



CMI ProdCert Scheme Technical Assessment

issued to

**Phuc Khanh Construction Investment and
Trading Joint Stock Company**

for

Formwork Plywood

AS 6669-2016

PC10108

This document has been produced by CMI Certification Pty Ltd (CMI).

For information on the matters discussed in the document, contact us on +61 7 5445 2199 or e-mail office@cmicert.com.au.

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Contents

Executive Summary	4
Non-Conformities	4
Applicant Details	5
Scope of Certification	5
Desktop Assessment	5
Marking Proposal	5
Packaging Proposal	5
Approved Test Plans	6
Type Test Plan	6
Batch Release Test Regime	6
Design Appraisal	6
Technical Document Audit	7
Document 1	7
Supplied Installation Manual/USER Guide/Instructions	27
Technical Summary	27
Summary of Findings	35
Opportunities For Improvement	35
Non-Conformities Raised	35
Recommendation	35
Next Action	35
Completed By	35
Conditions	36

EXECUTIVE SUMMARY

CMI Certification Pty Ltd has been engaged by Phuc Khanh Construction Investment and Trading Joint Stock Company to evaluate their Formwork Plywood for compliance against the CMI ProdCert Scheme Rules.

The Technical Assessment is completed with all the supporting information that has been provided by the Client in line with their Product, the CMI ProdCert Scheme Rules and the specific requirements of CMI, including all relevant declarations.

This Assessment may address the following as required:

- a. Marking & Scope of Use Proposal;
- b. Batch Testing;
- c. Type Test Plan;
- d. Product Design, components, specifications, drawings etc;
- e. Testing conducted;
- f. User Guide(s)/Packaging; and
- g. Any other evidence supplied as required.

Where a Family or Range of Products is to be certified, the above requirements will incorporate a review of the Range/Family.

Onsite audit(s) including any findings are documented separate to this report. Refer to the appropriate audit report.

This Assessment is to be completed by person(s), deemed by CMI, to be competent to perform this function of the Scheme Rules. CMI have determined this criteria in accordance with the requirements of ISO/IEC 17065 Section 6.1.2.1 (a) which has been recorded in CMI's Competency Matrix.

NON-CONFORMITIES

Non-Conformity with any aspects of certification shall be dealt with formally and shall be the subject of a Corrective Action Request (CAR) or within the report if appropriate, typically within desktop assessments undertaken.

CMI shall notify the Client, requiring the appropriate action to be taken from the following options:

Critical Non-Conformity – where the potential impact warrants immediate corrective action: A N/C is to be raised requiring immediate corrective action to be taken. Further products shall not be produced until the N/C is closed. Critical Non-Conformity shall require verification of effective implementation of corrective action. If the N/C is not closed out by the agreed date, CMI shall suspend or withdraw the Certificate & License number.

Major Non-Conformity – where the potential impact is likely to compromise compliance if no remedial action is taken to correct the Non-Conformity: A N/C is to be raised and a close out timeframe of 7 days. Major Non-Conformity shall require verification of effective implementation of corrective action. If the N/C is not closed out by the agreed date, CMI shall determine that the Non-Conformity is now a Critical Non-Conformity and take appropriate action.

Minor Non-Conformity – where the potential impact of the Non-Conformity is not likely to compromise compliance: A N/C is to be raised and a suitable closeout date agreed with the Client. The close out date shall reflect the potential impact of the Non-Conformity and its ease of rectification. Close out shall be dependent on the Non-Conformity however; shall normally be at the next surveillance evaluation.

If a Minor CAR is not closed out by the agreed date, CMI shall review the reasons for non-closure with the Client and depending on the nature of the Non-Conformity and its potential to affect compliance, shall take one of the following actions:

- a. determine that a Minor Non-Conformity still exists, cancel the existing N/C and raise a new N/C with a new close out date agreed with the Client, reporting the action in the evaluation report; or
- b. determine that the Non-Conformity is now a Major or Critical Non-Conformity and raise a N/C with a close out date as required for Major or Critical Non-Conformity.

Certification shall not be issued where there are open Major or Critical N/C(s).

APPLICANT DETAILS

Applicant/Certificate Holder:	Phuc Khanh Construction Investment and Trading Joint Stock Company
Reason for Technical Assessment:	☒ Initial Certification ☐ Certificate Change ☐ Surveillance ☐ Renewal

SCOPE OF CERTIFICATION

Product/Model Name(s): For large range of Products refer Appendix 1.	Phuc Khanh 17mm F17 grade plywood
Description of products:	Plywood
Intended Use:	Formwork use
Applicable Specification/Standard:	AS 6669:2016

DESKTOP ASSESSMENT

Any additional requirements resultant of this assessment are documented in the Technical Summary.

MARKING PROPOSAL

Has an acceptable 'Marking Proposal' been submitted & approved?

☒ Yes ☐ No

Provide Details/Evidence:

Printed on the finished board:

Phuc Khanh FORMWORK PLYWOOD_ AS 6669:2016_Made in Vietnam_Class2_A-Bond_E0_F17_CC_CMI_PC10108
I-245.8 Z-28.1/I-184.9 Z-23.7

PACKAGING PROPOSAL

Has an acceptable 'Packaging Proposal' been submitted & approved?

☒ Yes ☐ No

Provide Details/Evidence:

Stick it on the package:

AS 6669:2016 Class 2 A-Bond E0 <u>F17 Panel</u> grade: CC Formwork Plywood Made in Vietnam $I_{//} = 245.8\text{mm}^4/\text{mm}$ $Z_{//} = 28.1\text{mm}^3/\text{mm}$ $I_{\perp} = 184.9\text{mm}^4/\text{mm}$ $Z_{\perp} = 23.7\text{mm}^3/\text{mm}$	 PC10108 Phuc Khanh Construction Investment and Trading Joint Stock Company
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The above documents shall be retained in the Certification File.

APPROVED TEST PLANS

The following Test Plans have been either Reviewed & Approved or Developed by CMI for immediate implementation. The below shall be reviewed at the relevant Surveillance and/or Re-Certification Audits. Refer Scheme of Testing & Inspection Agreement (STIA) dated 09/08/2024.

Type Test Plan

- ☐ As detailed in the standard.
☒ CMI developed STIA.

Batch Release Test Regime

- ☐ As detailed in the standard.
☒ CMI developed STIA.

DESIGN APPRAISAL

Does the design of the product comply with the specific requirements of the specification/Standard?

- ☒ Yes ☐ No

AS 6669:2016 Plywood - Formwork

Brand	Model	Description
Phuc Khanh	F17	Formwork Plywood-1200mm Wide × 1800mm to 2400mm Long × 17mm Thickness- Eucalyptus & Acacia-Class 2, CC, A Bond, E ₀ F17 - 17(I 245.8 - Z 28.1 / I 184.9 - Z 23.7) Parallel: E 14419 MPa; f_b' 66.0 MPa; f_s' 7.3 MPa; Perpendicular: E 19787 MPa; f_b' 103.1 MPa; f_s' 7.1 MPa;

TECHNICAL DOCUMENT AUDIT

The below table provides a list of all reports provided to CMI for the purpose of verifying the product compliance with the applicable Standard(s)/Specification(s). Refer to CMI's Acceptance Criteria 'CMI-AC-ESC', for further details on the criteria for Evidence in support of Certifications.

If there is not enough evidence to support the claim CMI needs to clearly state what the client needs to provide to satisfy the claim. This is to be stated in the Report Details & comments section.

Document 1.

File Name	HJ-RD-24154-Type Test for Phuc Khanh Construction Investment and Trading Joint Stock Company-20240830-正式版				
Report Title	Phuc Khanh Type test Formwork Plywood AS6669	Standard(s) referenced	AS 6669:2016	Standard Current?	☒ Yes ☐ No
Issuing Body/Author	Shanghai Hongjun Science & Technology Co. Ltd	Issue Date:	30/08/2024	Expiry Date:	-
Dated within 5 Years	☒ Yes ☐ No	Report is representative of the product	☒ Yes ☐ No		
CMI Assessment					



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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

Test Report

Applicant	Phuc Khanh Construction Investment and Trading Joint Stock Company
Test Category	Type Test
Sample Type	Formwork Plywood
Test Standard	AS 6669

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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024



Precautions

1. This test report is invalid without authorized approved signature, signature of verifier and approver.
2. This test report is invalid if being supplemented, deleted or altered.
3. Unless otherwise stated, the observations and test results in this report are relevant only to the sample(s) tested.
4. Objections to the test report must be submitted to Hongjun within 15 days of report received date. This report does not imply that the material, product, or service is or have ever been under Hongjun or ICTT certification program.
5. The test applicant is responsible for authenticity of sample information which not subject to verification of Hongjun.
6. The applicable decision rules of this test are: IEC Guide 115:2007 Procedure 2 - Accuracy method, do not subject to measurement uncertainty.

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Report No.: HF-RD-24154 Issue Date: Aug. 30th, 2024



ACCREDITED
I1-458

1. Sample Description^{1,2}

Samples for type test in this report were sampled and shipped to test laboratory by the applicant on Jun. 25th, 2024, packed well and kept in good conditions. Samples were identified as Formwork Plywood by the applicant. Samples are non-standard construction formwork plywood with 17mm nominal thickness. Wood species of face and back veneers is Acacia, while core veneers is Eucalyptus. The assembly construction and identification code are 1.06/1.56/1.80/1.56/1.80/1.56/1.80/1.56/1.06mm and 17 - (245.8, 28.1/184.9, 23.7), respectively. The surface quality of the formwork plywood is Class 2. The dimension specification and quantity of samples obtained are shown in the table below:

Sample Information			
Test Item		Specimen Specification (Length×Width×Thickness, mm)	Specimen Quantity
Dimensions and Shape		2400×1200×17	10
Edge Finish			
Veneer Qualities			
Surface Finish			
Moisture Content		100×100×17	10
Density			
Formaldehyde Emission Class		150×50×17	100
Joints in Veneer		2400×1200×17	10
Bond Quality	Dry Condition	150×65×17	30
	Steam Condition	150×65×17	30
Requirements for Overlays	Adhesion Test	50×50×17	6
	Bond Quality and Bond Durability	150×65×17	6
	Overlay Cure Test	100×100×17	6
	Water Permeability	150×150×17	6
Bending Strength and Modulus of Elasticity	Parallel to Face Grain	885×300×17	30
	Perpendicular to Face Grain	885×300×17	30
Panel Shear Strength	Parallel to Face Grain	200×85×17	30
	Perpendicular to Face Grain	200×85×17	30

- Notes:
- 1. Sample information is provided by the applicant, and test items are specified by the applicant.
 - 2. The veneer thickness in assembly construction, provided by the applicant, are the actual values used to calculate the section properties.

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2. Adhesive Information³

The adhesive used is phenolic formaldehyde resin. Adhesive information is listed in the table below:

Adhesive Name	Model No.	Manufacturer
Phenolic Glue	14P578	Aica Dong Nai Co., Ltd

Notes:

3. Adhesive information is provided by the applicant.

3. Referenced Standards

- ◆ AS/NZS 2098.1:2006 Methods of test for veneer and plywood-Method 1: Moisture content of veneer and plywood
- ◆ AS/NZS 2098.2:2012 Methods of test for veneer and plywood-Method 2: Bond quality of plywood (chisel test)
- ◆ AS/NZS 2098.4:2006 Methods of test for veneer and plywood Method 4: Measurement of dimensions and shape for sheets of veneer and plywood
- ◆ AS/NZS 2098.7:2006 Methods of test for veneer and plywood Method 7: Density of veneer and plywood
- ◆ AS/NZS 2098.11:2005 Method 11: Determination of formaldehyde emissions for plywood
- ◆ AS/NZS 2754.1:2016 Adhesives for timber and timber products-Part 1: Adhesives for manufacture of plywood and laminated veneer lumber (LVL)
- ◆ AS/NZS 2269.0:2012 Plywood—Structural Part 0: Specifications
- ◆ AS/NZS 2269.1:2012 Plywood—Structural Part 1: Determination of structural properties—Test methods
- ◆ AS/NZS 2269.2:2007 Plywood—Structural Part 2: Determination of structural properties—Evaluation methods
- ◆ AS 6669:2016 Plywood—Formwork
- ◆ AS/NZS 4063.2:2010 Characterization of structural timber Part 2: Determination of characteristic values

Unless specified, all test standards in this report are the version cited by AS 6669.

4. Test Description & Environment

Test procedure complied with corresponding test method requirement, which are listed in section 3 of this report. The test started on June 28th, 2024 and completed on July 30th, 2024.

During the test, the relative humidity and temperature of test environment were $(65 \pm 10) \%$ and $(20 \pm 5) ^\circ\text{C}$, respectively.

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5. Test Results

Test Item		Clause	Units	Results ⁺	Standard Requirements	Verification Results	
Dimensions and Shape	Thickness	1.6.1	mm	17.46	17±0.88	Pass	
	Length	1.6.1	mm	2400.7	2400±1.5	Pass	
	Width	1.6.1	mm	1201.3	1200±1.5	Pass	
	Squareness	Mean	1.6.2	mm	0.3	The difference in length of the two diagonals of the sheet shall not exceed 3 mm.	Pass
		Maximum			1.0		
		Minimum			0.0		
	Straightness of Edges	Mean	1.6.2	mm	0.6	Any edge of a sheet shall not deviate from a straight line by more than 1 mm.	Pass
		Maximum			0.9		
		Minimum			0.4		
	Flatness	Mean	1.6.2	mm	3.4	For an unloaded sheet, ≤30mm (when the sheet is loaded at 15kg, the loading area of the sheet shall touch the flat horizontal surface vertically)	Pass
		Maximum			4.3		
		Minimum			2.6		
Moisture Content		1.7	%	12.2	6-15	Pass	
Density (12%MC)		-	kg/m ³	717	N.A	N.A	
Edge Finish		1.8	-	No missing veneer, clean cut and square to the face	No missing veneer permitted, clean cut and square to the face. Sawing defects within 5 mm of the edge shall be permitted.	Pass	
Formaldehyde Emission Class		1.11	mg/L	0.18 0.17 0.18 0.17 0.19 0.16 0.17 0.17 0.17	The formaldehyde emissions from plywood shall be in accordance with the limits specified in Table 1.1 of AS 6669, for emission classes Super E ₀ to E ₁ .	Super E ₀ (Average 0.3, 0.4 max.)	
Branding/markings		1.12	-	Legibly	Branding legibility and content	Pass	

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Test Item			Clause	Units	Results ⁴	Standard Requirements	Verification Results
Veneer Quality	Face		2.1 & 2.3	-	Quality C	Quality D or better	Pass
	Back			-	Quality C	Quality D or better	Pass
Surface Finish			3.2	-	Class 2	Class Surface Finish	Pass
Joints in Veneer	Slope of Scarf joint		4.1	-	0.08	≤1/6	Pass
Bond Quality	Dry Condition	Mean	4.3	-	7.1	Bond quality in any single glue line of not less than 2 and an average of not less than 5	Pass
		Minimum		-	6.0		
	Steam Condition	Mean		-	6.6		
		Minimum		-	4.0		
Requirements for Overlays	Adhesive Test		4.5	MPa	1.43	≥1.0	Pass
	Bond Quality and Bond Durability	Bond Quality	4.5	-	8.3	≥5	Pass
		Delamination or Blistering		-	None	No severe delamination or blistering	
	Overlay Cure Test		4.5	-	None	The sodium hydroxide solution shall show no pink discolouration and the overlay shall not delaminate, deteriorate or discolour after 6 h	Pass
	Water Permeability		4.5	g/m ² /h	1.3	≤10	Pass

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Issue Date: Aug. 30th, 2024

Application of Stress Grades and Mechanical Properties to Formwork Plywood Panels						Moisture Content
Test Item	Orientation	Clause	Mean Value (MPa)	Characteristic Values ^{4,5,6} (MPa)	Coefficient of Variation (%)	Mean Value (%)
Modulus of Elasticity	Parallel	5.2	14564	14419	7.8	12.8
	Perpendicular		20066	19787	11.4	12.3
Bending Strength	Parallel	5.2	84.5	66.0	12.8	12.8
	Perpendicular		117.5	103.1	6.9	12.3
Panel Shear Strength	Parallel	5.2	7.8	7.3	3.9	12.0
	Perpendicular		7.6	7.1	3.7	11.5
Second Moment of Area	Parallel	4.4.3	F: 245.8 mm ⁴ /mm			
	Perpendicular		F: 184.9 mm ⁴ /mm			
Section Modulus	Parallel	4.4.3	Z: 28.1 mm ³ /mm			
	Perpendicular		Z: 23.7 mm ³ /mm			

Notes:

- For detailed test data, please reference Appendix I of test report.
- The characteristic values for strength, were the 5th percentile values estimated with 75% confidence, which was determined in accordance with AS/NZS 2269.2.
- The characteristic value for modulus of elasticity was the mean or adjusted mean value, estimated with 75% confidence, which was determined in accordance with AS/NZS 4063.2.
- The F-grades shall be assigned according to Table 5.1 of AS 6669, which is shown below.

**TABLE 5.1
FORMWORK PLYWOOD - CHARACTERISTIC PROPERTIES FOR F-GRADES**

F-grade	Characteristic strength, MPa		Short duration average modulus of elasticity, MPa (E)
	Bending (f_b)	Panel Shear (f_v)	
F34	90	6.0	21 500
F27	70	6.0	18 500
F22	60	5.5	16 000
F17	45	5.1	14 000
F14	36	4.8	12 000
F11	31	4.5	10 500
F8	25	4.2	9 100
F7	20	3.9	7 900

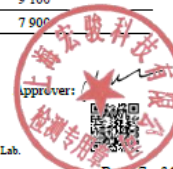
Reporter: *Xing Xin*

Verifier: *Lina Deng*

Approver: *[Signature]*

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Appendix I - Test Data

1. Dimensions and Shape

Length, Width, Thickness

No.	Length, mm			Width, mm			Thickness, mm			
	Point 1	Point 2	Point 3	Point 1	Point 2	Point 3	Point 1	Point 2	Point 3	Point 4
1	2400	2402	2401	1200	1202	1200	17.38	17.24	17.56	17.60
2	2400	2402	2400	1200	1204	1202	17.70	17.42	17.64	17.50
3	2400	2401	2400	1202	1202	1202	17.48	17.21	17.46	17.51
4	2400	2402	2402	1202	1200	1200	17.56	17.49	17.60	17.71
5	2400	2401	2400	1204	1202	1202	17.34	17.64	17.48	17.63
6	2400	2401	2400	1200	1200	1200	17.51	17.25	17.64	17.23
7	2400	2402	2401	1200	1202	1202	17.39	17.51	17.42	17.25
8	2400	2400	2402	1204	1200	1202	17.26	17.68	17.65	17.42
9	2400	2401	2400	1200	1200	1200	17.30	17.48	17.27	17.39
10	2400	2402	2400	1202	1202	1202	17.42	17.36	17.39	17.43

Shape

No.	Length of Diagonals, mm		Straightness of Edges, mm		Flatness, mm	
	1	2	Edge 1	Edge 2	Unloaded	Loaded
1	2683	2683	0.48	0.70	3.3	0
2	2685	2684	0.47	0.57	2.9	0
3	2684	2684	0.72	0.55	4.2	0
4	2684	2684	0.85	0.68	3.0	0
5	2684	2683	0.59	0.49	2.6	0
6	2683	2683	0.81	0.44	3.0	0
7	2684	2683	0.52	0.81	4.3	0
8	2684	2684	0.75	0.89	2.6	0
9	2684	2684	0.35	0.48	3.8	0
10	2683	2683	0.44	0.66	3.9	0

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2. Joint in Veneers Test Data

No.	Veneer thickness (mm)	Length of Scarf joint (mm)	Slope
1	1.93	51.42	0.04
2	1.45	20.32	0.07
3	2.05	21.69	0.09
4	1.38	41.25	0.03
5	2.00	25.07	0.08
6	3.10	23.15	0.13
7	1.71	13.12	0.13
8	1.54	32.31	0.05
9	2.93	33.96	0.09
10	1.60	14.06	0.11

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3. Moisture Content Test Data

No.	Air-dry Weight (g)	Oven-dry Weight (g)	Moisture Content (%)
1	127.45	114.20	11.6
2	129.44	115.90	11.7
3	129.98	116.22	11.8
4	128.65	115.05	11.8
5	127.10	113.39	12.1
6	129.12	114.34	12.9
7	128.83	114.10	12.9
8	129.37	114.29	13.2
9	127.70	115.23	10.8
10	128.90	113.55	13.5

4. Density Test Data

No.	Length (mm)	Width (mm)	Thickness (mm)	Specimen Mass (g)	Density (12%) (kg/m ³)	Moisture Content(%)
1	101.35	99.38	17.70	127.45	717	11.6
2	100.78	101.21	17.73	129.44	718	11.7
3	99.96	101.16	17.66	129.98	729	11.8
4	99.51	101.11	17.69	128.65	724	11.8
5	101.25	99.11	17.75	127.10	713	12.1
6	100.20	100.85	17.82	129.12	711	12.9
7	99.55	100.95	17.78	128.83	715	12.9
8	101.25	100.42	17.82	129.37	706	13.2
9	101.14	100.45	17.69	127.70	718	10.8
10	101.34	99.18	17.74	128.90	713	13.5

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Page 10 of 18



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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

5. Bond Quality Test Data
Dry Condition

No.	Dry Condition-Bond quality value of Adhesive layer									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1	9	6	7	7	9	9	6	9	6	6
2	7	7	6	6	7	7	7	7	7	8
3	7	6	7	9	6	7	6	7	6	9
4	6	7	7	7	7	6	7	6	7	8
5	7	7	7	7	6	7	7	7	7	8
6	9	7	6	6	7	9	7	9	7	6
7	8	6	7	7	7	8	6	8	6	7
8	8	7	6	9	9	6	9	6	6	6
9	7	7	6	8	7	7	7	7	7	7
10	7	7	9	8	7	6	7	6	6	6
11	7	7	6	7	6	7	6	7	7	7
12	7	9	6	9	7	7	7	7	7	9
13	6	7	7	7	9	7	9	7	7	7
14	8	7	6	7	8	6	8	6	6	9
15	6	6	7	6	8	7	8	7	7	7
16	7	8	6	8	7	7	7	7	7	6
17	9	9	7	9	7	7	7	9	6	7
18	7	8	6	8	6	9	7	7	7	6
19	7	8	7	8	7	8	6	7	6	7
20	6	7	7	7	9	8	7	6	7	6
21	7	7	7	7	7	7	7	7	7	7
22	9	7	7	7	7	9	9	6	7	6
23	8	7	9	7	6	7	7	9	6	7
24	8	7	7	7	7	7	7	7	7	7
25	7	7	7	6	9	6	6	7	6	7
26	7	7	6	7	8	7	7	6	7	6
27	7	7	6	6	8	9	9	7	7	7
28	7	9	9	6	7	8	8	9	7	7
29	7	7	8	9	9	8	8	8	6	6
30	7	8	6	6	7	7	7	8	7	7

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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024



Steam Condition

No.	Steam Condition-Bond quality value of Adhesive layer									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1	5	6	6	9	6	5	6	5	6	6
2	6	6	5	6	6	6	6	6	6	5
3	8	6	5	6	7	8	6	8	6	5
4	7	7	6	6	9	7	7	7	7	6
5	8	7	8	6	6	8	7	8	7	8
6	7	5	7	7	8	7	5	7	5	7
7	8	7	8	7	6	8	7	5	6	6
8	6	6	7	5	5	5	6	6	6	5
9	7	7	8	7	7	6	6	8	6	5
10	5	7	5	6	6	8	6	7	7	6
11	7	5	6	6	8	7	7	8	7	8
12	9	7	8	6	8	8	7	7	5	7
13	7	6	7	7	7	7	5	8	7	8
14	6	8	8	7	4	8	7	6	6	7
15	6	6	7	5	6	6	6	5	6	6
16	6	6	8	7	7	7	7	6	6	5
17	6	5	6	6	5	5	7	8	6	5
18	5	6	7	7	6	7	5	7	7	6
19	6	6	5	7	8	5	6	8	7	8
20	8	6	7	5	7	6	6	7	5	7
21	7	7	9	7	8	8	6	8	7	8
22	8	7	5	5	7	7	7	6	6	7
23	7	5	7	6	8	8	7	7	7	8
24	8	7	6	8	6	7	5	5	7	5
25	6	6	7	7	7	8	7	7	5	6
26	7	7	7	8	5	6	6	9	7	8
27	5	7	5	7	7	7	7	7	6	7
28	7	5	7	8	9	5	7	6	8	8
29	9	7	6	6	6	7	5	6	6	7
30	7	8	7	7	7	9	7	6	6	8

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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

6. Requirements for Overlays Test Data

Adhesion Test

No.	Length (mm)	Width (mm)	Thickness (mm)	Ultimate Load (N)	Adhesion Tensile Strength (MPa)
1	51.44	51.56	17.72	673.7	1.68
2	51.38	51.57	17.83	640.6	1.60
3	51.47	51.29	17.77	623.8	1.56
4	51.41	51.36	17.76	526.6	1.32
5	51.45	51.44	17.93	419.0	1.05
6	51.34	51.48	17.73	546.3	1.37

Bond Quality and Bond Durability

No.	Delamination or Blistering	Wood Failure (%)	
		Overlay 1	Overlay 2
1	None	90	90
2	None	80	90
3	None	80	70
4	None	70	90
5	None	90	80
6	None	90	80

Overlay Cure Test

No.	Length (mm)	Width (mm)	Thickness (mm)	Abnormal Results of Colour and Stain
1	100.18	99.35	17.56	None
2	100.24	100.81	17.43	None
3	100.69	100.47	17.60	None
4	99.64	99.55	17.58	None
5	100.54	100.64	17.47	None
6	100.30	100.75	17.55	None

Water Permeability

No.	Initial Weight (g)	Final Weight (g)	Time of Test (h)	Water Absorption Characteristic, (g/m ² /h)	Anomalies of Surface
1	292.77	293.02	24	1.0	None
2	289.61	289.94	24	1.4	None
3	290.36	290.67	24	1.3	None
4	295.21	295.53	24	1.3	None
5	288.18	288.50	24	1.3	None
6	292.65	292.98	24	1.4	None

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Page 13 of 18



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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

7. Bending Properties Test Data

Orientation	No.	Width (mm)	Thickness (mm)	Span (mm)	Maximum Load (N)	P/Δ (N/mm)	Bending Strength (MPa)	MOE (MPa)	Moisture Content (%)
Parallel to Face Grain	1	302.08	18.10	816	5624.4	119	90.1	15494	12.8
	2	301.94	17.42		4799.4	101	76.9	13114	12.1
	3	301.74	17.78		4896.4	117	78.5	15168	12.9
	4	301.34	17.65		5118.4	108	82.2	14080	12.4
	5	301.77	17.77		5160.2	121	82.8	15723	13.3
	6	301.24	17.63		5348.0	112	85.9	14621	12.8
	7	303.43	17.79		3524.8	102	56.2	13162	12.5
	8	301.11	17.92		5214.2	114	83.8	14852	12.9
	9	302.02	17.65		4108.2	99	65.8	12810	12.6
	10	302.14	17.58		5235.8	113	83.9	14692	13.2
	11	303.18	17.72		4897.4	126	78.2	16334	12.7
	12	303.01	17.62		5623.6	113	89.8	14694	13.1
	13	299.75	17.31		4887.0	99	78.9	12962	13.0
	14	303.18	17.56		5280.8	108	84.3	13911	12.2
	15	301.90	17.60		4942.4	105	79.2	13614	13.0
	16	302.92	17.75		5826.0	117	93.1	15169	12.7
	17	299.44	17.73		6326.0	123	102.2	16076	12.2
	18	301.84	17.56		6106.9	104	97.9	13517	12.7
	19	301.43	17.61		5748.6	126	92.3	16398	12.8
	20	300.64	17.49		5534.3	108	89.1	14093	12.2
	21	302.61	17.50		5740.0	118	91.8	15297	13.2
	22	299.47	17.63		6163.1	103	99.6	13493	13.1
	23	301.57	17.53		5262.6	114	84.5	14830	12.6
	24	302.40	17.45		5023.3	124	80.4	16086	12.4
	25	302.49	17.54		4425.7	100	70.8	12969	13.1
	26	301.34	17.57		6061.4	120	97.4	15622	13.0
	27	300.96	17.48		5902.7	101	94.9	13165	12.9
	28	299.70	17.42		4289.0	119	69.3	15577	12.5
	29	302.09	17.47		5705.8	121	91.4	15713	13.1
	30	301.30	17.46		5152.8	105	82.8	13671	12.8

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Page 14 of 18



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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

Orientation	No.	Width (mm)	Thickness (mm)	Span (mm)	Maximum Load (N)	P/Δ (N/mm)	Bending Strength (MPa)	MOE (MPa)	Moisture Content (%)
Perpendicular to Face Grain	1	301.85	17.74	816	5783.8	116	110.0	20102	11.9
	2	301.15	17.53		6100.4	120	116.2	20701	12.4
	3	300.74	18.20		5612.8	118	107.1	20463	11.7
	4	301.98	17.61		7695.8	126	146.2	21790	13.1
	5	302.10	17.48		5281.0	118	100.3	20393	13.0
	6	300.29	17.61		6271.2	84	119.8	14559	12.0
	7	300.65	17.61		6224.0	114	118.8	19798	12.8
	8	300.42	17.55		5806.0	117	110.9	20247	12.3
	9	300.52	17.47		6352.2	125	121.3	21668	12.5
	10	301.56	17.45		6445.8	110	122.7	18960	12.4
	11	300.55	17.42		6850.4	126	130.8	21879	12.7
	12	301.57	17.42		6172.6	116	117.5	20060	12.2
	13	300.89	17.55		6230.1	116	118.8	20105	12.7
	14	301.44	17.52		6421.2	124	122.2	21452	11.8
	15	301.88	17.56		6004.0	104	114.1	17966	12.9
	16	301.89	17.48		6508.0	112	123.7	19348	11.9
	17	300.41	17.57		5980.5	85	114.2	14756	11.8
	18	300.79	17.51		6201.2	122	118.3	21152	12.2
	19	301.66	17.49		6494.5	85	123.5	14695	11.9
	20	301.06	17.43		6083.1	119	115.9	20613	11.8
	21	301.12	17.60		5658.4	123	107.8	21302	12.4
	22	300.74	17.47		6180.4	124	117.9	21502	11.8
	23	301.45	17.46		6096.4	121	116.1	20933	12.4
	24	301.82	17.45		5885.7	125	111.9	21598	11.8
	25	300.86	17.59		6809.9	120	129.9	20800	12.7
	26	301.96	17.54		5803.4	126	110.3	21761	12.2
	27	301.54	17.44		6072.2	116	115.6	20062	12.0
	28	301.58	17.58		5798.3	127	110.3	21961	12.3
	29	301.05	17.53		6008.0	120	114.5	20787	13.0
	30	301.77	17.50		6217.8	119	118.2	20565	13.1

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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

8. Shear Strength Test Data

Orientation	No.	Length (mm)	Thickness (mm)	Maximum Load (N)	Shear Strength (MPa)	Moisture Content (%)
Parallel to Face Grain	1	201.68	17.60	28407.2	8.0	11.7
	2	201.95	17.72	27466.0	7.7	11.8
	3	201.57	17.58	26383.8	7.4	12.1
	4	201.42	17.57	27051.6	7.6	11.6
	5	200.07	17.55	29572.8	8.4	12.2
	6	199.98	17.67	26436.0	7.5	12.1
	7	200.05	17.65	26975.7	7.6	11.9
	8	201.92	17.71	26961.2	7.5	12.2
	9	200.26	17.72	28372.2	8.0	12.2
	10	201.88	17.59	27494.9	7.7	11.9
	11	201.08	17.62	27829.5	7.9	12.1
	12	201.26	17.69	27596.3	7.8	11.8
	13	200.89	17.68	27391.8	7.7	12.2
	14	200.63	17.60	29485.2	8.4	12.0
	15	200.77	17.69	29212.4	8.2	12.0
	16	200.99	17.62	29366.0	8.3	12.1
	17	200.92	17.60	27303.9	7.7	11.8
	18	200.80	17.65	28612.2	8.1	11.8
	19	201.65	17.70	28393.9	8.0	12.1
	20	201.41	17.56	26746.8	7.6	12.0
	21	201.11	17.72	28191.7	7.9	12.0
	22	201.57	17.61	28984.8	8.2	12.1
	23	200.28	17.66	27698.9	7.8	12.1
	24	201.60	17.61	27330.4	7.7	11.9
	25	201.61	17.62	27422.4	7.7	11.8
	26	200.25	17.66	27504.7	7.8	11.8
	27	201.01	17.65	29088.5	8.2	11.8
	28	200.73	17.71	27340.3	7.7	11.8
	29	201.35	17.58	27515.2	7.8	12.0
	30	200.84	17.72	24822.0	7.0	11.8

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Page 16 of 18



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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

Orientation	No.	Length (mm)	Thickness (mm)	Maximum Load (N)	Shear Strength (MPa)	Moisture Content (%)
Perpendicular to Face Grain	1	200.55	17.61	26063.4	7.4	11.1
	2	200.27	17.49	26042.6	7.4	12.4
	3	200.43	17.55	28171.0	8.0	10.9
	4	200.40	17.58	27443.4	7.8	11.2
	5	199.93	17.73	27136.4	7.7	11.3
	6	200.23	17.57	25416.8	7.2	11.1
	7	200.22	17.69	26956.3	7.6	12.0
	8	200.52	17.71	27198.6	7.7	11.9
	9	200.48	17.58	26744.0	7.6	12.1
	10	200.24	17.68	27983.3	7.9	12.3
	11	200.45	17.52	26480.5	7.5	11.3
	12	200.16	17.73	27488.9	7.7	11.1
	13	200.38	17.57	26234.8	7.5	11.8
	14	200.06	17.60	27437.9	7.8	10.9
	15	200.07	17.71	27492.2	7.8	11.5
	16	200.18	17.66	27195.8	7.7	11.2
	17	199.96	17.54	26449.9	7.5	11.2
	18	200.52	17.70	27323.2	7.7	11.6
	19	200.17	17.69	23197.2	6.6	11.3
	20	200.25	17.55	27341.0	7.8	12.0
	21	200.31	17.58	27776.7	7.9	11.6
	22	200.33	17.67	27699.9	7.8	12.3
	23	200.34	17.50	26506.2	7.6	10.9
	24	200.00	17.72	26744.0	7.5	11.6
	25	199.99	17.61	27797.0	7.9	11.9
	26	200.13	17.49	26094.9	7.5	11.0
	27	200.44	17.68	27963.9	7.9	10.9
	28	200.36	17.59	27011.4	7.7	12.4
	29	200.05	17.51	26246.2	7.5	10.9
	30	200.47	17.65	27831.0	7.9	11.3

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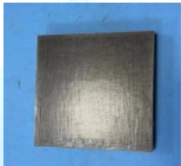
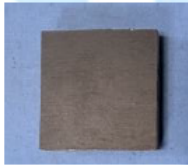
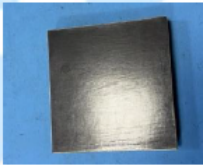
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Report No.: HJ-RD-24154

Issue Date: Aug. 30th, 2024

Appendix II – Typical Sample Photos

	
Bending Properties Test Specimen	Panel Shear Strength Test Specimen
	
Moisture Content Test Specimen	Bond Quality Test Specimen
	
Adhesion Test Specimen	Overlay Cure Test Specimen

Report End

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Assessment Method													
☒ Document from an Accredited Testing Laboratory		Accreditation Details:		☐ Nata: ☒ iLac:		# IAS TL-658		Accreditation scope covers testing?		☒ Yes ☐ No			
☐ Non-Accredited Test Report issued by ISO/IEC 17025 Accredited Laboratory		Details:		Lab #				Similar Testing Capabilities?		☐ Yes ☐ No			
☐ Special Test Facility – University / Specialised / Regulatory etc		Details:						Similar Testing Capabilities?		☐ Yes ☐ No			
☐ Accompanying Validation only		Details:											
☐ Current Certificate of Conformity		License Number:				Issuance Date				Expiry Date			
Reference to other assessed report(s) within assessment		☐ Yes ☒ No		Refer Document									
Acceptable as evidence of suitability		☒ Yes ☐ No		Non-Conformity raised		☐ Yes ☒ No		NC Level: ☐ Minor ☐ Major ☐ Critical		OFI identified		☐ Yes ☒ No	
Identified Limitations or Conditions													
Nil													

SUPPLIED INSTALLATION MANUAL/USER GUIDE/INSTRUCTIONS

Are Installation Instructions required to be supplied per the standard?

☐ Yes ☒ No

If No, section below is not mandatory. For Installation instructions provided where this is NOT a mandatory requirement, this section shall be completed.

TECHNICAL SUMMARY

The basis for the Technical Summary shall be the inclusion of the final STIA (Type Test Plan). Insert relevant columns from STIA Type Test Plan and validate compliance against required clauses.

Models for Certification:	17mm F17 grade plywood
Standard:	AS 6669:2016 Plywood - Formwork
Nominated Test Model(s):	17mm F17 grade plywood
Model(s) Selection Reasoning:	Sole Model

Clause	Compliance Criteria	Supplied Report	Conformity	Comments
1.6.1	Dimensions: When measured in accordance with AS/NZS 2098.4, the actual dimensions of formwork plywood shall not differ from the ordered dimension by more than the following tolerances	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Thickness, width and length all measured within the tolerance requirements
1.6.2	Shape: When measured in accordance with AS/NZS 2098.4, the formwork plywood sheets shall comply with the following requirements: - <i>Squareness</i> - <i>Straightness</i> - <i>Flatness</i>	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Squareness, straightness and flatness all measured within the tolerance requirements
1.7	Moisture Content At the time of the formwork plywood dispatch, the moisture content anywhere within a sheet, when determined in accordance with AS/NZS 2098.1, shall be not less than 6% nor more than 15%.	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Moisture content measured and recorded at 12.2%
1.8	Edge Finish Edges shall be solid (no m1ssmg veneer permitted except where it is associated with permitted open defects), clean cut and square	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Complies with requirements, no missing veneer, clean cut and square to the face

	to the face. Sawing defects within 5 mm of the edge shall be permitted. Where formwork plywood is required to provide Class 2 or Class 3 off-form finish, the panel edge shall be coated to minimize moisture uptake.			
1.9	Joints in Sheets Where structural sheets are jointed, suitable reduction factors shall be applied to characteristic structural properties. These reduction factors shall be established using the in-grade testing method detailed in Clause 5.3, ensuring the joints were tested in the worst load and/or positional combinations.	HJ-RD-24154	☐ Yes ☐ No ☒ N/A	There are no structural jointed sheets in this product.
1.11	Formaldehyde Emission Classes When measured in accordance with AS/NZS 2098 .11, the formaldehyde em1ss10ns from structural plywood shall be in accordance with the limits specified in Table 1.1, for emission classes Super E0 to E1.	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Reported as Super E0 (Average 0.3,0.4 max)
1.12	Branding Each sheet of formwork plywood shall have the following information legibly affixed thereon at the point of manufacture, at least once: (a) The manufacturer's name or registered mark. (b) The words 'formwork plywood' or product description. (c) Reference to this Standard, i.e. AS 6669. (d) Country of origin. (e) The surface quality Classes 2, 3, 4 or 5. Where the surface class differs from face to back, both surface qualities shall be indicated (e.g. Class 2/5).	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	The branding/markings meets the requirements

	(f) Where appropriate, the grade of the veneers (face first, back last), e.g. CC, CD or DD. (g) The bond type of the glue line (e.g. A BOND or B BOND, etc.) (h) The stress grade of the sheet (e.g. FI 7). If different, the stress grades both parallel and perpendicular to the face grain, in that order (e.g. F 17 /F 14). (i) The section properties, as follows: (i) For listed constructions in Table B 1, the panel construction code, e.g. 17-10-7. (ii) For unlisted or non-standard constructions, the second moment of area (I) and the section modulus (Z) in directions parallel and perpendicular to the face grain in that order, as determined in accordance with AS/NZS 2269 .1 (e.g. I-195 Z-22.0/I-33 Z-8.3). U) The formaldehyde emission class, e.g.			
2.1	General Requirements for All Veneers All veneers in a finished sheet of formwork plywood shall comply with the following requirements: (a) Veneers shall be free from decay and active insect attack. (b) Limitation for aggregate defect shall be as follows: (i) For standard veneer qualities F, C and D, in any 300 mm long line drawn across the grain anywhere on the formwork plywood sheet, the aggregate dimension of knots, gaps in edge joints, splits, holes, patches, bark and resin pockets, gum veins and areas of inactive decay shall not exceed 120 mm. (ii) For a non-standard veneer quality, which is permitted provided structural	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Quality C Face Quality C Back

	properties are assigned through in-grade testing in accordance with Clause 5.3, limitations for aggregate defect shall be defined in the manufacturing specification. In non-standard quality veneer, the impact of aggregate and individual imperfection on surface finish quality shall be taken into consideration. NOTE: For measurement of aggregate defects, see Figure 2.1. (c) Veneers shall be smoothly and tightly cut to a uniform thickness. (d) Veneers may be in more than one piece.			
2.2	QUALITY F VENEER	N/A	☐ Yes ☐ No ☒ N/A	N/A
2.3	QUALITY C VENEER	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Quality C Face Quality C Back
2.4	QUALITY D VENEER	N/A	☐ Yes ☐ No ☒ N/A	N/A
3.2	CLASS 2 OR CLASS 3 SURFACE FINISH	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Class 2 as reported in inspection report
3.3	CLASS 4 SURFACE FINISH	N/A	☐ Yes ☐ No ☒ N/A	Not Claimed
4.1	JOINTS IN VENEER The following apply to the edge joints in veneer: (a) Edge-jointed face veneers shall comply with the requirements of veneer quality specified in Section 2 for each veneer grade. (b) Edge joints in quality F face veneer exceeding 2 mm in thickness shall be edge bonded. Edge joints in quality F face veneers less than 2 mm in thickness, and qualities C and D face veneers need not be edge-bonded. (c) Underlay veneers-open edge joints in underlay veneers shall be permitted subject to the following limitations:	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	Scarf Joint measured and reported as 0.08

	(i) Individually not exceeding 3 mm for surface Class 2 or 6 mm for surface Class 3 measured across the grain. (ii) The aggregate width of open edge joints in any one ply shall not exceed 10 mm in any 300 mm of edge. (d) Other internal veneers-open edge joints in other internal veneers shall be permitted subject to the following limitations: (i) Individually not exceeding 10 mm measured across the grain. (ii) The aggregate width of open edge joints in any one ply shall not exceed 10 mm in any 300 mm of edge.			
4.2	Structural Joints in Formwork Plywood Sheets End and edge joints in formwork plywood sheets shall be effected by structural joints through the full thickness of the sheet in accordance with the following requirements: (a) The sheets to be jointed shall be of the same construction. (b) The joint shall be through the full thickness of both sheets. (c) For scarf joints, the slope of the scarfs shall not be steeper than the following: (i) For sheets less than 12 mm thick 1 in 10. (ii) For sheets 12 mm thick and over 1 in 8 (d) Corresponding plies shall be aligned within $\pm 10\%$ of the thickness of the thinnest ply in the sheet. (e) The grain direction of corresponding plies shall be the same. (f) Bonding of joints in formwork plywood sheets shall be effected by an adhesive of strength and durability at least equivalent to	N/A	☐ Yes ☐ No ☒ N/A	No Structural joints reported in this product.

	that used in the manufacture of the formwork plywood sheet. (g) When tested in accordance with AS/NZS 2098.3, test pieces of Type 2 shall not fail in the glue line of the joint. Test pieces of Type 1 shall have a bond quality of the joint of not less than 2 and an average of not less than 5 as assessed in accordance with AS/NZS 2098.2. (h) Suitable reduction factors shall be applied to characteristic structural properties. These reduction factors shall be established using the in-grade testing method detailed in Clause 5.3, ensuring the joints were tested in the worst load and/or positional combinations.			
4.3	Bonding The bonding between plies shall be a Type A or Type B bond	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	The test results meet the requirements.
4.5	Requirements for Overlays Overlays when subjected to the adhesion, bond quality and bond durability, overlay cure tests and water permeability tests specified in Appendix F shall meet requirements specified in Table 4.2.	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	The test results meet the requirements for: - adhesion test 1.43MPa - bond quality and durability, 8.3 / None - overlay cure test, None - water permeability. 1.3
5.1	APPLICATION OF STRESS GRADES AND MECHANICAL PROPERTIES TO FORMWORK PLYWOOD PANELS - GENERAL Formwork plywood panels that are manufactured from veneers of the qualities prescribed in Clauses 2.1 to 2.5 shall have an F-grade, stress-grade or have characteristic strength and stiffness properties assigned by one of the procedures set out in this Section. The methods cover the application of F-grades based on mechanical F-grading or in-grade	N/A	☐ Yes ☐ No ☒ N/A	N/A

	testing of formwork plywood in the finished form. Other stress grades with specific characteristic strength and stiffness properties shall be determined in accordance with Clause 5.3.			
5.2	Mechanically F-Graded Formwork Plywood Sheets	HJ-RD-24154	☒ Yes ☐ No ☐ N/A	MoE Parallel 14564 MPa meets F17 MoE Perpendicular 20066 MPa meets F17 Bending Parallel 84.5 Bending Perpendicular 117.5 Panel Shear Parallel 7.8 Panel Shear Perpendicular 7.6 Second moment of area (I) Parallel – I: 245.8 Perpendicular – I: 184.9 Section Modulus (Z) Parallel – Z: 28.1 Perpendicular – Z: 23.7

SUMMARY OF FINDINGS

Audit results are known as findings. Findings are generated throughout the audit and are used to indicate if there are non-conformities, and their severity, within the audit and certification requirements.

Findings can also recognise and identify opportunities for improved performance for the auditee. These are to be listed as 'Opportunities for Improvement (OFI)'.

OPPORTUNITIES FOR IMPROVEMENT

OFI #	OFI	Details
-	-	-

NON-CONFORMITIES RAISED

Non-Conformity Type shall be identified as Critical, Major or Minor and shall state:

- The current condition - what the auditor saw, heard and/or read.
- The documented internal and/or external requirements or standards against which the Non-Conformity is measured.

All Non-Conformities are required to be reviewed by the auditor and the auditee. The auditor is required to ensure that the evidence is accurate and the auditee understands the cause and effect of the non-conformance.

CMI confirms the following close out timeframes are issued as a result of a Non-Conformity:

Minor – Dependant on the nature of the N/C

Major – 7 days

Critical – Immediate rectification. Products shall not be produced until the Critical Non-Conformity is closed.

Any identified Non-Conformities shall be documented herein and supplied to the Applicant.

NC #	NC Type	Close out Date Advised to Client	Appropriate Action(s)
-	-	-	☐ Onsite verification audit required prior to close out ☐ Verification to be conducted at next scheduled Surveillance ☐ Technical Assessment of required documentation ☐ Revision of Evaluation Plan & Certification Agreement ☐ Other: [Insert details of other]

RECOMMENDATION

From the above evaluation of the product, sufficient technical information has been provided to certify the product and that the Phuc Khanh Construction Investment and Trading Joint Stock Company Formwork Plywood complies with the requirement of the Standard(s)/Specification(s) Product Certification Scheme Rules.

NEXT ACTION

- ☐ Further information, as detailed in this Technical Assessment is required, in order to proceed.
- ☒ The requirements of the Standards/Specification(s) and Scheme Rules have been met. Certification is recommended, proceed to Certification Review & Decision.

Any change in the information referenced, including product design as detailed in this report to suit future re-organisation or planning including the superseding of the reference documents, will require further assessment to confirm compliance with the appropriate references.

COMPLETED BY

I confirm in completing this Assessment, I have the necessary knowledge & understanding of the identified standard(s)/Specification(s) requirements for the product evaluated as well as the requirements of the CMI ProdCert Scheme Rules.

Signature:	
Name:	Allan Pollock
Date:	06/09/2024

For, and on behalf of, CMI

CONDITIONS

1. This audit report:
 - Relates only to the product(s) or system(s) that are named and described at the beginning of the report.
 - Is issued to the company and/or person named on the front page. The company and/or person may hold or claim all entitlements to this report.
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 - Are maintained at or above the levels which have been assessed and found to be satisfactory by CMI.
 - Continued to be checked as and when deemed appropriate by CMI.
 - Are reviewed by CMI as and when it considers appropriate.
3. Any information relating to the manufacture, supply, installation, use and maintenance of the product(s) or system(s) which is contained or referred to in this report, are the minimum required to be met when the product(s) or system(s) is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Australian State and Territory OH&S/WHs Acts or of any other statutory, common law or other duty which may exist at the date of this report. Nor is conformity with such information to be taken as satisfying the requirements of any statutory, common law or other duty of care.
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