Decay Resistance Study of Qora Cladding Panel, Untreated Southern Pine Control, Untreated Sweetgum Controls, and Treated Reference Control

Report #: WDL-2020-08b
ICC NTA Project No. AL060920-41

Arcitell, LLC
750 Edelweiss Dr NE
Sugarcreek, OH 44681

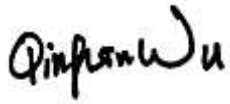
Submitted By:

Wood Durability Lab
Louisiana Forest Products Development Center
School of Renewable Natural Resources
LSU Agricultural Center
Baton Rouge, LA 70803
Tel. (225) 578-4131
Fax (225) 578-4251

3/24/21

TABLE OF CONTENTS

Report approved by:



Date: 3/24/21

Q.Wu, Ph.D.
Professor, Wood Science
Wood Durability Laboratory Director
Phone: (225) 578-8369
Fax: (225) 578-4251
E-mail: qwu@agcenter.lsu.edu

Report prepared by:

Date: 3/22/21

J.P. Curole
Research Associate
Wood Durability Technical Manager
Phone: (225) 578-4157
Fax: (225) 578-4251
E-mail: jcurole@agcenter.lsu.edu

BACKGROUND

The Wood Durability Laboratory (WDL) at the LSU AgCenter became an ISO 17025 accredited laboratory through the International Accreditation Services (IAS) accreditation system on March 1, 2008. Additional test standards were added by IAS to the WDL approved scope of services on July 24, 2008, November 20, 2009, May 31, 2012, January 24, 2014, March 31, 2016, July 26th, 2016, and June 6th, 2018 (Table 1). The lab has been operating under ISO 17025 Guidelines for over ten years. This report is compliant with ICC-ES AC85. This report has not been reviewed by a licensed professional engineer nor a third party skilled in the art. Samples and information sheets on traceability of samples were provided by the sponsor and verified at the time of sample creation. The results from this test only relate to the items tested.

Table 1. Current scope and WDL test methods accredited by IAS.

IAS Accreditation Number:	**TL-350**
Accredited Entity:	Wood Durability Laboratory
Address:	227 Renewable Natural Resources Louisiana State University Baton Rouge, Louisiana 70803
Contact Name:	Dr. Qinglin Wu, Director
Telephone:	(225) 578-8369
Effective Date of Scope of Accreditation:	April 28th, 2020
Accreditation Standard:	ISO/IEC Standard 17025:2017

Fields of Testing	**Accredited Test Methods**
Wood testing	ASTM Standards D143[2], D1037[2] (Compression Parallel to surface, section 12 excluded), D2395[8], D3043[5] (Methods A & D only), D4442[8], and D5456[5] (Test methods referenced in Annex A3 & A4); AC257[3] test methods referenced in Section 4.0, excluding 4.3.1.1, 4.3.1.2, 4.3.1.4, & 4.3.2.2)
Wood preservatives	ASTM Standards D2481[3], D3273[5], D3345[1], D4442[8], D4445[3], & D5516[4] AWPA Standards E1[1], E5[3], E7[1], E9[3], E10[1], E11[1], E12[1], E16[3], E18[3], E20[6], E21[4], E22[2], E23[2], E24[1], E26[4] and E29[5] WDMA Standards TM-1[1] and TM-2[1] WDL-SOP-25[6] – Field Evaluation of Termiticide against Subterranean Termites AC380[7] test methods referenced in Sections 3, 4.1, 4.2 and 4.3, excluding 4.4.1 through 4.4.9)

Approved: [1]March 1, 2008, [2]July 24, 2008, [3]November 20, 2009, [4]May 31, 2012, [5]January 24, 2014, [6]March 31, 2016, [7]July 26, 2016, [8]June 6, 2018, & [9]April 28, 2020

OBJECTIVES

The objective of this study was to evaluate one Qora Cladding Panel, untreated southern pine control, sweetgum control, and treated reference control for prevention of decay attack in an ASTM D1413 soil-block culture test.

MATERIALS

Representative material was sampled by ICC NTA personnel on September 17, 2020 at the client's manufacturing facility located in Sugarcreek, Ohio. This report describes testing conducted for ICC NTA, LLC on behalf of Arcitell, LLC.

Table 2. Qora Cladding Panel plus control samples.

Project: WDL-2020-08b Cladding		
Treatment Groups	**Brown Rot Fungus**	**White Rot Fungus**
Cladding Panel	*Gloeophyllum trabeum* (GT) & *Postia placenta* (PP)	*Trametes versicolor* (TV) & *Irpex lacteus* (IL)
Untreated pine		
Untreated Sweetgum		
ACQ Treated Pine		

ID	**Controls**	**Fungus**
1-5	Cladding	GT
6-10	Cladding	PP
1-5	Pine	GT
6-10	Pine	PP
21-25	ACQ	GT
26-30	ACQ	PP

ID	**Controls**	**Fungus**
11-15	Cladding	TV
16-20	Cladding	IL
11-15	Sweetgum	TV
16-20	Sweetgum	IL
31-35	ACQ	TV
36-40	ACQ	IL

METHODS

The test was performed in accordance with the American Society for Testing and Materials Standard Test Method for Wood Preservatives by Laboratory Soil-block Cultures (ASTM D1413). This test is used to determine the minimum amount of preservative to prevent decay growth under optimum laboratory conditions. This test was started on 12/7/20 and was completed on 3/1/21. The experiment consisted of 20 Qora Cladding Panel samples, 10 southern pine sapwood untreated controls, 10 sweetgum controls, and 20 treated reference controls (Table 2). All samples were precisely machined into 19mm test cubes or product thickness for the Qora Cladding Panel samples.

Decay fungi were obtained from the USDA FPL, Madison, Wisconsin, consisting of *Gloeophyllum trabeum, Postia placenta, Trametes versicolor,* and *Irpex lacteus*. The decay fungi were grown on agar media for two weeks prior to being placed into the testing bottles (on the top of each feeder strip). After a two-week growing period in the testing bottles (allowing the fungi to grow on the feeder strip); test samples were placed on top of the feeder strips. Substrates used for feeder strips were southern pine for brown rot decay and sweetgum for white rot decay. Five samples were tested per group per fungi.

RESULTS

Table 3 summarizes the brown rot fungi data and Table 4 summarizes the white rot fungi data for weight loss. Figure 1 shows plots of the individual groups against the brown rot decay fungi. Figure 2 shows plots of the individual groups against the white rot decay fungi.

1. *Gloeophyllum trabeum* – The pine controls had the largest weight loss at 60.24%. The cladding panel and ACQ groups had low sample weight loss and the data were not significantly different from one another at α=0.05.

2. *Postia placenta* – The pine controls had the largest weight loss at 63.46%. The ACQ group had significant weight loss as well at 20.42%, which is common for this fungi verses ACQ. The cladding panel had the lowest weight loss and all three groups were significantly different from one another at α=0.05.

3. *Trametes versicolor* – The sweetgum controls had the largest weight loss at 33.40%. The cladding panel and ACQ groups had low sample weight loss and the data were not significantly different from one another at α=0.05.

4. *Irpex lacteus* - The sweetgum controls had the largest weight loss at 37.56%. The cladding panel and ACQ groups had low sample weight loss and the data were not significantly different from one another at α=0.05.

Thus, decay fungi caused similar wood damage to the cladding panel samples in comparison with data from ACQ treated wood, except for *Postia placenta*, which had a much higher attack rate on ACQ.

CONCLUSIONS

This test demonstrated that the cladding panel showed good resistance to the decay fungi compared to the untreated pine controls. When compared to ACQ treated wood, except for *Postia placenta*, the cladding panels had roughly the same low percentage weight loss values. Thus, the *Postia placenta* fungi caused more wood damage to the ACQ samples.

The ACQ samples performed as expected and had similar weight losses as in previous tests. The untreated control wood showed high sample weight loss; therefore, the fungi were considered to be of high vigor and the data are valid.

REFERENCES CITED

American Society for Testing and Materials Standard Test Method for Wood Preservatives by Laboratory Soil-block Cultures (ASTM D1413).

American Wood Protection Association (AWPA). 2020. Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures (E10-16). 2020 book of standards. Birmingham, AL.

SPSS 25 for Windows. 2021. Chicago, IL.

Steel, R.G.D. and J.H. Torrie. 1980. Principle and procedures of statistics – A biometrical approach. 2nd edition. McGraw Hill. New York. 633 p.

Table 3. Summary data for weight loss % for brown rot fungi.

Project: WDL-2020-08b Cladding			
Brown Rot Weight Loss Stats			
Group ID	**BR Decay**	**Weight Loss %**	**LSD Group**
Cladding	*Gloeophyllum trabeum*	3.94%	**A**
ACQ Pine		4.26%	**A**
UT pine		60.24%	**B**

Group ID	BR Decay	Weight Loss %	LSD Group
Cladding	*Postia placenta*	4.48%	**A**
ACQ Pine		20.42%	**B**
UT pine		63.46%	**C**

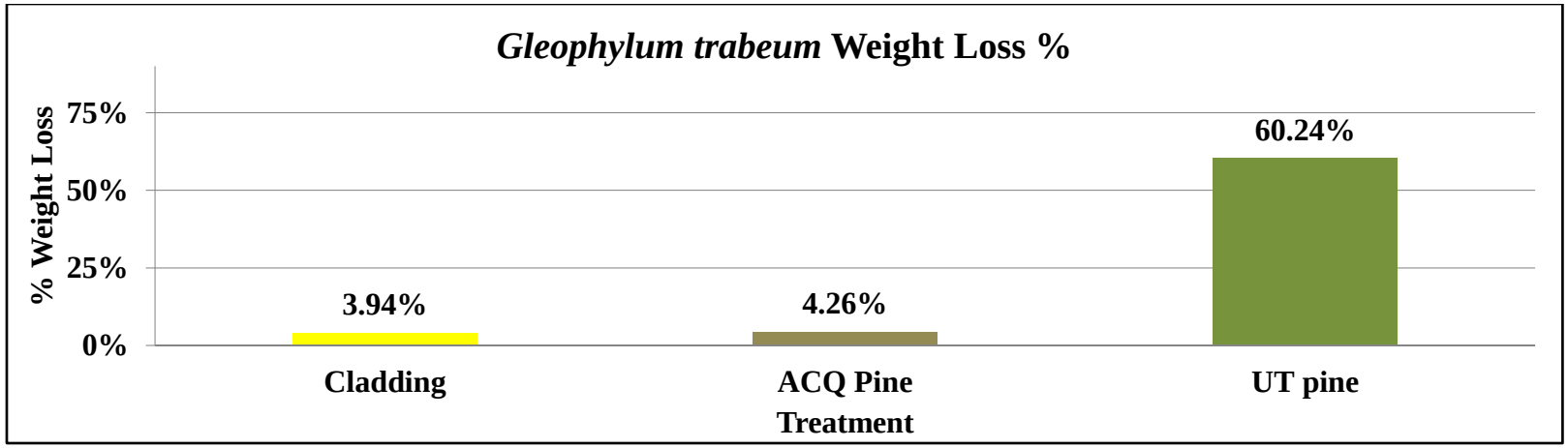
*Weight loss values sharing a capitol LSD letter are not significantly different at α=0.05.

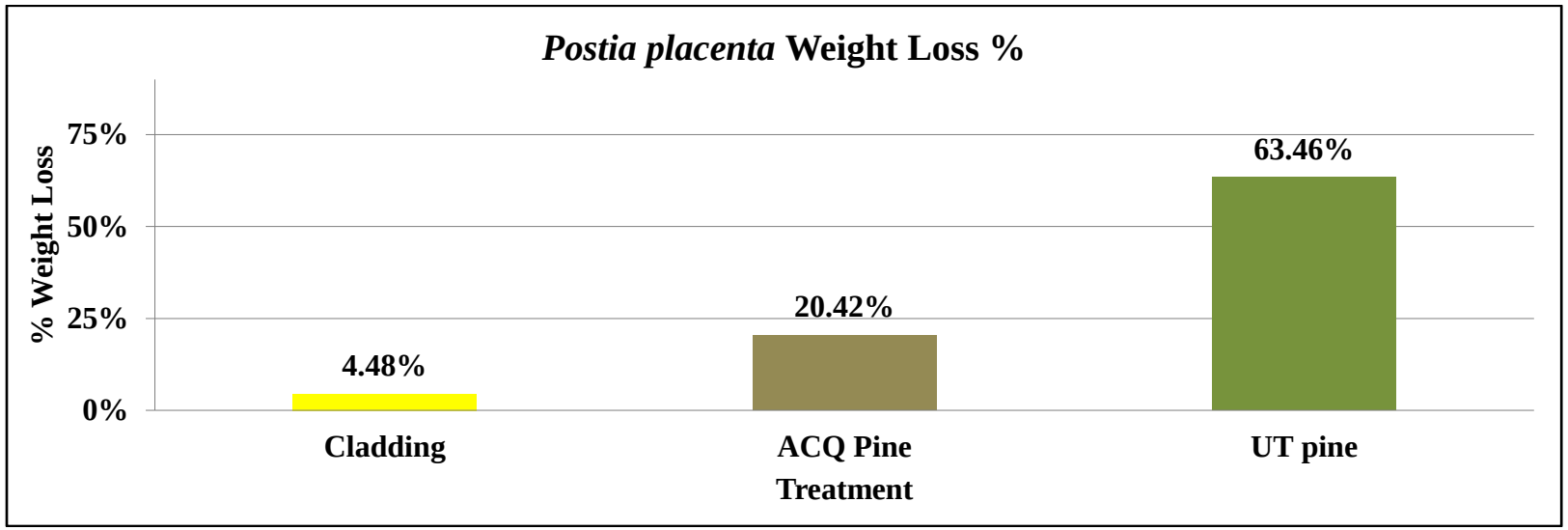
Table 4. Summary data for weight loss % for white rot fungi.

Project: WDL-2020-08b Cladding			
White Rot Weight Loss Stats			
Group ID	**WR Decay**	**Weight Loss %**	**LSD Group**
Cladding	*Trametes versicolor*	4.66%	**A**
ACQ Pine		5.13%	**A**
UT Sweetgum		33.40%	**B**

Group ID	WR Decay	Weight Loss %	LSD Group
ACQ Pine	*Irpex lacteus*	4.25%	**A**
Cladding		4.83%	**A**
UT Sweetgum		37.56%	**B**

*Weight loss values sharing a capitol LSD letter are not significantly different at α=0.05.





Figures 1. Graphs of means for percent weight loss when tested against brown rot fungi for 16 weeks.

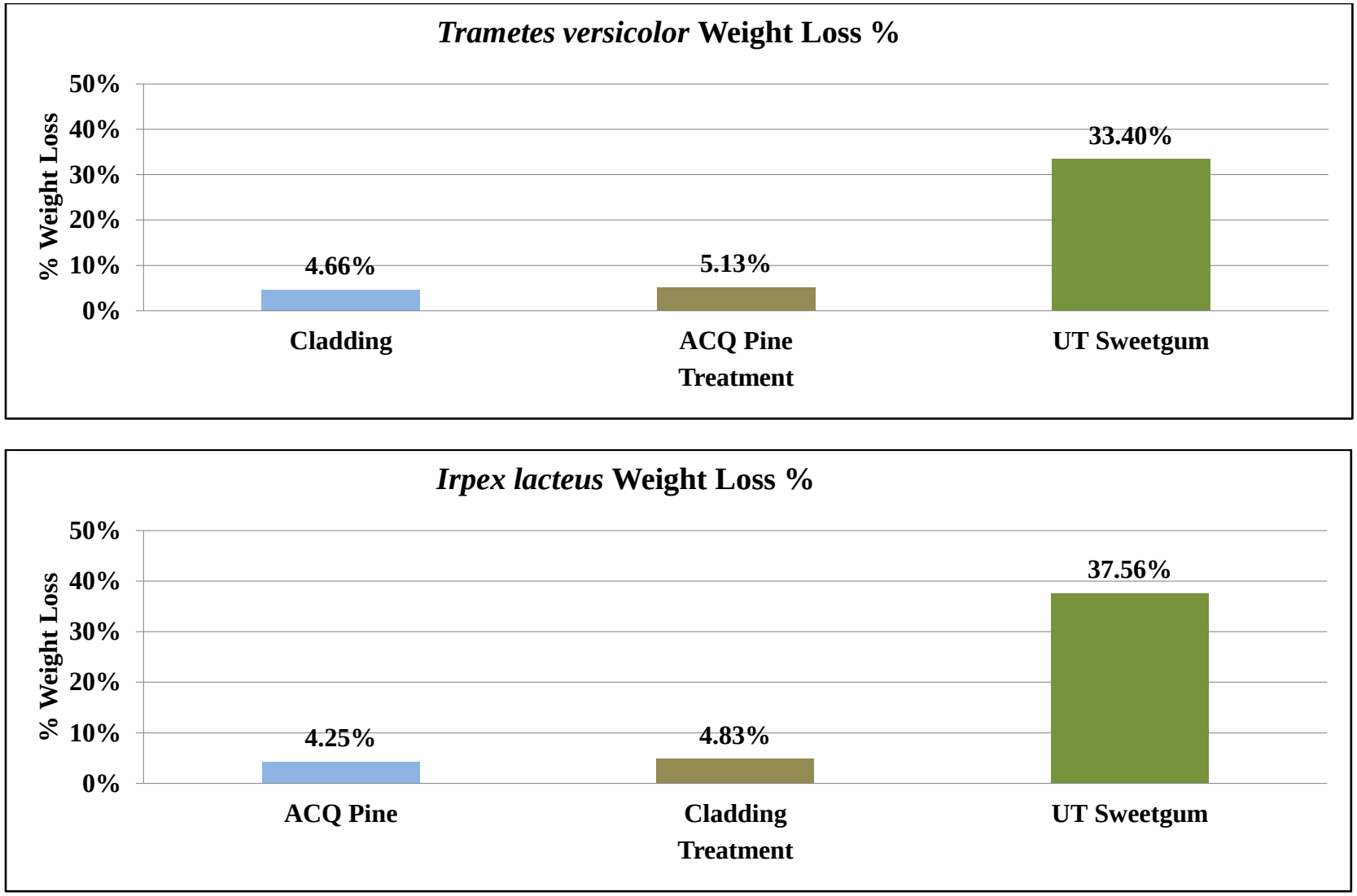


Figure 2. Graph of means for percent weight loss when tested against white rot fungi for 16 weeks.

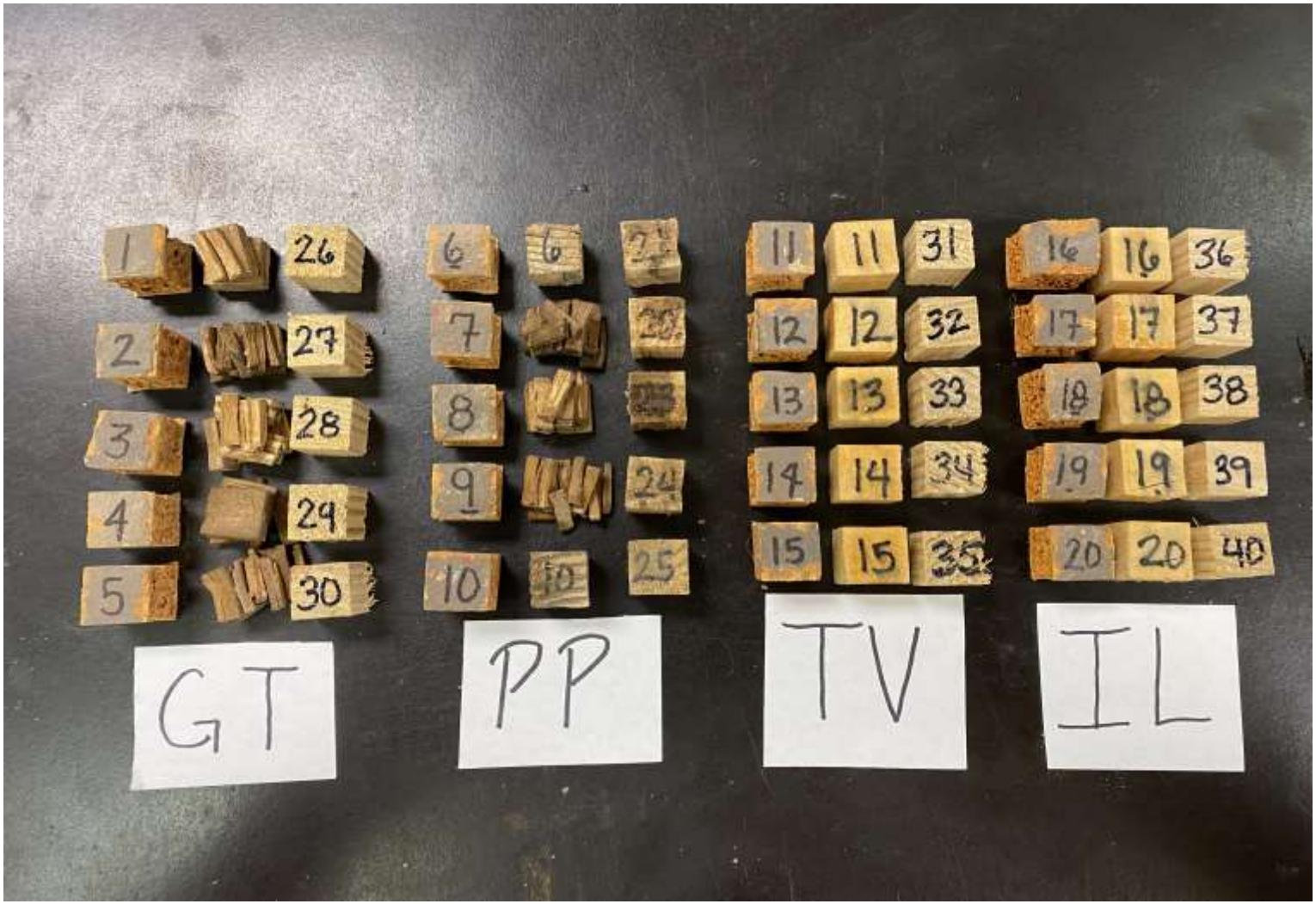


Figure 1. Samples after decay exposure. Each group left to right contain Qora cladding, untreated controls, and reference controls.

INTERNATIONAL ACCREDITATION SERVICE®

CERTIFICATE OF ACCREDITATION

This is to attest that

WOOD DURABILITY LABORATORY
227 RENEWABLE NATURAL RESOURCES, LOUISIANA STATE UNIVERSITY
BATON ROUGE, LOUISIANA 70803, U.S.A.

Testing Laboratory TL-350

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date July 9, 2020

IAS ACCREDITED

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

WOOD DURABILITY LABORATORY

Contact Name Dr. Qinglin Wu **Contact Phone** +225 578-8369

Accredited to ISO/IEC 17025:2017 *Effective Date July 9, 2020*

Physical	
ASTM D143	Standard test methods for small clear specimens of timber
ASTM D1037	Standard test methods for evaluating properties of wood-base fiber and particle panel materials (compression parallel to surface, section 12, excluded)
ASTM D2395	Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials
ASTM D2481	Standard test method for accelerated evaluation of wood preservatives for marine services by means of small size specimens
ASTM D3043	Standard test methods for structural panels in flexure (methods A and D only)
ASTM D3273	Standard test method for resistance to growth of mold on the surface of interior coatings in an environmental chamber
ASTM D3345	Standard test method for laboratory evaluation of wood and other cellulosic materials for resistance to termites
ASTM D4442	Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials
ASTM D4445	Standard test method for fungicides for controlling sapstain and mold on unseasoned lumber (laboratory method)
ASTM D5456	Standard specification for evaluation of structural composite lumber products (test methods referenced in annex A3 and A4 only)
ASTM D5516	Standard test method for evaluating the flexural properties of fire-retardant treated softwood plywood exposed to elevated temperatures
AWPA E1	Laboratory methods for evaluating the termite resistance of wood-based materials: choice and no-choice tests
AWPA E5	Standard test method for evaluation of wood preservatives to be used in marine applications (UC5A, UC5B, UC5C); panel and block tests
AWPA E7	Standard field test for evaluation of wood preservatives to be used in ground contact (UC4A, UC4B, UC4C); stake test
AWPA E9	Standard field test for the evaluation of wood preservatives to be used above ground (UC3A and UC3B); L-joint test

TL-350
WOOD DURABILITY
LABORATORY

ilac-MRA IAS INTERNATIONAL ACCREDITATION SERVICE

Page 2 of 3

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

AWPA E10	Laboratory method for evaluating the decay resistance of wood-based materials against pure basidiomycete cultures: soil/block test
AWPA E11	Standard method for accelerated evaluation of preservative leaching
AWPA E12	Standard method of determining corrosion of metal in contact with treated wood
AWPA E16	Standard field test for evaluation of wood preservatives to be used above ground (UC3B); horizontal lap-joint test
AWPA E18	Standard field test for evaluation of wood preservatives to be used above ground (UC3B); ground proximity decay test
AWPA E20	Standard method of determining the depletion of wood preservatives in soil contact
AWPA E21	Standard field test method for the evaluation of wood preservatives to be used for interior applications (UC1 and UC2); full-size commodity termite test
AWPA E22	Laboratory method for rapidly evaluating the decay resistance of wood-based materials against pure basidiomycete cultures using compression strength: soil/water test
AWPA E23	Laboratory method for rapidly evaluating the decay resistance of wood-based materials in ground contact using static bending: soil jar test
AWPA E24	Laboratory method for evaluating the mold resistance of wood-based materials: mold chamber test
AWPA E26	Standard field test for evaluation of wood preservatives intended for interior applications (UC1 and UC2): ground proximity termite test
AWPA E29	Antisapstain field test method for green lumber
ICC ES AC257	Corrosion-resistant fasteners and evaluation of corrosion effects of wood treatment chemicals (test methods referenced in section 4.0, excluding sections 4.3.1.1, 4.3.1.2, 4.3.1.4 and 4.3.2.2)
ICC ES AC380	Termite physical barrier systems (test methods referenced in sections 3, 4.1, 4.2 and 4.3, excluding 4.4.1 through 4.4.9)
WDL-SOP-25	Field evaluation of termiticide against subterranean termites
WDMA T.M. 1	Soil block test method
WDMA T.M. 2	Swellometer test method

AWPA: American Wood Preservers' Association

WDMA: Window and Door Manufacturer Association

TL-350
WOOD DURABILITY
LABORATORY

ilac-MRA IAS INTERNATIONAL ACCREDITATION SERVICE

Page 3 of 3

End of report