

Information About Indoor Pools

Introduction

The complexity of designing an indoor pool structure requires the services of a qualified design professional. These unique structures provide many challenges to design professionals because of the environment created by high moisture, elevated temperatures, and chemicals. Special attention must be paid to provide protection to the structural components, which may deteriorate in these conditions. Trus Joist® engineered lumber products (ELP) have been used successfully in roof and floor systems over pools when proper design considerations have been followed. The following information is provided to assist the design professional in specifying Trus Joist® products when such products are determined to be suitable for indoor pool environments.

Moisture Control

In the United States, a dry-service condition is defined as the condition in which the average moisture content (MC) of the wood member does not exceed 16%. In Canada, the average MC over a year must be 15% or less and may not exceed 19%. A wet-service condition is defined as all service conditions other than dry.

The table below is taken from the Timber Construction Manual (Fifth Edition, 2005, American Institute of Timber Construction, Englewood, Colorado, A Wiley-Interscience Publication, John Wiley & Sons), and relates moisture contents of wood under certain dry-bulb temperature and relative humidity conditions.

Temp Dry Bulb, (°F)	Relative Humidity (%)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	98
30	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3	26.9
40	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.3	13.5	14.9	16.5	18.5	21.0	24.3	26.9
50	1.4	2.6	3.6	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.3	11.2	12.3	13.4	14.8	16.4	18.4	20.9	24.3	26.9
60	1.3	2.5	3.6	4.6	5.4	6.2	7.0	7.8	8.6	9.4	10.2	11.1	12.1	13.3	14.6	16.2	18.2	20.7	24.1	26.8
70	1.3	2.5	3.5	4.5	5.4	6.2	6.9	7.7	8.5	9.2	10.1	11.0	12.0	13.1	14.4	16.0	17.9	20.5	23.9	26.6
80	1.3	2.4	3.5	4.4	5.3	6.1	6.8	7.6	8.3	9.1	9.9	10.8	11.7	12.9	14.2	15.7	17.7	20.2	23.6	26.3
90	1.2	2.3	3.4	4.3	5.1	5.9	6.7	7.4	8.1	8.9	9.7	10.5	11.5	12.6	13.9	15.4	17.3	19.8	23.3	26.0
100	1.2	2.3	3.3	4.2	5.0	5.8	6.5	7.2	7.9	8.7	9.5	10.3	11.2	12.3	13.6	15.1	17.0	19.5	22.9	25.6
110	1.1	2.2	3.2	4.0	4.9	5.6	6.3	7.0	7.7	8.4	9.2	10.0	11.0	12.0	13.2	14.7	16.6	19.1	22.4	25.2
120	1.1	2.1	3.0	3.9	4.7	5.4	6.1	6.8	7.5	8.2	8.9	9.7	10.6	11.7	12.9	14.4	16.2	18.6	22.0	24.7
130	1.0	2.0	2.9	3.7	4.5	5.2	5.9	6.6	7.2	7.9	8.7	9.4	10.3	11.3	12.5	14.0	15.8	18.2	21.5	24.2
140	0.9	1.9	2.8	3.6	4.3	5.0	5.7	6.3	7.0	7.7	8.4	9.1	10.0	11.0	12.1	13.6	15.3	17.7	21.0	23.7
150	0.9	1.8	2.6	3.4	4.1	4.8	5.5	6.1	6.7	7.4	8.1	8.8	9.7	10.6	11.8	13.1	14.9	17.2	20.4	23.1

(1) Numbers to the right of the heavy line represent wet-use service conditions (16% or greater for glue laminated timber and greater than 19% for sawn timbers.)

16% 19%

Most engineered lumber products will equilibrate to a lower moisture content than what is shown in the table. Trus Joist® products may be considered for use in indoor pool applications only if dry-service conditions exist and will be consistently maintained. Weyerhaeuser offers Parallam® Plus PSL, which can be used in applications where the expected moisture content is greater than 16%.

Moisture control is critical to the performance and longevity of wood products subjected to a potentially high MC. Ceiling and floor plenums must be well ventilated and relative humidity controlled to ensure dry-service conditions. Insulation should be properly installed so that condensation does not form and collect in the plenum.

Humidity actuated ventilation (dehumidifier) equipment should be used in high moisture environments. If humidity and temperature are controlled, dry-service conditions can be maintained. The design of an adequate ventilation system will require the services of a qualified design professional. In addition, the owner should be educated regarding the importance of a well maintained ventilation system is critical.

Additional Design Considerations

Stabilizing the compression edges of structural members is always an important design requirement. Usually, roof or floor decking is adequate at providing member stability. The designer of record must determine what material to specify and must consider the effects of a potentially high MC when selecting materials and connections. Sufficient bearing length is another important design consideration, as well as deflection performance.

Protection of Metal Hardware

The environment in a pool structure is corrosive because of the presence of chlorine and humidity, so it is very important to use corrosion-resistant fasteners and connectors. Always consult fastener and connector manufacturers' literature for coating guidance and requirements in addition to the guidance below. Though corrosion cannot be completely prevented, the following guidelines will slow the process:

1. Stainless steel or hot-dip-galvanized fasteners (meeting ASTM A 153 standards) and connectors (meeting ASTM A653 Class G185 sheet standards) should be used for protection.
2. Do not place non-galvanized and galvanized metals in contact with each other. This includes straps and hangers for light fixtures, fire sprinkler systems, or mechanical units; galvanized nails in stainless steel connectors (or vice versa).
3. Steel and aluminum products should not be used in direct contact with treated wood. Standard steel nails can corrode and rust.
4. Damage to galvanized coatings caused in handling or shipping must be repaired. Visual inspection is required after installation to identify such areas and an application of a 95% zinc coating, in the form of zinc paint, should be applied in the field to any such areas.

Performance

Weyerhaeuser product warranties are applicable provided the enclosed pool environment causes no material degradation. However, Weyerhaeuser does not warrant any products that have been treated by non-approved treaters. The designer of record is responsible for deciding whether Trus Joist® products are suitable for the specific application based on this document and additional Weyerhaeuser literature recommendations.