

FIBER POLYMER COMPOSITE MATERIAL SPECIFICATION

PART 1 : GENERAL

1 SECTION INCLUDES

- A. Organic Fiber - Polymer Composite Extruded Profiles.

1.2 RELATED SECTIONS

- A. Rough Carpentry.
Joists and structural framing.

2 REFERENCES

- A. Taber Abrasion ASTM D 4060:2000 - Standard Test Method for Abrasion Resistance of Organic Coatings By the Taber Abraser.

- B. Coefficient of Thermal Expansion by Thermo Mechanical Analysis (TMA) ISO11359-1999 - Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermo Mechanical Analysis.

- C. Salt Spray ASTM B117:2011 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

- D. Flexural Strength ASTM D790-2010 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulation Materials.

- E. Drop Impact ASTM D2794:1993(2010) - Standard Test Method for Resistance of Organic Coating to the Effect of Rapid Deformation.

- F. DIN EN 11341 – Artificial Weathering Test of Selected Material

- G. Skid Resistance ASTM E303:2008 – Standard Test Method for Measuring Surface Frictional Properties using the British Pendulum Tester.

- H. Density ASTM D2395:2007 - Standard Test Method for Specific Gravity of Wood and Wood Base Materials.

- I. ISO 75 - Plastics -- Determination of temperature of deflection under load -- Part 1: General test method.

- J. Shore D Hardness ASTM D2240:2000 - Standard Test Method for Plastic Property Durometer Hardness.

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2 REFERENCES (CONT'D)

- K. Water Absorption ASTM D 1037:2012, Clause 100 to 106 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- L. Chemical Resistance ASTM D2299-1968(1982) using Household Detergent, Ammonia (5%) , Salt (20%), etc.
- M. ASTM E84 – Standard Method Test For Surface Burning Characteristics for Building Materials. (For Flame Retardant Grade)

Fire Test BS476 Part 7: 1997, to determine the tendency of a material or a combination of materials to support the spread of flame across its surface. (For Flame Retardant Grade)
- N.
- O. ASTM D3273 – Standard Test Method For Resistance Against Discolouring And Micro-Fungi.

3 DELIVERY, STORAGE AND HANDLING

- A. Store products off the ground, on a flat surface or on blocking spaced not more than 500mm apart.

4 WARRANTY

- A. 15 years limited manufacturer's warranty against rot, decay and manufacturing defects.

PART 2 : PRODUCTS

1 MANUFACTURER

- A. **Waler Precision Mfg Sdn. Bhd.**
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1 Middle East HEAD OFFICE

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2 MATERIAL

A. Organic Fiber-Polymer Composite Profile shall be manufactured from a composition of organic fiber and high impact vinyl acrylic material (with a minimum of 45:55 ratio) absolutely without any wood content with High Density of 1.45 g/cm³. The materials are able to withstand abrasion, weather resistant and fire retardant.

1. Colour : Natural Wood Colour. Refer to Manufacturer's colour Chart for details.
2. Taber Abrasion Resistance : Change in weight average 0.039% after 1000 cycles with tested in accordance with ASTM 4060
3. Coefficient of Linear Thermal Expansion: 4.25 X 10⁻⁵ mm/mm/°C from (-20oC to 20oC) and 7.32 x 10⁻⁵ mm/mm/oC (30oC to 70oC)when tested in accordance with ISO11359-1999.
4. Salt Mist Test : No visual change was observed after 48 hours when tested in accordance with ASTM B117.
5. Flexural Strength : 29.8 N/mm² average, minimum when tested in accordance with ASTM D 790 (Model DKG 5.5/1)
6. Drop Impact Strength: No crack at 140kg-cm (supported area of extruded hollow profile) and No crack at 70kg-cm (hollow area of extruded hollow profile) when tested in accordance with ASTM D2794.
7. Artificial Weathering Test For Selected Materials after 2000 hours: minor change in color , when stated in accordance with DIN EN 11341
8. Skid Resistance: 47 units minimum, when tested in accordance with ASTM E 303.
9. Density : 1.4 g/cm³ average, when tested in accordance with ASTM D2395.
10. Heat Distortion Temperature under load 1.8 N: 62°C average, when tested in accordance with ISO 75.
11. Shore D Hardness: 88 median, when tested in accordance with ASTM S2240.
12. Water Absorption: 0.436% maximum, change in weight after 24 hours when tested in accordance with ASTM D 1307.

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2 MATERIAL (CONT'D)

- Chemical Resistance: No significant changes on the surface was observed after 24 hours when tested Using Household Detergent, Ammonia (5%), Salt (20%), Anti- Freeze, Kerosene, Paint Thinner, Turpentine, Chlorine (10%), Sulphuric Acid (3%), Muriatic Acid (10%).
- 13.
 14. Surface Burning Test for 10 min : Class A according to ASTM E84.
 15. Fire Test BS476 Part 7:1997 : The test results show the materials has a Class One Surface Spread of Flame.
 16. Resistance to mould and discoloring : average rating 1.

For more information, please email : info@tree-pal.com

For Project Reference, please visit our website : <http://www.tree-pal.com>

No.	Properties	Method	Result
1	Density	ISO 1183	1.46 g/cm ³
2	Hardness	ASTM D2240 : Shore D Hardness Test	88 Shore D
3	Flextural Properties	a) ASTM D790-03 Determination of Flexural Strength Profile : 140 mmx 38 mm	28.24 Mpa
		b) ISO 178 - Determination of Flexural Properties Flexural Strength	46 MPa
		c) ISO 178 - Determination of Flexural Properties Flexural Modulus	3850 MPa
		d) ISO 178 - Determination of Flexural Properties Flexural Strain At Break	2.50%
4	Shear Strength	STMS-2774 Shear Strength Profile : 140 mmx 38 mm	12.82 Mpa
5	Compressive Strength	ASTM D695-08 Compressive Strength Profile : 140 mmx 38 mm	39.40 MPa
6	End Bearing Test	End Bearing Test Profile : 140 mmx 38 mm	12488 N
7	Nail Pull Off Test	STMS -2775 Pull Off Test Profile : 140 mmx 38 mm	6009 N
8	Slip Resistance	a) ASTM C1028-7 The Static Coefficient of Friction Dry Condition Wet Condition	0.78 kgf 0.89 kgf
		b) ASTM E303:1993 (2008) Skid Resistance Non Coating Vertical Horizontal Coating Vertical Horizontal	55 units 71 units 52 units 47 units
		c) DIN 51097 -Testing of floor coverings; determination of slip resistance; barefoot areas exposed to wet.	Classification C
9	Resistance to Fungus/Bio	a) DINV ENV 12038:2002 Durability of wood and wood-based products - wood-based panels - Method of test for determining the resistance against wood-destroying basidiomycetes	No attack by test fungi, highest durability class 1.
		b) CEN/TS 15083-2 Determination of durability against Rot Fungi	No attack by test fungi, highest durability class 1.
		c) ASTM D3273 - Resistance against mould & discoloring.	Rating 1- resistance to infection of mould and discoloring
		d) ASTM E1428 & ASTM G2196 - Mildew & Pink Stain Resistance.	Light Growth
10	Fire Behaviour	a) DIN 4102-1 (May 1998) Flammability (Building Material Class B1)	Class B1
		b) DIN EN 1350-1 : 2007 Fire classification of construction products and building elements - Part 1	Class E
		c) ASTM E84-09 Surface Burning Characteristic of Building Materials	Class A

No.	Properties	Method	Result
		d) BS 476 Part 6:1989+A1: 2009 - Fire Propagation Test Sub Index1 Sub Index2 Sub Index3 Fire Propagation Index I BS 476 Part 7:1997 - Fire Classification Building Regulation 2006 Approved Document B, UK Requirements : Propagation Index I < 12 Sub Index < 6	1.01 0.89 0.47 2.37 Class 1 Class 0
		e) ASTM E84-09 Surface Burning Charateristic of Building Materials (CP140)	Class A
11	Chemical Analysis	a) RoHs Compliance Test Cd (< 100 ppm) Lead (<1000 ppm) Mercury (< 1000 ppm) Hexavalent Chromium Cr+6 (< 1000 ppm)	Not Detectable Not Detectable Not Detectable Not Detectable
		b) Substances of Very High Concern (SVHC) Compliance 53 substances < 0.1% (REACH)	All Not Detectable
12	Accelerated Weathering	QUV a) 1200 Hrs b) 500 Hrs, 1000 Hrs, 1500 Hrs	No obvious Changes
		c) Xenon Test for 2000 Hrs	Very small change color
13	Tensile Properties	a) ISO 527 - Determination of Tensile Properties Tensile Strength (Max.)	21.8 MPa
		b) ISO 527 - Determination of Tensile Properties Elongation At Break	2.20%
		c) ISO 527 - Determination of Tensile Properties Tensile Modulus	2340 MPa
14	Impact Properties	ISO 180 - Determination of Izod Impact Strength Notch, ISO 180/1eA Unnotch, ISO 180/1eU	2.65 kj/m2 5.99 kj/m2
15	Thermal Expansion Coefficient	ISO 11359 - Determination of Linear Thermal Expansion Coefficient	-20C ~ 20C : 0.0425µm/mm/C 30C ~ 70C : 0.0732µm/mm/C
16	Heat Deflection	ISO 75 - Determination of Heat Deflection Temperature	62 C
17	Water Absorption	ISO 62- Determination of Water Absorption 6 Hrs 32 Hrs 124 Hrs	0.73% 1.12% 1.85%
18	MIE	a&b)BS EN 13821:2001 - Determination of Minimum Ignition Energy (MIE) ARF Material Resysta Compound Sanding Dust	30mJ to 100 mJ > 1000 mJ > 1000 mJ
19	Termite Test	ASTM D3345-08 - Termite Resistance Test	Highly durable againt termite attack
20	Food Safety Test	European Commision Regulation	Pass
21	Solor Reflectance Index	a & b) SRI	Low Wind = 39.4 Medium Wind = 39.83 High Wind = 40.22 SRI = 29
22	Radiation	ASTM E648 - radiant flux	1.03 w/cm2