Q-MARK REGISTRATION SCHEDULE
FOR
STRUCTURAL PLYWOOD

Company	**:**	Huaian Arser Wood Co. Ltd
Address	**:**	No 10 Yanhuang Road West Industrial Zone Lianshui Jiangsu China
Establishment ID	**:**	056/2698

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1 INTRODUCTION

The Q-Mark Structural Plywood Scheme is a Third Party Product Certification Scheme operated by BM TRADA Certification Ltd.

The scheme is based on the principles of ISO 9001, EN 45011, EN ISO 17025, ISO Guide 62/65 and confirms compliance with EN 13986, together with a specific set of performance criteria set by BM TRADA (as defined in Clause 5 of this document) in order to attain a product which performs to a high standard. The relevant standards listed above are to be read in conjunction with this document. As the Scheme meets all the requirements of the harmonised standard EN13986, CE marking is also possible following a favourable assessment.

The Scheme covers Factory Production Control (FPC), documentation and test/assessment evidence, and the resultant certification is specific to clearly defined products and their constituent components.

The objectives of the scheme are:

- To improve the quality and performance of Structural Plywood.
- To provide unambiguous evidence of compliance with the standard or methods listed above.
- To provide specifiers, regulators and inspection authorities with the appropriate information for them to identify suitable products.

2 DEFINITIONS & ABBREVIATIONS

The following definitions and abbreviations are used throughout the document. Other definitions are as given in the relevant standards.

Assessment	A considered judgement as to whether products meet the criteria laid down in the relevant Technical Specification.
Audit	Visit by BM TRADA or other certification body to examine the quality management system and production processes of a manufacturer or supplier, usually to determine appropriate compliance to ISO 9001, with specific emphasis on the factory production control elements.
Member	Company holding membership of the Q-Mark Scheme.
QMS	Quality Management System (e.g. one meeting BS EN ISO 9001).
Schedule	The certification schedule, which identifies the scope and range of products covered by the membership certificate.
Scheme	The BM TRADA Q-Mark Structural Plywood Scheme.

3 SCOPE

The Scheme is applicable to veneer plywood (as defined in BS EN 313-2 and BS EN 636) for structural use in external or internal conditions, which fall within the scopes of the product standards referenced in clause 1 of this document, and applies to products as manufactured and supplied, and before being installed into the works. The manufacturer has completed stage 1, 2 and 3 of the ITT and FPC requirements for the scheme.

3.1 Product Description

Huaian Arser Q-Marked plywood consists of a Phenol Formaldehyde bonded Eucalyptus or Poplar core, and a Melamine Urea Formaldehyde bonded hardwood face and back. The following thicknesses have been tested and assessed under this certificate.

9mm; 12mm; 15mm; 18mm

3.2 Intended Use

Under the scope of this certification, Huaian Arser Plywood has been certified for structural use as floor decking, wall sheathing, and roof sheathing as described in Section 7. It is considered to meet the minimum relevant requirements of the building regulations in the UK. It is pre-supposed that this is only when used in accordance with the guidelines detailed in this document and for the declared specific end uses. For structural use, the properties given in Section 7 may be used in design to ensure an appropriate product thickness is selected to resist the imposed load.

4 BUILDING REGULATIONS

Plywood is certified under the BM TRADA Structural Plywood Q-Mark Scheme. It is the opinion of BM TRADA that if used in accordance with the requirements of this scheme and with recognised good practice and design, then the product will satisfy, or contribute to satisfying the relevant requirements of the following Regulations:

- The Building Regulations 2010 (England and Wales), The Building (Amendment) Regulations 2011
- The Building (Scotland) Regulations 2004, The Building (Scotland) Amendment Regulations 2011
- The Building Regulations (Northern Ireland) 2000

5 SCHEME REQUIREMENTS

5.1 Minimum Quality Requirements for Veneer Plywood

5.1.1 General

1. The manufacture of the Plywood has been carried out in accordance with BS EN 636 and BS EN 13986 and the manufacturer has established and is operating a satisfactory factory production control (FPC) system complying with BS EN 326-2.
2. The manufacture maintains and adheres to a documented Quality Control Manual.
3. The Glue bond quality has been verified as meeting the requirements of an exterior quality bond in accordance with BS EN 314.

5.1.2 Material Quality

5.1.2.1 Veneers

Veneers were sliced/rotary cut and both outer plies of panels were prepared in the same manner. A veneer grading system, as defined in BS EN 635 and BS EN 1088 was used in defining the quality of veneers used in the manufacture, and these meet the Scheme. The permissible number of natural and manufacturing characteristics does not exceed the specified limits.

5.1.2.2 Adhesives and Fillers

Phenol and Melamine Urea formaldehyde adhesive is used in the manufacture of the product. The requirements for an exterior bond, in accordance with BS EN 314-2 are met.

5.1.3 Lay-up and Panel Structure

5.1.3.1 Thickness and Number of Structural Veneers

The product conforms to the minimum requirement of 8mm in thickness and a minimum of three structural veneers. Plywood greater than 15mm in thickness is made up of more than five veneers.

The decorative outer layer has been deemed to make no significant structural contribution to the product. The face veneers (0.45 – 0.5mm in thickness) are considered to be too thin to be

tested in accordance with BS EN 314, but have been shown to pass the 72 hour boil test without delamination.

5.1.3.2 Lay-up

The product has been manufactured such that the adjacent plies are laid up with their grains at right angles to each other. For products with an even number of veneers, the core comprises of two parallel veneers of equal thickness and same species.

5.1.3.3 Structure after Sanding

After sanding:

- The combined thickness of the two outer structural plies of three ply panels is not less than 40% or more than 65% of the nominal, un-sanded thickness.
- The thickness of each of the two outer plies, combined with those of the core and other inner plies with the grain direction parallel to the outer plies for multi-ply panels is not less than 40% or more than 65% of the nominal un-sanded thickness of the panel.

5.1.4 Durability

The durability of the species has been determined in accordance with BS EN 350-2. The species and species durability have been declared. The species has been declared as Eucalyptus and Poplar, both which have a variable durability class, and in the absence of specific test data the veneers are therefore deemed to be of Durability Class 5 in accordance with EN 350-2. In the opinion of BM TRADA, plywood used in exterior conditions will require the application of a suitable preservative or coating to provide Biological durability. Guidance on whether preservative treatment is required in any specific application should be sought from DD ENV 1099.

5.1.5 Panel Requirements

5.1.5.1 Dimensional Tolerances, Squareness and Edge Straightness

Tolerances on dimensions, squareness and straightness are in compliance with the requirements of BS EN 315.

5.1.5.2 Moisture Content

The moisture content was determined in accordance with EN 322. The average moisture content is given in Table 1**.**

Table 1: Average Moisture Content

Thickness (mm)	Average Measured Moisture Content (%)
9	10
12	7
15	10
18	7

5.1.5.3 Manufacturing Defects

The finished product does not contain any manufacturing defects such as core gaps, sanding through, foreign particles or edge defects.

5.1.6 Bonding Quality

The requirements for an exterior bond are met. For a summary of the ITT results see Section 7.

5.2 Quality Management System (QMS)

Initial inspection has shown that the manufacture of the products has been conducted under the control of an appropriate QMS.

The QMS shall be subject to regular audit (typically one per month).

5.3 Documentation

The following documents are controlled under the requirements of this scheme:

- Manufacturing documentation (e.g. Quality Manual, procedures)
- Product specification/range documentation
- Test Reports and Sampling
- Q-Mark Certificate and Schedule

5.3.1 Manufacturing Documentation

The Member has supplied details of his manufacturing documentation to BM TRADA for assessment. This comprised of the Quality Manual, procedures, works instructions and test data.

5.4 Minimum QMS Requirements

5.4.1 Factory Production Control

As part of the documented process control procedures the company has demonstrated that:

- The product is being fabricated in accordance with documented manufacturing procedures from purchase of raw material to the production of the finished product.
- These procedures control all critical aspects of the production.
- Target limits are defined at each one of these areas.
- All performance characteristics claimed are controlled in order to remain consistent by including appropriate checks or testing in the QMS to ensure a consistent and similar product is produced.

5.4.2 Management Responsibility

The management of the company carries out regular reviews of the system, which include production records and any complaints that have been received. Notes are kept of any topics discussed and decisions made.

5.4.3 Company Representative

A member of the management team is responsible for the QMS.

5.4.4 Internal Audits

Routine internal audits are carried out to ensure compliance with the requirements of the scheme is met.

5.4.5 Documentation

Inspection and test records are kept in a format that is acceptable to BM TRADA Certification for a minimum of 5 years.

5.4.6 Work Instructions

Work instructions and target values are placed at the critical production points throughout the manufacturing process.

5.4.7 Procedures for Non-conforming Product

Where factory production control/target values are out of specification there is a procedure for identifying and correcting these deficiencies. The factory production control system has been assessed and found to be able to detect non-conforming product quickly enough so that affected product can be quarantined.

5.4.8 Traceability

There are procedures, which enable appropriate traceability of production runs through to dispatch.

5.4.9 Training

The company maintains records to show that staff has been satisfactorily trained to undertake the manufacturing and inspection tasks that they have been assigned. Records are kept of this training and the personnel's job description shall be clearly defined.

5.4.10 Complaints

The company maintains a register of all complaints received on the quality of their product, which shows the steps that have been taken to deal with the problem and analysis of the causes. These records are maintained for a minimum of 5 years.

5.4.11 Document Control

Procedures are in place for effectively controlling the quality of documentation issued to the relevant personnel, so that they have up-to-date procedures.

5.4.12 Machinery Maintenance and Calibration

All machinery and measuring / testing equipment that could affect the quality of the product is properly maintained and calibrated so that a consistent product can be produced and tested. There is a maintenance and calibration schedule. A record is kept of the maintenance and calibration carried out.

5.5 Other Requirements of the Scheme

5.5.1 Product Specification/Range Documentation and Assessment

The member has supplied BM TRADA with product details for review. These included material specifications, dimensions, tolerances and components. This product specification forms part of the manufacturing procedure.

Should the product specification of the certified product/s change, the member shall inform BM TRADA of the changes. A decision on the way forward shall be made to ensure continuation of certification.

5.5.2 Transport and Storage Instructions

This must be carried out in accordance with the manufacturer's instructions. The member shall ensure that adequate storage and transport instructions are supplied with each pack or consignment of product. Any alterations to the instructions shall only be made following consultation with BM TRADA.

6 TEST AND VERIFICATION REQUIREMENTS

6.1 Test Reports and Sampling

BM TRADA has assessed the results of any testing and sampling, and/or calculation that has been carried out in accordance with the scheme rules. All testing has been conducted by a laboratory approved and monitored by BM TRADA.

7 INITIAL TYPE TESTING

7.1 Mechanical Resistance and Stability

7.1.1 Bond Quality

The Bond Quality was tested in accordance with EN 314-1. A total of 18 panels were tested, with 10 test specimens per glue line. The average Bond Quality and corresponding Wood Failure percentages are given in the Table 2. Pass/Fail criteria are given in EN 314-2.

Table 2: Average Bond Quality & Wood Failure %

Thickness (mm)	Failure Load (N/mm^2)	% Wood Failure	Pass/Fail
9	0.82	75.87	Pass
12	0.92	73.98	Pass
15	0.90	74.34	Pass
18	0.94	73.59	Pass

7.1.2 Bending Strength

The Bending Strength was tested in accordance with EN 310. 6 specimens were tested from each of the 18 Panels. Testing was carried out in both the longitudinal and cross direction. Characteristic values and strength classes are given in Table 3.

Table 3: Characteristic Bending Strength (MOR)

Property	Thickness (mm)							
MOR (N/mm^2)	9		12		15		18	
	Class	Charact. Value $f_{m,k}$	Class	Charact. Value $f_{m,k}$	Class	Charact. Value $f_{m,k}$	Class	Charact. Value $f_{m,k}$
Long.	F20	30	F15	23	F15	23	F15	23
Cross	F25	38	F20	30	F15	23	F15	23

7.1.3 Modulus of Elasticity

The Modulus of Elasticity was tested in accordance with EN 310. 18 Panels were tested with 6 test specimens taken from each panel in both, the longitudinal and cross direction. Characteristic values and modulus classes are given in Table 4.

Table 4: Characteristic Modulus of Elasticity (MOE)

Property	Thickness (mm)							
MOE (N/mm^2)	9		12		15		18	
	Class	Mean Modulus Values $E_{m,mean}$	Class	Mean Modulus Values $E_{m,mean}$	Class	Mean Modulus Values $E_{m,mean}$	Class	Mean Modulus Values $E_{m,mean}$
Long.	E30	3000	E30	3000	E30	3000	E30	3000
Cross	E60	6000	E40	4000	E30	3000	E30	3000

The 5 % characteristic values for bending modulus (stiffness) should be taken as 0.8 times the mean values given in Table 4.

7.1.4 Impact (Soft Body) Walls, Floors and Roofs

The Soft Body Impact tests have been determined in accordance with EN 596 for Walls and EN 12871 and EN 1195 for Floors and Roofs. The results are tabulated in Table 5.

Table 5: Impact Test Results

Thickness (mm)	Application	Support Spacing (mm)	Impact Test Result
12	Wall	600	Pass
15	Floor	600	Pass
18	Floor	600	Pass

7.1.5 Concentrated (Point) Load

The concentrated (point) load was determined in accordance with EN 1195 and is based on three (3) tests rather than the recommended 12. The results have been adjusted by the factor given in Table 9 of EN 12871. These values are for use with Eurocode 5 and should be adjusted with appropriate factors including Service Class and duration of load.

Table 6: Concentrated Point Load

	Thickness (mm)	
	15	18
Joist Spacing	600	600
$F_{max, 0.5}$	3.82	4.25
R_{mean}	411	650

Note: F = Force/Load in kilo Newton's

R = Stiffness of the structural decking or sheathing in kilo Newton's per millimetre.

7.2 Safety in Case of Fire

7.2.1 Reaction to Fire

The Reaction to Fire classification is D-s2, d0. This is without an air gap behind the panel and is based on EN 13986 CWFT.

7.2.2 Resistance to Fire

No enhanced fire resistance performance is claimed by the manufacturer.

7.3 Hygiene, Health and Environment

Based on a declaration by the manufacturer, the product does not contain any dangerous substances as defined in the EU database of dangerous substances, apart from formaldehyde. The product has an E1 formaldehyde classification.

7.4 Safety in Use

Refer to 7.1.4

7.5 Protection against Noise

Protection against noise has not been evaluated. This shall be evaluated for the structure as a whole.

7.6 Energy Economy and Heat Retention

Energy Economy and Heat Retention shall be evaluated for the structure as a whole.

7.7 Performance Verification

An ongoing programme for performance verification has been agreed with the client.

8 IDENTIFICATION AND USE OF THE BM TRADA AND Q-MARK LOGOS

Correct identification of certified Structural Plywood is vital in order that purchasers and controlling authorities clearly understand the status of products presented to them. It is therefore a requirement that every individual panel covered under the Scheme is identified as "BM TRADA Q-Mark Certified" or other similar wording, and/or display the Q-Mark badges. This will assist subsequent inspection authorities to recognise acceptable products. For similar reasons, Members are encouraged to make use of the marks on marketing and technical documentation.

As the Scheme is based upon the requirements of EN 13986 and BM TRADA conducts regular on-going surveillance, CE conformity is assured. Refer to Annex 1 for approved Q-Mark logo's.

9 GUARANTEES

The scheme makes no requirement on its Members to give a minimum guarantee. This is entirely up to the discretion of the Member.

ANNEX 1- APPROVED Q-MARK LOGO(S)

PLY-005 Stage 1; 2 & 3 Plywood for Structural Use as Walls, Floors & Roofs in Service Class 1,2 & 3 Natural Durability : 5 (Non Durable, requires treatment for Exterior Use) Adhesive: Phenolic Core & MUF Face & Back	PLY-005 Stage 1; 2 & 3 Plywood for Structural Use as Walls, Floors & Roofs in Service Class 1,2 & 3 Natural Durability : 5 (Non Durable, requires treatment for Exterior Use) Adhesive: Phenolic Core & MUF Face & Back	PLY-005 Stage 1; 2 & 3 Plywood for Structural Use as Walls, Floors & Roofs in Service Class 1,2 & 3 Natural Durability : 5 (Non Durable, requires treatment for Exterior Use) Adhesive: Phenolic Core & MUF Face & Back
CE 1224-CPD-0222 Huaian Arser Wood Co. Ltd No. 10 Yanhuang Road West Industrial Zone Lianshan, Jiangsu China 11 EN 13986:2004 EN 636-3 S E1 D-s2,d0 9mm 600 kg/m^3	CE 1224-CPD-0222 Huaian Arser Wood Co. Ltd No. 10 Yanhuang Road West Industrial Zone Lianshan, Jiangsu China 11 EN 13986:2004 EN 636-3 S E1 D-s2,d0 12mm 600kg/m^3	CE 1224-CPD-0222 Huaian Arser Wood Co. Ltd No. 10 Yanhuang Road West Industrial Zone Lianshan, Jiangsu China 11 EN 13986:2004 EN 636-3 S E1 D-s2,d0 15mm 500 kg/m^3

PLY-005

Stage 1; 2 & 3

Plywood for Structural Use as

Walls, Floors & Roofs

in

Service Class 1,2 & 3

Natural Durability : 5

(Non Durable, requires treatment for Exterior Use)

Adhesive: Phenolic Core & MUF Face & Back

CE

1224-CPD-0222

Huaian Arser Wood Co. Ltd

No. 10 Yanhuang Road

West Industrial Zone

Lianshan, Jiangsu

China

11

EN 13986:2004

EN 636-3 S

E1

D-s2,d0

18mm

600kg/m^3

10 APPENDIX 1 – NORMATIVE DOCUMENTS

BS 5268 Part2: 2002	Code of Practice for permissible stress design, materials and workmanship.
EN 1995 Eurocode 5:2004	Design of timber structures.
BS EN ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories.
BS EN 45011:1998	General requirements for bodies operating product certification systems
BS EN 45012:1998	General requirements for bodies operating assessment and certification/registration of quality systems.
ISO 9001:2000	Quality management systems. Requirements.
BS EN 13986:2004	Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking.
BS EN 335-1:2006	Hazard Classes of wood and wood based products against biological attack. Classification of hazard classes.
BS EN 313-1	Plywood classification and terminology – Part 1. Classification.
BS EN 313-2	Plywood classification and terminology – Part 2. Terminology.
BS EN 636	Plywood – Specifications.
BS EN 326-2	Wood-based panels – Sampling, cutting and inspection – Part 2. Quality control in the factory.
BS EN 635	Plywood – Classification by surface appearance – Part 1. General
BS EN 1088-1	Marine plywood – Part 1. Requirements
EN 350	Durability of wood and wood-based products – Natural durability of solid wood.
BS EN 315	Plywood – Tolerances for dimensions.
BS EN 322.	Wood-based panels. – Determination of moisture content.
EN 314-1	Plywood – Bonding.-Part 1.- Test methods.
EN 314-2	Plywood – Bonding.-Part 2.- Requirements.
EN 310	Wood-based panels. – Determination of modulus of elasticity in bending and of bending strength.
EN 596	Timber Structures – Test methods – Soft-body impact tests of timber framed walls.
EN 12871	Wood-based panels. – Performance specifications and requirements for load bearing boards for use in floors, walls and roofs.
EN 1195	Timber Structures – Test methods – Performance of structural floor decking.