

FLAMABILITY TEST COMPARISON

Coconut Coir, Jute and Terra Lana Wool weedmattings were subjected to the same flame. The coconut and jute mats ignited and burned, the Terra Lana wool mat smoldered and self-extinguished. Wool is renowned for its flame-resistant properties.



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TERRA LANA WOOL
DAGMAT

Standard AS/NZS 60695.11.5:2005 Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

Test report

Report Number.....: 8094
 Date of issue.....: 08/11/2018
 Total number of pages.....: 7

Product

Brand.....: Terra Lana
 Type.....: Terra Mulch R500

Client information

Client.....: Terra Lana Products Limited
 Address.....: PO Box 19755 Woolston Christchurch 8241 New Zealand
 Order/Reference.....: Email dated 29/10/2018

Testing Laboratory

Name.....: Spectrum Laboratories Ltd
 Address.....: 1/25 Highbrook Drive, East Tamaki, Auckland 2013,
 New Zealand
 Contact information.....: Phone (+64) 9 271 1616

Standard Specification

Standard(s).....: AS/NZS 60695.11.5:2005

Instructions

(Refer to Technical Notes section for additional information)

Scope of assessment.....: Partial

Summary

The sample Terra Lana Model Terra Mulch R500 Insulation complied with the requirements of the Standard AS/NZS 60695.11.5:2005.

Tested by (name + signature).....: *Ms. K. Ramos*
 Compliance Engineer



Approved by (name + signature) ...: *Mr. J. Liu*
 Approved Signatory



AS/NZS 60695.11.5:2005			
Clause	Requirement - Test	Result - Remark	Verdict
6	TEST SPECIMEN		Complied
	If possible, the test specimen shall be a complete equipment, sub-assembly or component.		Complied
	if it is necessary to take away parts of an enclosure or to cut off a suitable part to perform the test, care shall be taken to ensure that the test conditions are not significantly different from those occurring in normal use with regard to shape, ventilation conditions, effect of thermal stresses and possible flames occurring, or burning or glowing particles falling in the vicinity of the test specimen.		Not Relevant
	If the test specimen is a suitable part cut from a larger unit, care shall be taken to ensure that in this particular case the test flame is not applied incorrectly, for example to an edge created by cutting.		Noted
7	SEVERITIES		Complied
	Preferred values of duration of application (t_a) of test flame are as follows:		Complied
	- 5 s, 10 s, 20 s, 30 s, 60 s, 120 s.	<i>Tested at 30 s, 60 s, and 120 s duration.</i>	Complied
8	CONDITIONING		Complied
	The test specimen, the wooden board and the tissue paper shall be conditioned for not less than 24 h in an atmosphere having a temperature between 15 °C and 35 °C and a relative humidity between 45 % and 75 % before starting the test.	<i>Condition at 15-35°C, 45-75% RH.</i>	Complied
9	TEST PROCEDURE		Complied
9.1	Position of test specimen		Noted
	Unless otherwise specified in the relevant specification, the test specimen is arranged in a position of normal use such that ignition is most likely to occur during the test.		Noted

AS/NZS 60695.11.5:2005

Clause	Requirement - Test	Result - Remark	Verdict
	The means to fix the test specimen shall not influence the effect of the test flame or the propagation of flames in a way other than that occurring under normal conditions of use.		Noted
9.2	Application of needle-flame		Complied
	The test flame is applied to that part of the surface of the test specimen which is most likely to be affected by flames resulting from normal use or from fault conditions.		Complied
	The duration of application of the test flame shall be as specified in the relevant specification.	<i>30 s, 60 s, and 120 s duration.</i>	Complied
	The test flame is positioned so that the tip of the flame is in contact with the surface of the test specimen. The test flame is removed after the specified time.	<i>Test flame was removed after the specified time.</i>	Complied
	If the test specimen drips molten or flaming material during the application of the flame, the burner may be tilted up to 45 ° from the vertical to prevent material from dripping into the burner tube while maintaining an 8 mm ± 1 mm spacing between the centre of the top of the burner and the remaining portion of the test specimen, ignoring any strings of molten material.	<i>No dripping of molten or flaming material during test.</i>	Not Relevant
	When required by the relevant specification, the test is applied at more than one point on the same test specimen, in which case care shall be taken to ensure that any deterioration caused by previous tests will not affect the result of the test to be conducted.		Not Relevant
9.3	Number of test specimens		Not Relevant
	Unless otherwise specified in the relevant specification, the test is performed on three test specimens.		Not Relevant
10	OBSERVATIONS AND MEASUREMENTS		Complied
	In the case of ignition of the test specimen and/or the specified layer and/or the surrounding parts, the duration of burning (tb) is measured and reported.	<i>No ignition during test.</i>	Complied

AS/NZS 60695.11.5:2005			
Clause	Requirement - Test	Result - Remark	Verdict
	Duration of burning denotes the time interval from the moment the test flame is removed from the test specimen, until the last flames have extinguished and the glowing of the test specimen, the specified layer and/or the surrounding parts is no longer visible.		Not Relevant
11	EVALUATION OF TEST RESULTS		Complied
	Unless otherwise prescribed in the relevant specification, the test specimen is considered to have satisfactorily withstood the needle-flame test if one of the following situations applies:		Complied
	There is no flame and no glowing of the test specimen and no ignition of the specified layer or wrapping tissue.	<i>See appended table.</i>	Complied
	Flames or glowing of the test specimen and the surrounding parts extinguish within 30 s after the removal of the needle-flame, that is $t_b < 30$ s. Also, the surrounding parts have not burnt away completely and there has been no ignition of the specified layer or wrapping tissue.		Not Relevant



Resistance to fire results table:

The standard used for needle-flame testing was AS/NZS 60695.11.5.

Number of Specimen	1	2	3
Tested item	Insulation	Insulation	Insulation
Material	Wool with jute reinforcing	Wool with jute reinforcing	Wool with jute reinforcing
Colour	Brown	Brown	Brown
Test specimen	SC	SC	SC
Number of samples tested	1	1	1
24 h Conditioning of samples	15-35 °C		
	45-75% RH		
Duration of application (t _a) (s)	30	60	120
Observations			
Duration from application to ignition of the sample (t _i) (s)	2	2	1
Duration from beginning of application to when flames extinguish (t _e) (s)	15, SE	15, SE	13, SE
Degree of specimen distortion	SS	SS	SS
Scorching of pinewood board	No	No	No
Evaluation Criteria			
Visible flame or sustained glowing	NI	NI	NI
Duration of flaming or glowing after flame removal (s)	NA	NA	NA
Surrounding parts burned away completely	No	No	No
Ignition of tissue paper	No	No	No
RESULTS	Complied	Complied	Complied

Legend

SA	Sub Assembly	CE	Complete Equipment	SC	Separate component
ME	Manually extinguished	SE	Self Extinguished	WP	Sample penetrated no ignition
NA	Not applicable	NI	No ignition	SD	Specimen distorted
FS	Flame short duration	EBD	Emitted burning droplets	PM	Penetration limited by metal
TP	Thermoplastic	TS	Thermoset plastic	SS	Specimen scorched

Photographs: Terra Lana Model Terra Mulch R500 Insulation



Test Specimen



Part Subjected to Test Flame



Measurement Uncertainty:

The recorded measurement uncertainties apply to all measurements within this test report unless otherwise specified.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with IANZ requirements.

Measureand (X)	Calibrated Range	Measurement Uncertainty
Voltage (AC/DC)	$X \leq 1 \text{ V}$	$\pm 3.5\%$
	$1 \text{ V} < X \leq 600 \text{ V}$	$\pm 4.5\%$
	$600 \text{ V} < X \leq 3 \text{ kV}$	$\pm 5\%$
	$3 \text{ kV} < X \leq 7.5 \text{ kV}$	$\pm 5\%$
	$10 \text{ kV} < X \leq 20 \text{ kV}$	$\pm 5\%$
Current (AC/DC)	$X \leq 1 \text{ A}$	$\pm 2\%$
	$1 \text{ A} < X \leq 10 \text{ A}$	$\pm 2.5\%$
	$10 \text{ A} < X \leq 20 \text{ A}$	$\pm 1.5\%$
Frequency	$X \leq 100 \text{ Hz}$	$\pm 0.2\%$
	$100 \text{ Hz} < X \leq 100 \text{ kHz}$	$\pm 0.1\%$
Power	$X \leq 12 \text{ kW}$	$\pm 1\%$
Temperature	$X \leq 50 \text{ }^\circ\text{C}$	$\pm 2 \text{ }^\circ\text{C}$
	$50 \text{ }^\circ\text{C} < X \leq 990 \text{ }^\circ\text{C}$	$\pm 5 \text{ }^\circ\text{C}^*$
Resistance	$X \leq 100 \text{ } \Omega$	$\pm 2\%$
	$100 \text{ } \Omega < X \leq 10 \text{ k}\Omega$	$\pm 1.5\%$
	$10 \text{ k}\Omega < X \leq 10 \text{ M}\Omega$	$\pm 2.5\%$
Mass	$X \leq 210 \text{ g}$	$\pm 0.1\%$
	$210 \text{ g} < X \leq 300 \text{ g}$	$\pm 0.010 \text{ kg}$
	$0.3 \text{ kg} < X \leq 60 \text{ kg}$	$\pm 0.012 \text{ kg}$
Length	$X \leq 200 \text{ mm}$	$\pm 0.06 \text{ mm}$
	$200 \text{ mm} < X \leq 1000 \text{ mm}$	$\pm 3 \text{ mm}$
Force	$X \leq 200 \text{ N}$	$\pm 1.5\%$
	$200 \text{ N} < X \leq 1000 \text{ N}$	$\pm 1\%$
Velocity	$X \leq 1000 \text{ rpm}$	$\pm 0.1\%$
	$1000 \text{ rpm} < X \leq 30000 \text{ rpm}$	$\pm 0.1\%$

*Error is linear, $\pm 5 \text{ }^\circ\text{C}$ denotes maximum uncertainty with respect to 990 $^\circ\text{C}$ reading.

Job Number.....: 7210B
Client.....: Terra Lana Ltd.
Address.....: 55 Francella Street, Bromley, PO Box 19755,
Christchurch 8241, New Zealand
Standard(s).....: AS/NZS 60695.11.5:2005
Product.....: Coconut Coir Matting Insulation (450gsm)

Summary of the report

The test specimen was subjected to needle flame for 30s as per the standard. The flames and glowing of the test specimen did not extinguish within 30s after the removal of the needle flame. The surrounding parts burnt and the flame had to be extinguished manually after 120s.

Verdict: Non-compliance

Photographs: Terra Lana Insulation



Figure: Terra Lana Coconut Coir Matting Insulation



Specimen after test

**Resistance to fire record sheet
(Needle-flame)**
Job No. 7210
Date: 29/11/18

The standard used for needle-flame testing was AS/NZS 60695.11.5.

Number of Specimen	1		
Tested item	Insulation		
Material	Coconut Coir Matting		
Colour	brown		
Test specimen	SC		
Number of samples tested	1		
24 h Conditioning of samples		15-35 °C	
		45-75% RH	
Duration of application (t _a) (s)	30		
Observations			
Duration from application to ignition of the sample (t _i) (s)	< 1		
Duration from beginning of application to when flames extinguish (t _e) (s)	760, ME		
Degree of specimen distortion	SS		
Scorching of pinewood board	No		
Evaluation Criteria			
Visible flame or sustained glowing	Yes		
Duration of flaming or glowing after flame removal (s)	730		
Surrounding parts burned away completely	Yes		
Ignition of tissue paper	No		
RESULTS	Did not comply		

Legend

SA	Sub Assembly	CE	Complete Equipment	SC	Separate component
ME	Manually extinguished	SE	Self Extinguished	WP	Sample penetrated no ignition
NA	Not applicable	NI	No ignition	SD	Specimen distorted
FS	Flame short duration	EBD	Emitted burning droplets	PM	Penetration limited by metal
TP	Thermoplastic	TS	Thermoset plastic	SS	Specimen scorched

Note: Needle flame height adjusted to 12mm (±1) in vertical position, test then applied at an angle of 45° to the vertical surface of the test specimen (refer AS/NZS 60695.11.5:2005 Figure 1).

Job Number.....: 7210A
Client.....: Terra Lana Ltd.
Address.....: 55 Francella Street, Bromley, PO Box 19755,
Christchurch 8241, New Zealand
Standard(s).....: AS/NZS 60695.11.5:2005
Product.....: Jute Matting Insulation (300gsm)

Summary of the report

The test specimen was subjected to needle flame for 30s as per the standard. The flames and glowing of the test specimen did not extinguish within 30s after the removal of the needle flame. The surrounding parts burnt and the flame had to be extinguished manually after 120s.

Verdict: Non-compliance

Photographs: Terra Lana Jute Matting Insulation

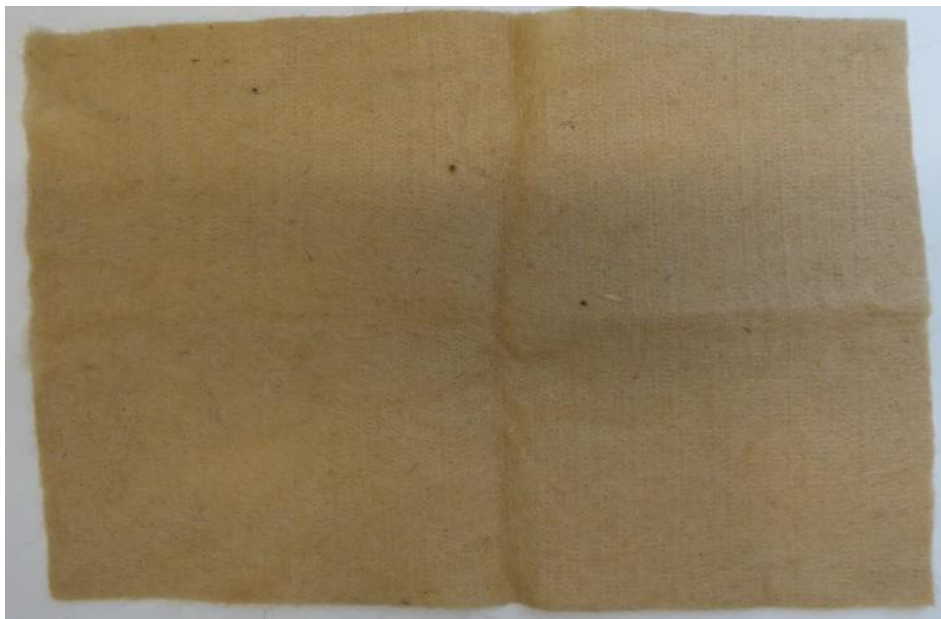


Figure: Terra Lana Jute Matting Insulation

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Test Setup



Specimen after test

**Resistance to fire record sheet
(Needle-flame)**
Job No. 7210
Date: 29/11/18

The standard used for needle-flame testing was AS/NZS 60695.11.5.

Number of Specimen	1		
Tested item	Insulation		
Material	Jute Matting		
Colour	brass		
Test specimen	SC		
Number of samples tested	1		
24 h Conditioning of samples		15-35 °C	
		45-75% RH	
Duration of application (t _a) (s)	30		
Observations			
Duration from application to ignition of the sample (t _i) (s)	< 1		
Duration from beginning of application to when flames extinguish (t _e) (s)	760, ME		
Degree of specimen distortion	SS		
Scorching of pinewood board	No		
Evaluation Criteria			
Visible flame or sustained glowing	Yes		
Duration of flaming or glowing after flame removal (s)	730		
Surrounding parts burned away completely	Yes		
Ignition of tissue paper	No		
RESULTS	Did not comply		

Legend

SA	Sub Assembly	CE	Complete Equipment	SC	Separate component
ME	Manually extinguished	SE	Self Extinguished	WP	Sample penetrated no ignition
NA	Not applicable	NI	No ignition	SD	Specimen distorted
FS	Flame short duration	EBD	Emitted burning droplets	PM	Penetration limited by metal
TP	Thermoplastic	TS	Thermoset plastic	SS	Specimen scorched

Note: Needle flame height adjusted to 12mm (±1) in vertical position, test then applied at an angle of 45° to the vertical surface of the test specimen (refer AS/NZS 60695.11.5:2005 Figure 1).