trees.

Summary

The OSB structural panel is an economical popular alternative to CDX plywood as it meets the same performance standards and has similar characteristics in structural sheathing and engineered uses. An engineered wood panel, OSB can be manufactured to meet the needs of a particular end use and its large master panel size provides many options for cut to size industrial uses. Its unique texture also makes it an attractive panel for decorative uses.