



CSIRO Appraisals, PO Box 56, Graham Road, Highett, Vic. 3190
Tel: (03) 9252 6000 Fax: (03) 9252 6244
E-mail: appraisals@dbce.csiro.au
Web: www.dbce.csiro.au/appraisals

TECHNICAL ASSESSMENT 327

May 2006^{1, 2}

Laserlite Apollo[®], Laserlite XPT[®], Laserlite[®] 2000, Makrolon[®] CS UV & Makrolon[®] Multiwall Polycarbonate Roof Sheeting

1. August 2006. TA 327 amended to include reference to Laserlite Apollo[®], Laserlite XPT[®], Laserlite[®] 2000 and Makrolon[®] CS UV - previously appraised under TA 317.
2. June 2009. Revalidated and valid till 31 December 2009. Applicant name change – previously known as Laserlite Australia Pty Limited.

PURPOSE

A roof cladding material for use on 'open sided' gazebos, carports, patios and similar domestic construction in bushfire prone areas.

APPLICANT

Bayer MaterialScience Pty Ltd (ACN 086 237 765), 17-19 Wangara Road, Cheltenham 3192, Victoria (Manufacturer)

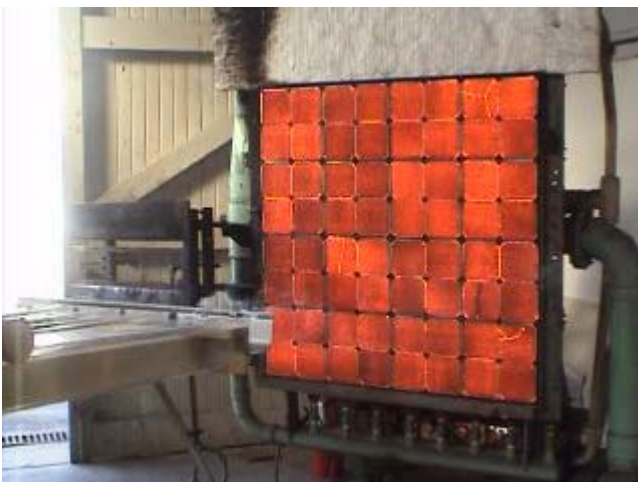


Figure 1.
Radiant heat test on
Laserlite Polycarbonate Roof Sheeting



Figure 2.
Laserlite Polycarbonate Roof Sheeting

TECHNICAL OPINION

In the opinion of CSIRO Appraisals, Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting will satisfy the requirements of Australian Standard 4256.5-2006 (and AS/NZS 4256.5-1996) 'Plastic Roof and wall cladding materials - Polycarbonate' as a suitable roof cladding material for use on 'open sided' gazebos, carports, patios and similar domestic construction in bushfire prone areas, under the following conditions:

1. Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 are installed in accordance with instructions LQPM011 Issue 9 (dated 1 June 2006). Makrolon® Multiwall is installed in accordance with instructions LQPM005 Issue 7 (dated 1 June 2006). Makrolon® CS UV is installed in accordance with LQPM003 Issue 2 (dated 1 March 2006)

Note: These instructions are available from Bayer MaterialScience Pty Ltd (ACN 086 237 765), 17-9 Wangara Road, Cheltenham 3192, Victoria (Phone 03 9581 9888).

2. The Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting is suitable for installation in Level 1, 2 and 3 construction in bushfire-prone areas as defined in AS 3959:1999; and medium, high and extreme bushfire attack categories as defined in the BCA 2009.

Test reports (refer to 'Fire Properties – Test Reports' section) detail testing in accordance with basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test. The test specimens were subjected to up to 60kW/m² received thermal radiation at the front edge of the pergola.

3. The installation of the roof sheeting must be in accordance with Australian Standard 1562.3-2006 (and AS/NZS 1562.3-1996) 'Design and installation of sheet roof and wall cladding - 'Plastic'.

The installation method must pass the resistance to impact test specified in Clause 5.4 (sand bag test in accordance with AS 4040.4-1992 'Methods of testing sheet roof and wall cladding – Resistance to concentrated loads') utilizing/incorporating Roma and Greca profile only (refer to LQPM011 Issue 9 dated 1 June 2006).

Safety mesh must be installed as specified in AS/NZS 1562.3-1996 (and AS 1562.3-2006).

4. Bayer MaterialScience Pty Ltd outlines a number of fixing, flashing and accessories recommended for use in:- Makrolon® Multiwall Polycarbonate Roof Sheeting installation in LQPM005 Issue 7 (dated 1 June 2006); Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 Polycarbonate Roof Sheeting installation in LQPM011 Issue 9 (dated 1/6/06); and Makrolon® CS UV Polycarbonate Roof Sheeting installation in LQPM003 Issue 2 (dated 1 March 2006).
5. For the purpose of this appraisal 'open sided' means a structure that has not less than one third (1/3) of its perimeter open. Open sided is defined in the BCA as having two or more sides open and not less than one third of its perimeter open. For the purposes of this definition, a side is considered to be open if the roof covering adjacent to that side is not less than 500 mm from another building or allotment boundary.
6. Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting can be used in numerous and varied situations, however, this appraisal only considers those applications referred to in the 'Purpose' on Page 1.
7. Do not use silicone sealants as these will damage the sheet and void the warranty; store in direct sunlight; allow moisture to get between sheets in storage as this may cause whitening; or walk directly on sheeting.

BUILDING CODE of AUSTRALIA

In the opinion of CSIRO Appraisals, the systems described in this Technical Assessment and installed under the conditions listed herein will satisfy the performance required of Clause P 2.3.4 (Volume 2 – Class 1 & 10 buildings) of the Building Code of Australia 2009.

Notes:

- (i) The inclusion of this clause with reference to the BCA is aimed at assisting those involved in the design, specifying and building approval/permit process relate the Appraisal to the relevant Performance Requirements of the BCA.
- (ii) Users of this Technical Assessment must review and determine the impact of any amendments made to the BCA including referenced documents after the date of publication of this Technical Assessment.

RELATED INFORMATION

VALIDITY OF THE ASSESSMENT

Condition:

This Technical Assessment applies only to the use of the Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting as described herein.

Withdrawal:

This Technical Assessment will be withdrawn or amended if CSIRO Appraisals considers that a change in design or manufacturing quality renders the basis of the appraisal invalid, or if reported field experience convinces CSIRO Appraisals of unsatisfactory quality or performance.

Term of Validity:

This Technical Assessment is valid until 31 December 2009. Technical Assessments may be amended during the term of validity. Users of this Technical Assessment should verify that it remains valid and is the current version by checking on the CSIRO Appraisals website: <http://www.cmmt.csiro.au/services/appraisals>.

RELEVANT DOCUMENTS

Bayer MaterialScience Pty Ltd Installation instructions LQPM005 Issue 7 (dated 1 June 2006).

Bayer MaterialScience Pty Ltd Installation instructions LQPM011 Issue 9 (dated 1 June 2006).

Bayer MaterialScience Pty Ltd Installation instructions LQPM003 Issue 2 (dated 1 March 2006).

Standards Australia AS/NZS 4256.5-1996 'Plastic Roof and wall cladding materials – Polycarbonate.'

Standards Australia AS 4256.5-2006 'Plastic Roof and wall cladding materials – Polycarbonate.'

Standards Australia AS/NZS 1562.3-1996 'Design and installation of sheet roof and wall cladding - 'Plastic''

Standards Australia AS 1562.3-2006 'Design and installation of sheet roof and wall cladding - 'Plastic''

Building Code of Australia 2009

APPROVED ASSESSMENT EXTRACT

The Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting as distributed by Bayer MaterialScience Pty Ltd (ACN 086 237 765) and its licensees is suitable as a roof cladding material for use on 'open sided' gazebos, carports, patios and similar domestic construction in bushfire prone areas when the conditions of CSIRO Appraisals Technical Assessment 327 are fulfilled.

APPRAISAL

DESCRIPTION

The following description is based on information provided by the applicant.

General:

The Laserlite Polycarbonate Roof Sheeting range of products includes Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall.

Laserlite® 2000 has 3 varieties in either a 'Roma', 'Greca' or 'Trimdek' profile.

1. **Clear** – which consists of polycarbonate resin and UV absorbing cap layer;
2. **Tints** – which consists of polycarbonate resin, UV absorbing cap layer and a transparent colour; and
3. **Colours** – which consists of polycarbonate resin, UV absorbing cap layer, a transparent colour and Titanium Dioxide (TiO₂) as a white pigment.

Laserlite Apollo® has 2 varieties in either a 'Roma' or 'Greca' profile.

1. **Tints** – which consists of polycarbonate resin, UV absorbing cap layer, a transparent colour and metallic particle to give a metallic appearance and heat reflective properties;
2. **Pearls** – which consists of polycarbonate resin, UV absorbing cap layer and pearlescent pigments to provide a translucent pearl effect that also reflects heat.

Laserlite XPT® has 1 variety in either a 'Roma' or 'Greca' profile.

1. **Colours** - This variety consists of polycarbonate resin, UV absorbing cap layer also containing a Titanium Dioxide coated Mica to provide a frosted appearance and selective Infra Red (Heat) reflecting properties.

Makrolon® CS UV, another trade name used for Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 for export markets, is available in 'Roma', 'Greca', 'Trimdek', 'IBR', 'Supaclad' and 'Industrial 7' profiles.

Makrolon® Multiwall Polycarbonate Roof Sheetting is available in 8 mm and 10 mm thickness.

The 8 mm thick product (*700 mm width*) is available in colours including Clear, Bronze Tint, Grey Tint, Opal, Platinum and Steel.

The 8 mm thick product (*1050 mm width*) is available in colours including Clear, Bronze Tint, Grey Tint, Opal, Platinum and Steel.

Standard lengths for 8mm thick products include 1m, 1.5m, 2m, 2.5m, 3m, 3.5m, 4m, 4.5m, 5m, 6m and 9m.

The 10 mm thick product is available in 980 mm width and is available in colours including Clear, Bronze Tint, Grey Tint, Opal, Platinum and Steel.

Standard lengths for 10mm thick products include 1m, 1.5m, 2m, 2.5m, 3m, 3.5m, 4m, 4.5m, 5m, 6m, 7m, 8m and 9m.

DESIGN INFORMATION

General:

Based on information provided by the applicant, Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall is 100% polycarbonate sheeting.

Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheetting can be used as a roof cladding material for use on 'open sided' gazebos, carports, patios and similar domestic construction.

Installation:

Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 are installed in accordance with instructions LQPM011 Issue 9 (dated 1 June 2006). Makrolon® Multiwall is installed in accordance with instructions LQPM005 Issue 7 (dated 1 June 2006). Makrolon® CS UV is installed in accordance with instructions LQPM003 Issue 2 (dated 1 March 2006).

Durability:

Bayer MaterialScience Pty Ltd provides a lifetime warranty on loss of light transmission for Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000. The product will not lose more than 8% of light transmission for the first 10 years and thereafter no more than 1% per year for lifetime from the purchase date (when tested in accordance with ASTM D 1003-2000).

Bayer MaterialScience Pty Ltd provides a 10 year warranty on loss of light transmission for Makrolon® CS UV and Makrolon® Multiwall. The product will not lose more than 10% of light transmission for the first 10 years and thereafter no more than 1% per year for lifetime from the purchase date (when tested in accordance with ASTM D 1003-2000).

Bayer MaterialScience Pty Ltd provides a 5 year warranty on weather breakage for Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall. It is the responsibility of the consumer to obtain a copy of the full warranty conditions. These are available from any Bayer MaterialScience Pty Ltd Australia office.

Maintenance:

Rinse sheet with lukewarm water. Wash with a mild detergent and a soft sponge. Take care not to scratch the sheet.

Note: Bayer MaterialScience Pty Ltd does not recommend the collection of drinking water from any roof without appropriate precautions and filtration. Check with your local water authority for further advice.

BASIS OF APPRAISAL

CSIRO Appraisals has assessed the following aspects in undertaking this appraisal:

- (a) the effectiveness against exposure to radiant heat from bushfires
- (b) installation procedures, and
- (c) durability of the system.

The following documents and inspections were used in carrying out the appraisal.

Manufacturer and Installation Information:

1. Bayer MaterialScience Pty Ltd:

Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 are installed in accordance with instructions LQPM011 Issue 9 (dated 1 June 2006). Makrolon® Multiwall is installed in accordance with instructions LQPM005 Issue 7 (dated 1 June 2006). Makrolon® CS UV is installed in accordance with instructions LQPM003 Issue 2 (dated 1 March 2006).

2. SAI Global Ltd (SAI Global) (ABN 67 050 611 642 286) Sussex St, Sydney, NSW. Certificate of Registration. Certificate # QEC1197 (23 May 2006):

This outlines the Quality Management System of Laserlite Australia Pty Limited. The Quality Management System is in place for the development, manufacture, sale and distribution of extruded plastic sheet products according to AS/NZS ISO 9001:2000.

3. **Laserlite Australia Pty Limited, Cheltenham, VIC:**
Material Safety Data Sheet (MSDS), April 2003 Rev.
4. **SAI Global Limited (SAI Global) (ABN 67 050 611 642 286) Sussex Street, Sydney, NSW.**
StandardsMark Licence. Licence Number SMK1811 (5 July 2007):
This outlines the compliance of Laserlite Australia in regards manufacture of product in accordance with both 1996 and 2006 versions of Australian Standard 4256.5 – Plastic roof and wall cladding materials – Polycarbonate.
5. **Hatton Babaniaris Consulting Structural Engineers, Darwin, NT:**
Design data sheet for Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV including installation instructions for use of product in Darwin Cyclone Area and drawings numbered M133/1 (dated 3 July 2002) and M/133/2 (dated 3 July 2002).
6. **Northern Territory Building Advisory Committee, Darwin, NT:**
Letter dated 13 February 2003, confirming approval for inclusion of Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV product in Northern Territory Deemed to Comply Manual.
7. **SAI Global Limited (SAI Global) (ABN 67 050 611 642 286) Sussex Street, Sydney, NSW.**
StandardsMark Licence. Licence Number 1811 (5 February 2003):
This outlines the compliance of Laserlite Australia in regards manufacture of Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV product in accordance with Standards Australia AS/NZS 4256.5 – Plastic roof and wall cladding materials – Polycarbonate.
4. **AWTA Ltd, Kensington, VIC (NATA Accredited), test report numbered 7-496019-CV (November 2000):**
This report details testing Laserlite XPT corrugated plastic roofing sheet in accordance with AS/NZS 1530.3-1999 'Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release'.
5. **AWTA Ltd, Kensington, VIC (NATA Accredited), test report No. 7-495991-CV (November 2000):**
This report details testing Laserlite 2000 corrugated plastic roofing sheet in accordance with AS/NZS 1530.3-1999 'Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release'.
6. **CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNK 0251 (March 2005):**
This report details testing 10mm thick Makrolon® Multiwall Polycarbonate Roof Sheeting in accordance with AS/NZS 3837:1998 (at 25kW/m² level of irradiance) 'Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter'.
7. **CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNA 0070 (7 September 2004):**
This report details testing Laserlite 2000 in accordance with basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test, issued July 2004.
The test specimen was subjected to approximately 12.5kW/m² received thermal radiation at the front edge of the pergola.

Fire Properties – Test Reports:

1. **AWTA Ltd, Kensington, VIC (NATA Accredited), test report numbered 7-513685-CV (October 2002):**
This report details testing Makrolon® Multiwall Polycarbonate Roof Sheeting product (8 mm thick) in accordance with AS/NZS 1530.3-1999 'Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release'.
2. **AWTA Ltd, Kensington, VIC (NATA Accredited), test report numbered 7-513684-CV (October 2002):**
This report details testing Makrolon® Multiwall Polycarbonate Roof Sheeting product (10 mm thick) in accordance with AS/NZS 1530.3-1999 'Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release'.
3. **AWTA Ltd, Kensington, VIC (NATA Accredited), test report numbered 7-501935-CV (July 2001):**
This report details testing Laserlite Apollo corrugated roofing sheet in accordance with AS/NZS 1530.3-1999 'Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release'.
8. **CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNA 0071 (7 September 2004):**
This report details testing Laserlite 2000 in accordance with basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test, issued July 2004. The test specimen was subjected to a peak of approximately 31kW/m² received thermal radiation and a minimum of 12.5kW/m² received thermal radiation at the front edge of the pergola.
9. **CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNA 0077 (7 September 2004):**
This report details testing Laserlite 2000 in accordance with basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test, issued July 2004. The test specimen was subjected to a peak of approximately 40kW/m² received thermal radiation and a minimum of 12.5kW/m² received thermal radiation at the front edge of the pergola.

10. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNA 0078 (7 September 2004):

This report details testing Laserlite 2000 in accordance with basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test, issued July 2004. The test specimen was subjected to a peak of approximately 60kW/m² received thermal radiation and a minimum of 12.5kW/m² received thermal radiation at the front edge of the pergola.

11. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNK 0191 (October 2004):

This report details testing Laserlite Apollo in accordance with AS/NZS 3837:1998 (at 25kW/m² level of irradiance) 'Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.

12. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, test report FNK 0190 (October 2004):

This report details testing Laserlite XPT in accordance with AS/NZS 3837:1998 (at 25kW/m² level of irradiance) 'Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.

Note: Information provided by the Applicant indicates that Makrolon® Multiwall Polycarbonate Roof Sheeting is a similar product to that of Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 & Makrolon® CS UV Polycarbonate Roof Sheeting (Makrolon® Multiwall is a twin wall polycarbonate and Laserlite is a single wall polycarbonate).

Based on this information and results from tests reported under Fire Properties – Test Reports (Points 6 – 10), it is the opinion that Makrolon® Multiwall Polycarbonate Roof Sheeting would achieve the same results as Laserlite Apollo, XPT, 2000 & Makrolon® CS UV Polycarbonate Roof Sheeting if tested to the basic principles of WFRA Standard FES025 C Version 2: Performance of External Construction Elements Subjected to Simulated Bushfire Attacks, Part C: Radiant Heat Test, issued July 2004.

Overseas Classifications and Testing:

1. Laboratoire Central (Prefecture De Police), Paris, France. Classification Report 404/04 (4 October 2004)

M1 Classification for Laserlite Polycarbonate roof sheeting materials in accordance with the Clause 3 of the Decree 2 issued by the French Internal Ministry on 21st November 2002 (official journal date of 31 December 2002). The Classification relates to rigid building materials or materials deemed rigid and their fire spread characteristics. The Classification is conducted in accordance with the Classification requirements of NF P 92-507 which require testing in accordance with: - Heat radiation test in accordance with NF P 92-501; Test for meltable materials in accordance with NF P 92-505; Speed of flame propagation test in accordance with NF P 92-504; Durability tests in accordance with NF P 92-512; and Multilayered materials radiation test in accordance with NF P 92-507.

Structural Properties – Test Reports:

1. Sigma Energy Solutions, Murarrie Qld, Technical Report numbered SJ 28/15/02 (September 2003):

This report details testing Makrolon® Multiwall Polycarbonate Roof Sheeting 8mm thick 700 mm wide 'Opal' colour in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Metal Purlins).

2. Sigma Energy Solutions, Murarrie Qld, Technical Report numbered SJ 28/15/01 (September 2003):

This report details testing Makrolon® Multiwall Polycarbonate Roof Sheeting 10mm thick 980 mm wide 'Opal' colour in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Metal Purlins).

3. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, test report numbered PDR 04/028 (May 2004)

This report details testing Laserlite Polycarbonate Roof Sheeting in accordance with Sections 10.1, 10.2 and 10.3 of AS 4256.5:1996. The product met the requirements for Sections 10.1, 10.2 and 10.3 of AS 4256.5:1996.

4. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered BCE Doc 01/282 (August 2001)

This report details testing Laserlite Apollo (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Metal Purlins).

5. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered BCE Doc 01/285 (August 2001)

This report details testing Laserlite Apollo (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Wooden Purlins).

6. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered BCE Doc 01/283 (August 2001)

This report details testing Laserlite Apollo (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Metal Purlins).

- 7. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered BCE Doc 01/284 (August 2001)**
This report details testing Laserlite Apollo (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Wooden Purlins).
- 8. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered PDA 00/048B (January 2001)**
This report details testing Laserlite XPT (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Wooden Purlins).
- 9. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered PDA 00/048C (January 2001)**
This report details testing Laserlite XPT (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Wooden Purlins).
- 10. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered PDA 00/048D (January 2001)**
This report details testing Laserlite XPT (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Steel Purlins).
- 11. CSIRO Manufacturing & Infrastructure Technology, Highett, VIC, Certificate of Test numbered PDA 00/048E (January 2001)**
This report details testing Laserlite XPT (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Steel Purlins).
- 12. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, Certificate of Test numbered CZ56BTS2922 (October 1999)**
This report details testing Laserlite 2000 (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Steel Purlins).
- 13. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, Certificate of Test numbered CZ56BTS2922 (October 1999)**
This report details testing Laserlite 2000 (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Steel Purlins).
- 14. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, Certificate of Test numbered CZ56BTS2922 (October 1999)**
This report details testing Laserlite 2000 (Roma profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Timber Frames).
- 15. CSIRO Manufacturing & Infrastructure Technology, North Ryde, NSW, Certificate of Test numbered CZ56BTS2922 (October 1999)**
This report details testing Laserlite 2000 (Greca profile) in accordance with AS/NZS 4040.4:1996 'Sandbag Impact Testing' (using Timber Frames).

- 16. Allunga Exposure Laboratory, Townsville Queensland 4810, Exposure Report (5th November 2004):** This report provides a 4 year report on the performance of the Laserlite system.

Note: Information provided by the Applicant indicates that Makrolon ® Multiwall Polycarbonate Roof Sheeting is a similar product to that of Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000 & Makrolon ® CS UV Polycarbonate Roof Sheeting (Makrolon ® Multiwall is a twin wall polycarbonate and Laserlite is a single wall polycarbonate). Based on this information and results from tests reported under Structural Properties – Test Reports (Point 14), it is the opinion that Makrolon ® Multiwall Polycarbonate Roof Sheeting would achieve the same results as Laserlite Apollo, XPT, 2000 & Makrolon ® CS UV Polycarbonate Roof Sheeting if tested for exposure.

Exposure tests outdoors are the only reliable means of obtaining information about the durability of materials in terms of their continuing satisfactory performance. Such testing takes a long time. CSIRO Appraisals does not consider it warranted to await results from such tests before issuing an Appraisal based on laboratory assessments, inspections and the history of completed installations. Interim results of Allunga tests conducted on Makrolon ® Multiwall Polycarbonate Roof Sheeting will be considered during the review of the Technical Assessment.

- 17. CSIRO Appraisals, PO Box 56, Highett, Victoria, 3190. Technical Assessment 317 'Laserlite Apollo, XPT, 2000 & Makrolon ® CS UV Polycarbonate Roof Sheeting (May 2005):** Information included in the appraisal of 'Laserlite Apollo, XPT, 2000 & Makrolon ® CS UV Polycarbonate Roof Sheeting previously described in Technical Assessment 317 has been incorporated into TA 327.

Inspections:

CSIRO Appraisals representatives have inspected installations of the systems and found the level of performance satisfactory.



Kenneth KJ Lofhelm
CSIRO Appraisals



CSIRO Appraisals is a project of CSIRO Manufacturing and Infrastructure Technology providing a range of assessment products including:

- Technical Assessments – appraisals of innovative products, systems or materials that may or may not be covered by Australian Standards or building regulations.
- Interim Reports – appraisals of products that have not yet reached the fully developed or manufacturing phase. They aid with product development and may be used as a step towards a subsequent Technical Assessment.
- Certification Assessments – appraisals of products, systems or materials solely against the requirements of the BCA and used for gaining approval from Federal or State authorities.

From 1978, under the auspices of the Australian Building Systems Appraisal Council (ABSAC), CSIRO ran an appraisal service in conjunction with the Australian Institute of Building Surveyors, the Housing Industry Association, the Insurance Council of Australia and the Master Builders Association. In 1999, CSIRO Appraisals was formed to continue the business of ABSAC under the sole patronage of CSIRO. This new scheme retains the committee structure of technical and interstate advisers that operated as ABSAC. All past ABSAC publications and appraisals are being continued and supported by CSIRO Appraisals.

CSIRO Appraisals is a founding member of the World Federation of Technical Assessment Organizations

Technical Assessments are intended to help all those concerned with the approval, specification and use of new

products or systems. They are objective assessments of the product, system or material but are not approvals or endorsements. They may be submitted to approval authorities as part of the justification process required to obtain approval.

Each Technical Assessment has been prepared by CSIRO Appraisals and then reviewed, revised and finally endorsed by the Technical Advisory Committee (TAC), detailed below. CSIRO makes the appraisals on a national basis by obtaining input from regional committees in each State and Territory to take account of variations in local building regulations, practice and local climatic features.

CSIRO Appraisals bases its assessment on the product and information it receives and cannot accept responsibility for deviations in the manufactured quality and performance of the material, product or system. However, Technical Assessments will be withdrawn where adequate quality or performance has not been maintained.

This Technical Assessment is given a term of validity until 31 December 2009. Users of Technical Assessments should verify that Technical Assessments remain valid and are the current version by checking on the CSIRO Appraisals website: <http://www.cmit.csiro.au/services/appraisals/>.

A Technical Assessment must not be copied, in whole or in part, without authorisation by CSIRO Appraisals. Where permission is granted, copies must be of the entire document.

TECHNICAL ADVISORY COMMITTEE

G. Geary (Chairman)	Australian Institute of Building Surveyors
M. Fagan	Australian Institute of Building
R. Goodall	Master Builders' Australia Inc.
M Maffucci	Standards Australia
R. Oke	National Association of Testing Authorities, Australia
C. F. Woods	Housing Industry Association
B. Schafer	Industry Advisor
A. Griffin	C H Group
Kenneth KJ Lofhelm	Materials Science and Engineering, CSIRO
J. Sinclair	Materials Science and Engineering, CSIRO

REGIONAL REVIEW COMMITTEES

New South Wales	Northern Territory	South Queensland	Western Australia	South Australia
J. Lewer	F. Finocchiaro	S. Kajewski	C. Anderson	M. Andruchowycz
B. O'Mara	R. Luxton	K. J. Rauber	R. A. Wallis	N. Kirkham
	D. Malone			A. McKeough
	P. Nowland			H. Vormelker
Victoria	North Queensland	Tasmania	ACT	
M. Hopkins	M. Collard	A. Humphreys	S. Paterson	
P. Moore	R. Horton			
P. Phillips	G. Reardon			
G. Driscoll				

1. SOURCE ORGANISATION**2. ORGANISATIONAL UNIT**

Technical Secretariat

3. TYPE OF DOCUMENT/SERIES

CSIRO Technical Assessment

4. DOCUMENT NUMBER

327

A. INDEXING NUMBER

ISSN 0158-2577

B. FILE NUMBER(S)

560

C. RELEASING AUTHORITY

CSIRO

D. FOR ENQUIRIES CONTACT

CSIRO Appraisals (03) 9252 6000
Bayer MaterialScience Pty Ltd
(03) 9581 9888

5. TITLE/SUBTITLE

Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting

6. AUTHOR(S) *(Give Affiliation of External Authors or Co-authors)*

Kenneth KJ Lofhelm
J. Sinclair

E. DOCUMENT STATUS

- DRAFT DOCUMENT
 INTERIM DOCUMENT
 FINAL DOCUMENT

F. DOCUMENT STATUS

- NO RESTRICTIONS
 IN CONFIDENCE
 CLASSIFIED

7. PUBLISHER AND PLACE OF PUBLICATION

CSIRO/Melbourne

8. PUBLICATION REFERENCES

-

9. DATE OF ISSUE

(Month, Year)

10. NO. OF PAGES

AND FORMAT

11. PRICE

May 2006 (Makrolon® Multiwall); 9/A4
August 2006. TA 327 is amended to include reference to Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV - previously appraised under TA 317.
June 2009. Revalidated until 31 December 2009. Applicant name change – previously known as Laserlite Australia Pty Limited.

G. FOR DOCUMENTS PREPARED UNDER CONTRACT

CONTRACT NO.:

CONSULTANT'S NAME AND ADDRESS:

12. SUPPLEMENTARY NOTES**13. KEYWORDS** *(Up to 15 entries, Alphabetical Order Preferred, Divide by Semicolons)*

bushfire; carport; gazebo; *open sided*; patio; polycarbonate; roof cladding; UV radiation

H. RELATED DOCUMENTS**J. OTHER/OPTIONAL INFORMATION****14. ABSTRACT** *(CSIRO Appraisals Approved Assessment Extract)*

The Laserlite Apollo®, Laserlite XPT®, Laserlite® 2000, Makrolon® CS UV and Makrolon® Multiwall Polycarbonate Roof Sheeting as distributed by Bayer MaterialScience Pty Ltd (ACN 086 237 765) and its licensees is suitable as a roof cladding material for use on '*open sided*' gazebos, carports, patios and similar domestic construction in bushfire prone areas when the conditions of CSIRO Appraisals Technical Assessment 327 are fulfilled.