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Legacy report on the 2000 International Building Code®, the 2000 International Residential Code®, and the 2002 Accumulative Supplement to the International Codes™, the BOCA® National Building Code/1999, the 1999 Standard Building Code®, the 1997 Uniform Building Code™ and the 1998 International One-and Two-Family Dwelling Code®

DIVISION: 06—WOOD AND PLASTICS
Section: 06070—Wood Treatment

Hager Wood Preserving
1545 Marquette Street S.W.
P.O. Box 912
Grand Rapids, MI 49509

EVALUATION SUBJECT:

D-BLAZE FIRE-RETARDANT-TREATED LUMBER AND PLYWOOD

J. H. Baxter & Co.
1700 South El Camino Real
P.O. Box 5902
San Mateo, CA 94002

REPORT HOLDER:

CHEMICAL SPECIALTIES, INC.
ONE WOODLAWN GREEN, SUITE 250
200 EAST WOODLAWN ROAD
CHARLOTTE, NORTH CAROLINA 28217

Permapost Products, Company
4066 SE Tualatin Valley Highway
P.O. Box 100
Hillsboro, OR 97123

ADDITIONAL LISTEES:

Quality Forest Products
RR 1, Box 406-QF, HWY 301S
Enfield, NC 27823-9801

Bestway Enterprises, Inc.
3877 Luker Road
Courtland, NY 13045

Wood Treater of Buffalo Co., Inc.
100 Botsford PLACE
Buffalo, NY 14216

Bowie-Sims-Prange Treating Corp.
1400 West Crosby Road
P.O. Box 819089
Dallas, TX 75381-9089

Chicago Flameproof
1200 South Lake Street
P.O. Box 318
Montgomery, IL 60538

Coastal Lumber Company
385 Waterway Road
Oxford, PA 19363

Dayton Flameproof and Wood Preserving/Requarth Lumber Co.
447 East Monument Avenue
Dayton, OH 45402

Eastex Forest Products
5429 Hartwick
Houston, TX 77093

Fontana Wood Preserving, Inc.
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P.O. Box 1070
Fontana, CA 92335

1.0 SUBJECT

D-Blaze Fire-Retardant-Treated Lumber and Plywood

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

- 2.1 Flame spread
2.2 Structural Performance
2.3 Corrosiveness
2.4 Hygroscopicity

3.0 DESCRIPTION

3.1 GENERAL

D-Blaze interior fire-retardant-treated lumber and plywood are pressure-impregnated with Chemical Specialties, Inc. D-Blaze fire-retardant chemicals in accordance with the American Wood Preservers Association Standards C20 and C27 and documented quality control procedures. The additional listees in this evaluation report are D-Blaze licensees whose treatment facilities are under quality control program with audit inspections by Underwriters Laboratories Inc. and Timber Products Inspection, Inc.

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3.2 FLAME SPREAD

3.2.1 Lumber: It has been determined that D-BLAZE treated lumber of the following species has a flame spread index of 25 or less when subjected to ASTM E 84 tests of 30 minute duration without evidence of significant progressive combustion, and shall be permitted for use in interior finish construction applications.

Southern Pine	Engelmann Spruce
Ponderosa Pine	White spruce
Douglas Fir	Alpine Fir
Western Hemlock	Balsam Fir
Red Pine	Lodgepole Pine
White Fir	Hem-Fir
Basswood	Jack Pine
Red Oak	Red Spruce
Spruce-Pine-Fir	Black Spruce

3.2.2 Plywood: It has been determined that D-BLAZE treated plywood of the following species has a flame spread index of 25 or less when subjected to ASTM E 84 tests of 30 minute duration without evidence of significant progressive combustion, and shall be permitted for use in interior finish construction applications.

Southern Pine	Douglas Fir
Lauan	Red Pine

3.3 STRUCTURAL PERFORMANCE

The strength properties of lumber, when treated with D-Blaze fire-retardant chemicals and used in applications at ambient temperatures up to 80° F (26.7° C) and up to 150° F (65° C), shall be subject to the strength design factors shown in Tables 1 and 2, respectively.

D-Blaze treated plywood as noted in Section 3.2.2, when treated with D-Blaze fire-retardant chemicals and used in applications at temperatures up to 170° F (76° C), shall be subject to the span limitations shown in Table 3.

Fastener capacity utilized in D-Blaze treated wood shall be the allowable design capacity for non-treated wood multiplied by the applicable compression parallel-to-grain and perpendicular-to-grain reduction factor, as specified in Table 1 or 2 of this report, as applicable.

3.4 CORROSION

Fasteners used in D-Blaze interior fire-retardant-treated lumber and plywood shall be 2024-T3 aluminum, SAE 1010 steel or hot-dipped zinc galvanized steel, or other suitable corrosion-resistant material.

The corrosion rate of 2024-T3 aluminum, SAE 1010 steel or hot-dipped galvanized steel in contact with wood is not increased by D-Blaze fire-retardant treatment when products are installed as recommended by the manufacturer.

3.5 HYGROSCOPICITY

D-Blaze treated lumber and plywood is an interior Type A fire-retardant wood in accordance with the American Wood Preservers Association Standards C20 and C27.

4.0 INSTALLATION

4.1 GENERAL

Structural systems which include D-Blaze fire-retardant-treated lumber or plywood shall be designed and installed in accordance with the applicable code using the appropriate lumber design value adjustment factors and plywood spans from Tables 1, 2 and 3 of this report. Ventilation shall be provided in accordance with the applicable code.

4.2 LIMITATIONS

D-Blaze fire-retardant-treated wood products shall be used under continuously dry conditions. The treated wood products are not permitted in areas exposed to the weather or wetting. Exposure to precipitation during shipping, storage or installation shall be avoided. If the treated wood products do become wet, they shall be replaced or permitted to dry to a maximum 19% moisture content (MC) for lumber and 15% MC for plywood prior to covering or enclosure by wall board or other construction materials.

D-Blaze treated wood products are not permitted to be used in contact with the ground. D-Blaze treated wood shall not be permitted in wet conditions of use or where preservatively treated wood is required.

5.0 IDENTIFICATION

All lumber and plywood treated with D-Blaze interior fire-retardant chemicals shall be identified by the grade mark of an approved quality assurance agency, and shall bear the Timber Products Inspection and Underwriters Laboratories Inc. names, the producing plant identification, flame-spread index or FR-S designation, and treatment date and the ICC-ES Legacy report number (see Figure 1.)

6.0 EVIDENCE SUBMITTED

6.1 Test reports for determination of surface-burning characteristics of D-Blaze treated lumber in accordance with ASTM E 84, Underwriters Laboratories Inc., File R10647, signed by James F. Smith, William G. Marshall, and Richard N. Walke:

6.1.1 Project 84NK19763, October 26, 1984, Alpine Fir, Douglas Fir, Lodgepole Pine, Southern Yellow Pine, Western Hemlock, White Fir, and White Spruce Lumber.

6.1.2 Letter Report Project 85NK4312, April 12, 1985, Southern Yellow Pine lumbars.

6.1.3 Project 85NK4312, May 3, 1985, Basswood and Red Oak lumbars.

6.2 Test reports for determination of surface-burning characteristics of D-Blaze treated plywood under ASTM E 84, Underwriters Laboratories Inc.:

6.2.1 File R10950, Project 84NK19763/R10647, October 29, 1984, Southern Yellow Pine and Douglas Fir Plywood, signed by James F. Smith and Richard N. Walke.

6.2.2 File R3926, Project 85SC18734, April 14, 1986, Lauan Plywood, signed by Hans F. Hansen and Garrett Tom.

6.3 Test reports on Hygroscopic properties of D-Blaze treated wood in accordance with ASTM D 3201, Truesdail Laboratories, Inc., August 31, 1995, signed by Tom J. Parsons:

6.3.1 Douglas Fir Lumber, Lab No. 62949-1.

6.3.2 Southern Yellow Pine Lumber, Lab No. 62949-3.

6.3.3 Southern Yellow Pine Plywood, Lab No. 62949-4.

6.3.4 Douglas Fir Plywood, Lab No. 62949-5.

6.4 Test report on evaluation of strength properties of D-Blaze lumber, Southern Pine, Douglas-Fir and White Spruce species at ambient temperatures up to 80° F, testing performed in accordance with NFPA (AFPA) January 1983 Protocol, Mississippi Forest Products Utilization Laboratory, Mississippi State University, August 2, 1985, signed by Duane E. Lyon, Kurt Bigbee, and William T. Nearn. Strength properties tested: ASTM D 143, static bending, compression parallel-to-grain, longitudinal shear, specific gravity; ASTM D 3500, tension parallel-to-grain.

6.5 Test report on evaluation of strength properties of D-Blaze treated Southern Pine lumber at elevated temperatures of 150° F and R.H. of 75%, Forest Products Laboratory at Clemson University, November 2, 1994, signed by Andy C. Lee, Ph.D. Strength properties tested: ASTM D 143, static bending, shear, compression, tension, toughness, and specific gravity.

6.6 Test report evaluation of static bending tests of D-Blaze treated N-Grade Southern Pine plywood at elevated temperatures of 170° F and R.H. of 75%, Forest Products Laboratory at Clemson University, October 15, 1993, signed by Andy C. Lee, Ph.D. Static bending testing performed: ASTM D 3043.

6.7 Engineering calculations evaluating temperature test data to produce plywood span tables, KCI Technologies, Inc. August 6, 1991 and August 12, 1991, signed and sealed by A. Rhett Whitlock, Ph.D., P.E.

6.8 Quality Assurance:

6.8.1 Quality Assurance for drying after treatment, Standard DB-90, Timber Products Inspection, Mark S. Hope, P.E. 4/7/97. Letter, July 28, 1997, signed by D. M. Dilbeck. Letter, September 26, 1997, Mark S. Hope, P.E.

6.8.2 Quality Assurance for treating, analysis of chemicals used, treating techniques and cycles, penetration and retention of the chemicals for each species., Underwriters Laboratories Inc.:

! Lumber, Treated, File R10647, Issued 07/30/87, Revised 03/13/02, signed by S. Joe Bhatia.

! Plywood, Treated, File R10950, Issued 07/30/87, Revised 06/21/02, signed by S. Joe Bhatia.

6.9 Engineering analysis of temperature and humidity test data to produce strength design factors for treated lumber, WDP Whitlock, Dalrymple & Associates, Inc., WDP Project No. 06-96005, February 14, 1996, signed and sealed by A. Rhett Whitlock, Ph.D., P.E.

6.10 Test report on corrosion resistance of fasteners in D-Blaze treated Southern Pine in accordance with AWWA Standard E 12-94, in contact with SAE 1010 Steel, 85-15 Red Brass and 2024-T3 Aluminum, galvanized steel, Forest Products Laboratory Forest & Wildlife Research Center, Mississippi State University, July 11, 1996, signed by Dr. Darrel D. Nicholas and Ms. Linda Sites.

7.0 CONDITIONS OF USE

The ICC-ES Subcommittee for the National Evaluation Service finds that Chemical Specialties, Inc., D-Blaze fire-retardant-treated lumber and plywood as described in this report comply with or are suitable alternatives to that specified in the 2000 *International Building Code*[®], the 2000 *International Residential Code*[®], and the 2002 *Accumulative Supplement to the International Codes*[™], the BOCA[®] *National Building Code*/1999, the 1999 *Standard Building Code*[®], the 1997 *Uniform Building Code*[™] and the 1998 *International One-and Two-Family Dwelling Code*[®] subject to the following conditions:

7.1 The D-Blaze treated lumber and plywood products are manufactured, identified and installed in accordance with this report.

7.2 All strength calculations are subject to the design factors or span ratings shown in Tables 1, 2, and 3.

7.3 The strength design factors and span ratings given in this report shall only be used for dimensional lumber and plywood of the species noted in this report.

7.4 The treated lumber is used only in areas where the ambient temperatures are less than 150° F (65 ° C), and treated plywood is used only in areas where the ambient temperatures are less than 170° F (76 ° C).

7.5 The strength design factors and plywood spans in Tables 1, 2 and 3 are applicable under elevated temperatures resulting from cyclic climatic conditions. This report is not applicable where the material is exposed to continuous elevated temperatures associated with industrial or other processes. Such applications require special consideration in design and are outside the scope of this evaluation.

7.6 Treated wood and plywood are not installed where exposed to precipitation, direct wetting, or regular condensation.

7.7 D-Blaze lumber shall not be ripped or milled as this will alter the surface burning characteristics and invalidate the flame spread classification. End cuts, holes, tongue and groove, bevel, scarf and lap joints are permitted in D-Blaze treated framing.

7.8 The products are treated at the D-Blaze licensed plant listed in this report as additional listees, with quality control inspections by Underwriters Laboratories Inc. and Timber Products Inspection, Inc.

7.9 This report is subject to periodic re-examination. For information on the current status of this report, contact the ICC-ES

TABLE 1
STRENGTH DESIGN FACTORS FOR D-BLAZE
FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED
LUMBER APPLICABLE AT TEMPERATURE UP TO 80° F (26.7° C)

Strength Design Factor	Southern Pine	Douglas Fir	Spruce
Compression Parallel and Perpendicular, F_c	0.93	0.91	0.94
Horizontal Shear	1.00	0.97	1.00
Tension Parallel	0.77	0.91	0.96
Bending: Modulus of Elasticity, E	0.88	0.96	0.97
Extreme Fiber Stress, F_b	0.85	0.87	0.90
Fasteners / Connectors	0.90	0.90	0.90

TABLE 2
STRENGTH DESIGN FACTORS FOR D-BLAZE
FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED
LUMBER APPLICABLE TO TEMPERATURE UP TO 150° F (65° C)

Strength Design Factor	Southern Pine
Compression Parallel and Perpendicular, F_c	0.85
Horizontal Shear	0.86
Tension Parallel	0.65
Bending: Modulus of Elasticity, E	0.89
Extreme Fiber Stress, F_b	0.79
Fasteners / Connectors	0.85

TABLE 3
D-BLAZE PLYWOOD SPAN RATINGS FOR SHEATHING
APPLICABLE AT TEMPERATURE UP TO 170° F (76° C) ^{1, 2, 3, 4, 5, 6}

APA Rating	Panel Thickness (Inch)	D-Blaze Rating
12/0	$\frac{5}{16}$	12/0
16/0	$\frac{5}{16}, \frac{3}{8}$	16/0
20/0	$\frac{5}{16}, \frac{3}{8}$	20/0
24/0	$\frac{3}{8}, \frac{7}{16}, \frac{1}{2}$	24/0
24/16	$\frac{7}{16}, \frac{1}{2}$	24/16
32/16	$\frac{15}{32}, \frac{1}{2}$	24/16
32/16	$\frac{5}{8}$	32/16 ⁷
40/20	$\frac{5}{8}, \frac{19}{32}$	32/20 ⁷
40/20	$\frac{3}{4}, \frac{7}{8}$	40/20 ⁷
48/24	$\frac{23}{32}, \frac{3}{4}$	40/24 ⁷
48/24	$\frac{7}{8}$	48/24

SI Units conversion: 1 inch = 25.4 mm

Notes to Table 3:

- In jurisdictions using the *Standard Building Code*[®] or the *Uniform Building Code*[™], gluelines shall be exterior and face plies shall be Douglas-fir, Southern Pine or Iauan.
- In jurisdictions using the *BOCA*[®] *National Building Code*, sheathing shall be exterior and face plies shall be Southern Pine, stress level S-2.
- Allowable uniformly distributed roof load at maximum span for rated sheathing is 30 psf (1426 Pa) for live loads plus 8.5 psf (407 Pa) dead load, and allowable distributed floor load at maximum span is 50 psf (2394 Pa) live load plus 5 psf (239 Pa) dead load, or 200 pounds (890 N) concentrated load in each case.
- Deflection criteria for D-Blaze treated plywood is 1/180 of span.
- The $\frac{5}{16}$ inch or $\frac{3}{8}$ inch thick (7.9 mm or 9.5 mm) panels are not permitted for roofing applications.
- Reduction factors provided are based on environmental temperature and relative humidity as expected from cyclic climatic conditions in the continental United States for roof sheathing applications. Other conditions, such as industrial processing, which would expose the sheathing treated with D-Blaze to elevated temperatures and/or humidity, are beyond the scope of this report.
- For roof sheathing applications in the geographic area located inside a line represented by Las Vegas, Yuma, Phoenix and Tucson, the designated roof sheathing spans shall be reduced by 2 inches (51 mm).

<p>(Plant Name) (Location)</p> <p>D-BLAZE® Interior Type A Fire Retardant In Accordance with AWPA C20 TP Monitored STD DB 90</p> <p>2000</p> <p>J F M A M J J A S O N D</p>	<p>NER</p>
	<p>UND. LAB INC.® Classified FR-S Lumber Control No. 14P8 R10647</p>

<p>(Plant Name) (Location)</p> <p>D-BLAZE® Interior Type A Fire Retardant In Accordance with AWPA C27 TP Monitored STD DB 90</p> <p>2000</p> <p>J F M A M J J A S O N D</p>	<p>NER See Above Report For Span Reductions Effecting 5/8" & 3/4"</p>
	<p>UND. LAB INC.® Classified FR-S Plywood Control No. 14P9 R10647</p>

FIGURE 1