PAB08

LYSAGHT PRODUCT ADVISORY BULLETIN

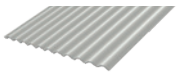
JULY 2024 | This version supersedes all previous issues.

FLAMMABILITY OF LYSAGHT® STEEL PRODUCTS

SCOPE

Flammability of LYSAGHT® steel building products including roofing, walling, structural and rainwater goods manufactured from COLORBOND® steel, ZINCALUME® steel or galvanised steel from BlueScope.

THE LYSAGHT® STANDARD ROOFING RANGE*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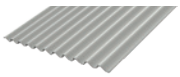
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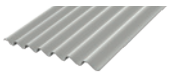
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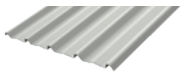
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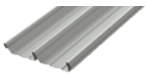
SPANDEK®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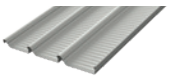
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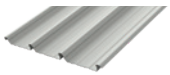
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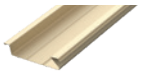
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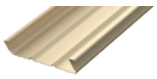
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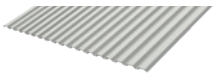
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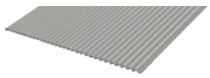
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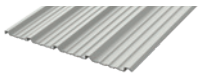
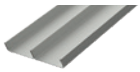

MULTICLAD®

THE LYSAGHT ZENITH® ROOFING RANGE*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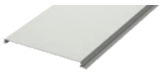
(Not Tapered)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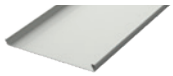
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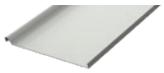
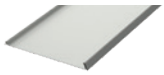
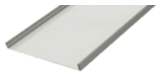

BAROQUE™


ENSEAM®


SNAPSEAM™

*Not all products available in all regions. Please check product availability on www.lysaght.com or with your nearest Lysaght branch.

CONTEXT

Fire performance is a common query about the LYSAGHT® range of steel building products. The data presented in this bulletin has been compiled to provide designer's, builder's, installers, and users basic information on the fire resistance properties of LYSAGHT® steel products.

AUSTRALIAN NATIONAL CONSTRUCTION CODE

The Australian National Construction Code (NCC) 2022 sets out criteria for the determination of Non Combustible materials at:

C2D10 NON-COMBUSTIBLE BUILDING ELEMENTS CLAUSE C2D10 (5)

The following materials, when entirely composed of itself, are non-combustible and may be used wherever a non-combustible material is required:

(b) Steel, including metallic coated steel.

And;

CLAUSE C2D10 (6)

The following materials may be used wherever a non-combustible material is required:

(e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.

BLUESCOPE TESTING

BlueScope has commissioned CSIRO to undertake a comprehensive range of testing to determine the Flammability of various permutations of COLORBOND® steel, ZINCALUME® steel and galvanised steel material. These tests have been conducted in accordance with AS/NZS 1530.3. The results of this testing are summarised at Table 1.

Table 1:

Product	Test Cert	Australian standard	Ignitability Index[1] (0-20)	Spread of Flame Index[2] (0-10)	Heat Evolved Index[3] (0-10)	Smoke Developed Index[4] (1-10)
0.42mm to 0.48mm BMT ZINCALUME® steel	FNE12824	AS/NZS 1530.3	0	0	0	0-1
0.48mm BMT TRUECORE® steel	FNE12825	AS/NZS 1530.3	0	0	0	0-1
0.42mm BMT COLORBOND® steel	FNE12809	AS/NZS 1530.3	0	0	0	0-1
0.62mm TCT COLORBOND® Metallic steel (PE)	FNE12924	AS/NZS 1530.3	0	0	0	1
0.77mm TCT COLORBOND® Metallic steel (PVDF)	FNE12925	AS/NZS 1530.3	0	0	0	0-1

Explanation of four indices are assigned to materials tested to AS/NZS 1530.3

1. Ignitability Index – a measure of the tendency for the gaseous pyrolysis products to be ignited during the test. Materials are rated from zero to 20, with materials that do not ignite having an index of zero.
2. Spread of Flame Index – a measure of the rate of radiant heat release once a material has ignited. Materials are rated on a scale of zero to 10. The maximum spread of flame index is 10, and the minimum zero.
3. Heat Evolved Index - is a measure of the quantity of radiant heat released by the test material in a specified time interval after ignition. Materials are rated on a scale of zero to 10, with increasing indices indicating increasing quantities of radiant heat evolution.
4. Smoke Developed Index - relates to the maximum optical density of the smoke produced during the test. The index has a range of zero to 10, with each increase of one index unit indicating a doubling in the optical density of the smoke produced.
5. 4.38mm Nom. BMT low carbon steel manufactured by BlueScope Steel Australia is tested to AS 1530.1. The material is not deemed combustible according to test criteria specifed in Clause 3.4 of AS 1530.1-1994.

CONCLUSION

As a result of this testing we are able to determine that LYSAGHT® products manufactured from BlueScope's COLORBOND® steel, ZINCALUME® steel or galvanised steel materials all have a Spread-of-Flame index of 0 (zero) and as such are considered non-combustible materials in accordance with the National Construction Code clauses C2D10 (5) (b) and C2D10 (6) (e).

Additional information in relation to use of COLORBOND® steel products in bush fire prone areas may be sourced from the BlueScope fact file steel cladding details for bushfire-prone construction at:
www.bluescopesteel.com.au/tools-and-resources/bushfire-design

IMPORTANT NOTE:

When considering the information presented in this bulletin it is important to understand the difference between "flammability" and "fire rating".

Flammability is a measure of how easily a specific material ignites or sustains a combustion reaction.

Fire ratings are applied to complete systems and not to individual materials or components of the system. Fire ratings, or Fire Resistance Level (FRL) refer to the fully constructed system's ability to withstand structural failure, prevent the spread/penetration of flames and ability to insulate interior elements from maximum specified temperatures. It is often expressed in minutes without failure for each of the three elements i.e. 60/60/60, -/120/120 anywhere from 30 minutes up to 240 minutes.

National Construction Code:

The National Construction Code (NCC) is an initiative of the Council of Australian Governments (COAG) developed to incorporate all on-site construction requirements into a single code. The NCC comprises the Building Code of Australia (BCA), Volumes One and Two; and the Plumbing Code of Australia (PCA), as Volume Three.

Certificate of Test

QUOTE No.: NE8582 **REPORT No.: FNE12824**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope ZINCALUME (R) Steel

SPONSOR: BlueScope Steel Limited
Innovation Labs, Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a coated low carbon steel sheet. The coating was comprised of an aluminium-zinc-magnesium alloy, corrosion resistant film, and organic resin coating on both sides.

Nominal thickness of steel sheet:	0.42 mm to 0.48 mm
Nominal thickness of aluminium-zinc-magnesium coating:	30 µm
Nominal thickness of corrosion resistant layer:	1 µm
Nominal thickness of organic resin coating:	3 µm
Nominal total thickness:	0.51 mm
Nominal total mass:	3.93 kg/m^2
Nominal total density:	7850 kg/m^3
Colour:	light grey (observed on facing and backing)

TEST PROCEDURE: Six (6) samples were tested in accordance with AS/NZS 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m^2)	N/A	N/A
Smoke Release ($\log_{10}$D)	-5.461	0.877

For regulatory purposes these figures correspond to the following indices:

Ignitability Index	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
0	0	0	0 - 1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 25 October 2021

Issued on the 21st day of December 2021 without alterations or additions.

Faustin Molina
Testing Officer

Stephen Smith
Team Leader, Reaction to Fire Laboratory

End of Report

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 – Testing.

CSIRO INFRASTRUCTURE TECHNOLOGIES

14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

QUOTE No.: NE8582 **REPORT No.: FNE12825**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope TRUECORE (R) Steel

SPONSOR: BlueScope Steel Limited
Innovation Labs, Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a coated low carbon steel sheet. The coating was comprised of an aluminium-zinc-magnesium alloy, corrosion resistant film, and blue tinted organic resin coating on both sides.

Nominal thickness of steel sheet:	0.48 mm
Nominal thickness of aluminium-zinc-magnesium coating:	35 µm
Nominal thickness of corrosion resistant layer:	1 µm
Nominal thickness of organic resin coating:	3 µm
Nominal total thickness:	0.51 mm
Nominal total mass:	3.93 kg/m^2
Nominal total density:	7850 kg/m^3
Colour:	blue (facing) / blue (backing)

TEST PROCEDURE: Six (6) samples were tested in accordance with AS/NZS 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m^2)	N/A	N/A
Smoke Release ($\log_{10}$D)	-3.270	0.725

For regulatory purposes these figures correspond to the following indices:

Ignitability Index	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
0	0	0	0 - 1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 27 October 2021

Issued on the 21st day of December 2021 without alterations or additions.

Faustin Molina
Testing Officer

Stephen Smith
Team Leader, Reaction to Fire Laboratory

End of Report

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 – Testing.

CSIRO INFRASTRUCTURE TECHNOLOGIES
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

QUOTE No.: NE8566 **REPORT No.: FNE12809**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope COLORBOND Steel

SPONSOR: BlueScope Steel Limited
Innovation Labs, Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a polyester painted steel sheet with aluminium-zinc-magnesium alloy coating on both sides.

Nominal thickness of steel sheet:	0.42 mm
Nominal thickness of aluminium-zinc-magnesium coating:	30 µm
Nominal thickness of paint layer:	35 µm
Nominal total thickness:	0.50 mm
Nominal total mass:	3.4 kg/m^2
Nominal total density:	7700 kg/m^3
Colour:	windspray (facing) / shadow grey (backing)

TEST PROCEDURE: Six (6) samples were tested in accordance with AS/NZS 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m^2)	N/A	N/A
Smoke Release ($\log_{10}$D)	-3.051	0.786

For regulatory purposes these figures correspond to the following indices:

Ignitability Index	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
0	0	0	0 - 1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 21 September 2021

Issued on the 21st day of October 2021 without alterations or additions.

Faustin Molina
Testing Officer

Stephen Smith
Team Leader, Reaction to Fire Laboratory

End of Report

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 – Testing.

CSIRO INFRASTRUCTURE TECHNOLOGIES
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

QUOTE No.: NE8641 **REPORT No.: FNE12924**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope COLORBOND Metallic steel (PE)

SPONSOR: BlueScope Steel Limited
Innovation Labs, Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a polyester painted steel sheet with aluminium-zinc-magnesium coating on both sides, comprised of the following layers:

Layer 1: 33-µm thick paint comprised of polyester top coat and polyester primer;
Layer 2: < 1-µm thick conversion coating;
Layer 3: 30-µm thick aluminium-zinc-magnesium coating;
Layer 4: 0.55-mm thick steel sheet;
Layer 5: 30-µm thick aluminium-zinc-magnesium coating;
Layer 6: < 1-µm thick conversion coating;
Layer 7: 10-µm thick paint comprised of polyester backing coat and polyester primer.

Nominal total thickness: 0.62 mm
Nominal total mass: 4.42 kg/m²
Nominal total density: 7700 kg/m³
Colour: cosmic (face) / shadow grey (backing)

The test result only relates to the specimen tested and described in this report. CSIRO was not involved in the selection of the materials.

TEST PROCEDURE: Six (6) samples were tested in accordance with AS/NZS 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m²)	N/A	N/A
Smoke Release ($log_{10}D$)	-2.105	0.111

For regulatory purposes these figures correspond to the following indices:

Ignitability Index	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
0	0	0	1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 25 May 2022

Issued on the 4th day of July 2022 without alterations or additions.

Faustin Molina
Testing Officer

Stephen Smith
Team Leader, Reaction to Fire Laboratory

End of Report

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
Accredited for compliance with ISO/IEC 17025 – Testing.

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14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555 www.csiro.au

Certificate of Test

QUOTE No.: NE8641 **REPORT No.: FNE12925**

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE

TRADE NAME: BlueScope COLORBOND Metallic steel (PVDF)

SPONSOR: BlueScope Steel Limited
Innovation Labs, Old Port Road
PORT KEMBLA NSW 2505
AUSTRALIA

DESCRIPTION OF SAMPLE: The sponsor described the tested specimen as a painted steel sheet with aluminium-zinc-magnesium coating on both sides, comprised of the following layers:

Layer 1: 25-µm thick paint comprised of polyvinylidene fluoride (PVDF) top coat and polyester primer;
Layer 2: < 1-µm thick conversion coating;
Layer 3: 30-µm thick aluminium-zinc-magnesium coating;
Layer 4: 0.70-mm thick steel sheet;
Layer 5: 30-µm thick aluminium-zinc-magnesium coating;
Layer 6: < 1-µm thick conversion coating;
Layer 7: 10-µm thick paint comprised of polyester backing coat and polyester primer.

Nominal total thickness: 0.77 mm
Nominal total mass: 5.60 kg/m²
Nominal total density: 7700 kg/m³
Colour: citi (face) / foam grey (backing)

The test result only relates to the specimen tested and described in this report. CSIRO was not involved in the selection of the materials.

TEST PROCEDURE: Six (6) samples were tested in accordance with AS/NZS 1530, Method for fire tests on building components and structures, Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release, 1999. For the test, each sample was clamped to the specimen holder in four places.

RESULTS: The following means and standard errors were obtained:

Parameter	Mean	Standard Error
Ignition Time (min)	N/A	N/A
Flame Spread Time (s)	N/A	N/A
Heat Release Integral (kJ/m²)	N/A	N/A
Smoke Release ($log_{10}D$)	-2.437	0.191

For regulatory purposes these figures correspond to the following indices:

Ignitability Index	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
0	0	0	0 - 1

The results of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

DATE OF TEST: 30 May 2022

Issued on the 4th day of July 2022 without alterations or additions.

Faustin Molina
Testing Officer

Stephen Smith
Team Leader, Reaction to Fire Laboratory

End of Report

NATA Accredited Laboratory
Number: 165
Corporate Site No 3625
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b) Alter specifications shown in its publications and websites to reflect changes made after the date of publication.

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AUSTRALIAN STANDARDS

Australian Standard	Definition
AS 1530.1-1994	Methods for fire tests on building materials, components and structures, Part 1: Combustibility test for materials
AS/NZS 1530.3:1999	Methods for fire tests on building materials, components and structures Part:3 Simultaneous determination of ignitability, flame propagation, heat release and smoke release (Reconfirmed 2016)

FOR YOUR NEAREST SUPPLIER VISIT:

LYSAGHT.COM

FOR SALES ENQUIRIES CALL 13 30 38
FOR TECHNICAL ENQUIRIES CALL 1800 641 417

LYT0138 - 07/2024