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TECHNICAL ASSESSMENT 216

January 1997[1, 2, 3, 4, 5, 6]

KORDON®

Physical Termite Barrier System

1. Formerly ABSAC Technical Opinion 216.
2. April 2001. Updated references.
3. December 2003: Change in company name to Bayer CropScience Pty Ltd.
4. August 2004: Change to system.
5. January 2006: Revalidated and updated technical assessment published.
6. November 2006. Updated to Include TA 255 “Kordon Termite Barrier – Perimeter and Service Penetration System”.

PURPOSE

A combination sheet to act as a physical barrier for protecting buildings and structures against concealed subterranean termite entry and as a vapour barrier

APPLICANT

Bayer CropScience Pty Ltd (ABN 87 000 226 022), 391-393 Tooronga Road, Hawthorn East, Victoria. 3123 (Manufacturer), trading as Bayer Environmental Science.

(Kordon® is a registered trademark of Bayer CropScience Pty Ltd)

TECHNICAL OPINION

In the opinion of CSIRO Appraisals, the Kordon Physical Termite Barrier System will provide a suitable physical barrier for protecting buildings and structures against concealed subterranean termite entry as required by Standards Australia, AS 3660-2000, 'Termite management. Part 1. New building work'.

There are two systems - Kordon TMB and Kordon TB. They have the same physical properties, the differentiation occurs depending on the installation method.

Kordon TMB when used as a continuous barrier with concrete slab-on-ground will provide a vapour barrier as required by AS 2870-1996 'Residential slabs and footings - Construction' (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002; and Amdt 4, May 2003).

Kordon TB is a building perimeter and building service penetration termite management system.

The following conditions apply for Kordon Systems to satisfy the above:

1. The Kordon System is installed, by Bayer accredited installers in accordance with the Bayer Environmental Science, "Reference Manual Kordon Termite Barrier and "Installation Details" on the web site www.kordontmb.com.au.

Note: This manual is available from Bayer Environmental Science, 391 – 393 Tooronga Road, Hawthorn East, Vic. 3123. Where required these installers are licensed according to their State regulations.

2. The installation is according to the design criteria whereby the Kordon blanket is compressed between two building products.

3. The Kordon System is manufactured to the specifications described in the Bayer Environmental Science "Internal Specification Document: AU04KTMB v03: Kordon Termite Blanket" (22 June 2004) and the membrane (vapour barrier) is not less than 0.2 mm in thickness.

4. Kordon TB will be used in conjunction with a concrete slab on ground constructed in accordance with AS 2870-1996, "Residential slabs and footings – Construction" (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002; and Amdt 4, May 2003) as one of the following:

(a) a continuous barrier around the perimeter and service penetrations
(b) a continuous barrier around the edge of an infill slab
(c) a continuous barrier at a cold joint between an existing slab and a new slab

5. Kordon TB is installed as one or a combination of the following:

(a) a continuous physical barrier in pier constructed structures
(b) a continuous physical barrier to retaining walls

6 The Kordon System may be installed with a lower clearance than the 75mm specified in AS 3660.1 when the lower surface is permanently hard.

7. The installer affixes a durable notice (in accordance with BCA requirements (Clause B1.4 (i) (ii) Volume 1 and Part 3.1.3.2 (b), Volume 2) to the building which states that the system is installed.

8 Inspections shall be carried out on an annual basis or more often if required by local conditions or regulations to ensure that no bridging or breaching of the barrier has taken place.

Notes:
(i) The Building Code of Australia draws attention to the need for regular inspections.
(ii) The installation of a termite barrier does not negate the need for regular competent inspections. Any additions, alterations or earth works, including gardening adjacent to the building, may render the barrier ineffective. Such activity should be referred to a specialist for appropriate advice.
(iii) Any additional treatment should be done in accordance with the relevant State or Territory regulations.

9. A building site inspection shall be carried out prior to installation and the following precautions taken in accordance with Clause 3.2 of AS 3660.1:

- Eliminate nests of wood feeding species of subterranean termite found within the property boundaries, up to distance of 50m from the proposed building work;
- Excavate and remove all tree stumps, roots and logs from the building footprint;
- All timber off-cuts, debris, removable framework and other waste material should be removed from the area in which the barrier is to be installed.

BUILDING CODE of AUSTRALIA

In the opinion of the CSIRO Appraisals, the systems described in this Technical Assessment and installed under the conditions listed herein will satisfy the performance requirements of Clauses BP1.1 and FP1.5 (Volume 1 – Class 2 to Class 9 buildings); and Clauses P2.1 and P2.2.3 (Volume 2 – Class 1 and Class 10 buildings) of the Building Code of Australia.

To meet the requirements of Clause P2.1.1 (relevant to Qld only) (Volume 2 – Class 1 and Class 10 buildings) of the Building Code of Australia (2006), the applicant has provided a declaration of system design life, which is set out in the Durability section of this Technical Assessment.

This declaration is only relevant for the system as described in this Technical Assessment and installed under the conditions listed in this Technical Assessment.

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) Any changes made to the BCA will be reviewed during the term of validity of this Technical Assessment and, where necessary, any amendment required will be published on the CSIRO Appraisals web pages on http://www.cmmt.csiro.au/Appraisals.

(iii) The BCA has AS 3660.1-2000 as deemed to comply for protection from concealed termite entry.

RELATED INFORMATION

VALIDITY OF THE ASSESSMENT

Condition:
This Technical Assessment applies only to the use of the Kordon System 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 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 August 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 Environmental Science "Reference Manual – Kordon Termite Barrier".

The Kordon web site www.kordontmb.com.au - Installation Details

Bayer Environmental Science "Internal Specification Document: AU04KTMB v03: Kordon Termite Blanket" (22 June 2004).

AS 3660.1-2000 "Termite Management Part 1: New Building Work".

AS 3660.3-2000 "Termite Management Part 3: Assessment criteria for termite management systems".

AS 2870-1996, "Residential slabs and footings – Construction" (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002; and Amdt 4, May 2003).

APPROVED ASSESSMENT EXTRACT

The Kordon Physical Termite Barrier System is supplied by Bayer CropScience Pty Ltd trading as Bayer Environmental Science, Hawthorn East, Victoria. It is suitable as a physical barrier to deter concealed entry by subterranean termites as required by AS 3660-2000, 'Termite management. Part 1: New building work'. When installed as a continuous barrier with concrete slab-on-ground it is a suitable vapour barrier. It may also be used as a damp-proof membrane. In both instances it meets the requirements of AS 2870-1996 'Residential slabs and footings - Construction' (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002; and Amdt 4, May 2003). In all instances the system must be installed by a Bayer accredited installer and the conditions of CSIRO Appraisals Technical Assessment 216 must be fulfilled.

APPRAISAL

DESCRIPTION

This description is based on information supplied by the applicant.

General:
The Kordon System is a composite blanket comprising two layers of plastic membrane separated by a fibrous layer that has been impregnated with a synthetic pyrethroid insecticide.

The Kordon System is used as a barrier to prevent concealed entry by subterranean termites at the point where it is installed. In some circumstances it may be installed as a vapour barrier and damp proof membrane.

Testing indicates that it will not compromise the capacity of a building to resist a shear force.

Membrane specification:
A standard moisture vapour barrier of low-density polyethylene (LDPE) is 0.2 mm thick and meets IR3 strength requirements (colour orange). A synthetic fibrous web approximately 2 mm thick having a density of 140 – 240 g/m^2 and treated with deltamethrin, a synthetic pyrethroid insecticide, is laminated to the orange membrane. A second sheet of LDPE, 0.05 mm thick and black in colour is laminated to the webbing.

The Kordon blanket is printed on the orange side with 'Kordon Termite Barrier Contains Deltamethrin'.

Tape:
This is a 50 mm wide PVC tape labelled with warnings to other building trades that the Kordon System is installed and should not be damaged.

Installation:
Installation instructions are provided in the Bayer Environmental Science "Reference Manual – Kordon Termite Barrier" and in the section "Installation Details" on the web site www.kordontmb.com.au.

The membrane is installed with the orange side up. Where necessary the membrane is joined by PVC Duct tape (not less than 30mm wide) with overlaps not less than 200mm for Kordon TMB and 50mm for Kordon TB.

Sealing penetrations through concrete slabs is achieved by using prefabricated Kordon Kollars or 'collars and patches'. The instructions are summarised below.

1. **Slab on-ground - termite barrier incorporating a vapour barrier.**
   The Kordon blanket is installed after the footings and plumbing have been completed and before steel reinforcing is laid for the concrete slab. The Kordon blanket is generally limited to under slab application and edge termination details are as for vapour barriers.

   There are two installation options:
   (a) The Kordon blanket is placed beneath the slab so that the bottom surface of the slab and beams are entirely underlaid, or
   (b) Where edge or internal beams are deeper than 150 mm, the Kordon blanket is placed beneath the bottom surface of the slab only. Beams are underlaid with conventional vapour barrier or damp-proofing membrane, joined to the under surface of the Kordon blanket with PVC duct tape. In this case, slab perimeters should be protected against termite entry by the Kordon System or by maintaining exposed edges or other options as specified in AS 3660.1-2000.

Service Penetrations.

2.1 Manual Method
Vertical penetrations. Two slits are cut in the membrane to form a cross, which is then fitted over the penetration. A separate piece of Kordon blanket (approximately 40 mm wide and 20 mm longer than the perimeter of the pipe) is then wrapped around the pipe and secured with duct tape. A separate piece of Kordon blanket approximately 300 mm square with a hole slightly less than the pipe diameter is forced over the penetration to fit firmly on the collar. The collar is secured with cable ties, clamps or similar and covered with duct tape. The edges of the patch are also taped with duct tape.

Horizontal penetrations. The membrane is cut and moulded around the penetration. It is joined with PVC tape and then 'collared' with a second strip of Kordon blanket. A preformed Kordon sleeve is placed over the penetration and collar. All edges are taped with PVC Duct tape and cable ties are used to ensure complete contact with the penetration.

In situations where the slab area immediately surrounding the service penetration for a bath or premoulded shower tray is to be poured independently, the method of installation is modified by laying the membrane 100 mm below the corresponding fill height and then joining it as for vertical penetrations.

2.2 Pre-fabricated Method
Kordon Kollars – Horizontal and Vertical penetrations. Install the prefabricated Kollar over the service penetration. The Kollar is secured with two cable ties, clamps or similar. A strip of duct tape is used to seal the top of the vertical section of the Kollar to the pipe. For horizontal penetrations all edges are taped with PVC duct tape and cable ties are used to ensure complete contact with the penetration.

3. **Cavity walls.**
   Kordon blanket can be installed to the horizontal surface of the slab edge and secured either under the timber base plate or internal brick, depending on the type of construction.

   At edge rebates, on brick veneer construction the Kordon blanket is installed along the rebate. The damp proof course is installed on top of the Kordon blanket. Brickwork is then laid on top of the DPC. The Kordon blanket may be visible or within 5 mm of the external face depending on the finish of the external brick/brickwork.

   At doorways with a rebate or where a tile tread is fixed under the doorway, the Kordon blanket is fixed to the vertical face of the slab rebate with a steel strap or other termite resistant material. The Kordon blanket must extend 15 cm either side of the doorway. When the door is positioned onto the slab, the Kordon blanket is cut so that it comes up to the edge of the doorway frame.

   Encroachment on the 75 mm inspection zone.
   Where there is a permanent hard surface below the membrane the Kordon blanket can be finished with less than a 75 mm inspection clearance to the finished level. At doorways a minimum of 20 mm would be adequate provided doormats are not located against the edge of the threshold. If a doormat is used the clearance should be 35 mm.

   Over a hard surface patio area a 30 mm clearance is adequate.

4. **Cold-joint installation between an existing structure and a new slab.**
   Kordon blanket is adhered onto the existing structure without any gaps and then sandwiched between the concrete being poured and the existing structure.

5. **Perimeter attachment.**
   Details are provided for pathways, driveways, etc where a minimum 300 mm wide strip of Kordon blanket is installed to the vertical of the slab, folded back on itself, secured with an approved spray adhesive and both nailed and glued to the slab edge prior to the concrete pour. If an expansion material is used it will be installed to the Kordon blanket and not the slab edge.

Exposed slab edges, where exposed for a minimum of 75 mm, either the Kordon blanket:
- is finished at ground level; or
- is attached to the vertical face of the slab to finish immediately below or into the first course of masonry. It may be secured by a variety of methods including mortar, masonry concrete fasteners, or concrete nails. Fibre cement panels may be used as a cover strip.

6. Other construction methods
Details are provided in the Kordon Manual and the Kordon web site for the use of Kordon in:

(a) All concrete slab construction types
(b) Core-filled and standard block construction
(c) Suspended timber floors
(d) Bearers and joists construction
(e) Retaining walls
(f) Piers and engaged piers
(g) Light weight block constructions
(h) Termite shielding and termite caps
(i) Electrical cabling
(j) Other construction types as per the "Reference Manual – Kordon Termite Barrier" and "Installation Details in www.kordontmb.com.au.

DESIGN INFORMATION

General:
Kordon is a laminated plastic vapour barrier of which one layer includes an insecticide suitable to deter subterranean termite attack. *

Durability:
CSIRO Appraisals does not assess the durability of termite barriers.

The applicant, Bayer CropScience Pty Ltd, has made the following declaration (highlighted in italics):

- *"Kordon has been designed to achieve a service life of 50 years during which period the constituent components, are expected to maintain efficacy and in combination function as a termite barrier in accordance with AS 3660.1-2000;*
- *Kordon has been designed in accordance with a quality management system that incorporates a set of rules for the design, manufacture, installation and maintenance of all elements of the system; and*
- *The components used in the manufacture of Kordon have been selected for their intended purpose and are expected to operate in accordance with their specification for the duration of the design life.*

The durability of Kordon as a termite barrier has been under evaluation by the CSIRO Division of Entomology since 1989. This has been conducted at several locations with exposure to Coptotermes acinaciformis and Mastotermes darwiniensis . Kordon has been placed in positions of extreme termite pressure and has not been penetrated.

CSIRO has also tested Kordon containing lower concentrations of insecticide. Termiticide concentrations as low as 10% of the minimum commercial rate have proven effective for many years. Studies of the rate of degradation of the termiticide in Kordon allow estimation of the period before the concentration drops below the level that provides an effective barrier against termites.

Using the results of these two tests it can be demonstrated, via modelling, the service life of Kordon to be at least 50 years and expected to still be functional after 60.

This work is summarized in a "Review of the service life expectancy of Kordon TMB and Kordon Termite Barrier for protection of new buildings from attack by subterranean termites" Phillip M Morrow Aventis Environmental Science – July 2002 (Bayer purchased the business of Aventis including Kordon in mid-2002.

A review of this paper by Dr MJ Kennedy, Forest Products, Department of Primary Industry, Queensland, supported the conclusions in the Review."

Thickness:
The laminated membrane consists of three layers - one orange plastic which is 0.2 mm thick, one white fibrous layer 2 mm thick and one black plastic 0.05 mm thick.

* Note: Although there has been a change to the product, CSIRO Appraisals considers the test reports and other documentation to be relevant to the appraised product.

BASIS OF APPRAISAL

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

(a) installation procedures

(b) compliance with AS 3660-2000, 'Termite management. Part 1. New building work' and AS 2870-1996 'Residential slabs and footings - Construction' (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002 ;and Amdt 4, May 2003).

(c) compliance with AS 3660.3 – 2000 "Termite Management Part 3: Assessment criteria for termite management systems

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

Manufacturer's Information:

1. **Bayer Environmental Science, 391 – 393 Tooronga Road, Hawthorn East, VIC 3123 "Reference Manual – Kordon Termite Barrier" (June 2004):**
   This manual contains information about the system specifications, warranty, installation details, and accredited installers. Bayer Environmental Science is a business group of Bayer CropScience Pty Ltd.

2. **Bayer Environmental Science "Internal Specification Document: AU04KTMB v03: Kordon Termite Blanket" (22 June 2004):**
   This document contains the specifications of the Kordon Termite Barrier and is applicable to Kordon TMB Termite Moisture Barrier and Kordon Termite Barrier.

3. **Summary Section from 'Part 8 – Efficacy and Safety' from submission to the National Registration Authority for registration of Kordon Manufacturing Concentrate' (15 March 1996):**
   This is a summary of the chemical used in the fibrous layer. It has been tested as a termiticide for the last six years. Based on degradation studies in soil, and given certain assumptions, results have been extrapolated for long-term efficacy.

4. **National Registration Authority for Agricultural & Veterinary Chemicals, Barton, ACT, 'Notice of registration of chemical product and approval of label under the Agvet Codes' (27/09/96):**
   This was issued to Hoechst Schering AgrEvo for Kordon Manufacturing Concentrate (now owned by Bayer CropScience Pty Ltd).

5. **Aventis Environmental Science Report 'Retention analysis of Kordon Termite Barrier exposed to the environment following installation on a concrete slab.' Jeffrey Einam (24 August 2001):**
   In this study the level of retention of deltamethrin in Kordon TMB when exposed to the environment for three months was investigated. The level of deltamethrin within the Kordon TMB did not deplete below minimum specification of 1.0 g/m² following a three-month outdoor exposure.

6. **Bayer CropScience Pty Ltd "Kordon Kollar Specification" (September 2003):**
   This provides details of the manufacture of the prefabricated Kollars and the specification for the final collar.

7. **Aventis Environmental Science Report "Review of the Service Life Expectancy of Kordon TMB and Kordon Termite Barrier for Protection of New Buildings from attack by subterranean termites" P. Morrow July 2002:**
   This report examines data from field and laboratory studies to predict the service life expectancy of Kordon TMB and Kordon Termite Barrier. It concludes that the system does not rely on replenishment of the barrier and uses modelling to estimate that the service life of the system can be expected to be a minimum of 50 years. The data used in the analysis includes measurements of the rate of degradation of the active chemical and expressing it as a half life (i.e. the period for a chemical to degrade to half its original concentration). The level of deltamethrin in Kordon below which it would cease to function as an effective termite barrier can be estimated by experiment, and hence, the number of half-lives for Kordon to no longer repel termites can be calculated.

8. **Queensland Government, Department of Primary industry, Report by Dr Michael J Kennedy Forest Products Division, QFRI (8 January 2003):**
   Dr Kennedy agreed with the conclusions drawn by Mr P. Morrow in his paper *"Review of the Service Life Expectancy of Kordon TMB and Kordon Termite Barrier for Protection of New Buildings from attack by subterranean termites"* that the expected service life of Kordon Termite Barriers are well founded, upon adequate data obtained under appropriate conditions.

9. **Queensland Government, Department of Primary industry, Report by Mr B C Peters Principal Entomologist (23 April 2001):**
   Mr Peters stated the durability of the Kordon as a termite barrier does not rely on replenishment of the insecticide.

10. **H.I.A. S.A. Technical Committee. P Jankovic. S.A.Housing Code 2002. Amendment 9 (1/01/03):**
    Cl 2.6.2 specifies where a perimeter termite barrier is installed and there is a raft slab with a rebate the paved area shall be a minimum 15 mm below the finished concrete level of the edge rebate

11. **Eric Fox Consulting Pty Ltd, E Fox (3 September 2003) Render Vee Joint details in Installation Details diagram kd 008:**
    This letter relates to detail kd 008/d, which contains the installation of a "vee joint" and states:

    "Where open edge of Kordon is concealed by a skim coat of render, the nominal coverage of the thickness of the render is to be 2-3 mm. Construction tolerance may result in local increase of thickness of up to 5 mm. In this context local variations shall not exceed more than 10% of the perimeter of a given installation."

12. **Letter from Bayer CropScience Pty Ltd (28 September 2006) Stephen Byrne, Kordon Business Manager, Bayer Environmental Science:**
    This letter contains a declaration of the design life of of Kordon Physical Termite Barrier. Please refer to the durability section in this technical assessment for further information

Test Reports:

1. **University of Sydney, Department of Mechanical and Mechatronic Engineering, New South Wales 2006. Test Certificate (17 May 1996):**
   This report on the Kordon Blanket provides results for density, impact resistance and elongation at break. It concludes that membranes are 'tough, reliable and readily adaptable'.

2. **INSEARCH Limited (Can 001 425 065), Level 2, 187 Thomas St, Sydney, NSW 2000. 'Compliance Strategies for accreditation of the Kordon TMB (Termite Moisture Barrier) through the Australian Building Systems through the Australian Building Systems Appraisal Council for AgrEvo' (Project Number E95/09/110, May 1996):**
   Topics discussed in this report include background, installation considerations, durability considerations, microscopy and strength performance issues.

3. **CSIRO Division of Entomology, Termite Group Report No 2005/19 "Report on field trials after 15 years with deltamethrin-impregnated Kordon blanket as a barrier against Australian Subterranean termites at sites near Griffith, NSW and Darwin, NT' (W. Whitby) (5/09/05):**
This report contains results of the 15th annual inspection of Kordon TMB field tests which have been under way at sites in NSW and the Northern Territory. In brief, all Kordon TMB samples at ground level have revealed no penetration of treated blankets after 15 years while there has been extensive penetration of the untreated control samples and the treated samples that did not contain the moisture-proofing membrane that forms part of Kordon TMB.

4. **CSIRO Division of Entomology, Termite Group Report No. 2005/9 "Evaluation of Kordon TMB as a barrier against field colonies of the Australian subterranean termites Mastotermes darwiniensis and the tree-nesting form of Coptotermes acinaciformis' P.V. Gleeson March 2005:**
This report contains results of the second annual inspection of Kordon TMB field tests which have been under way at sites in NSW and the Northern Territory. This trial is being performed using the current version of Kordon TMB with the new fibrous web sheet. In brief, all of the experimental Kordon TMB units remained in tact and have revealed no penetration of treated blankets after two years while there has been penetration of the untreated control samples.

5. **Morgan Fox & Harvey Pty Ltd, 1 Great George Street, Paddington, Queensland 4064. 'Report on Kordon TMB in support of application for ABSAC approval' (Eric Fox) (August 1996):**
This report includes a background summary of the development of the product, product description and application, compliance summaries, performance criteria as a termite barrier, manufacture and supply details including an outline of quality control, installation details, in-service performance, environmental aspects, and health and safety aspects. The upper membrane is an LDPE membrane 0.2 mm thick, orange in colour and 'has been assessed for compliance with the requirements for 'vapour barrier' and 'damp-proof membrane; as stated in Australian Standard, AS2870-1996.'

6. **CSIRO Molecular Science Report, 'Insecticide Controlled Release in Kordon TMB; Phase 4 – Part 1 Initial deltamethrin concentrations' (Dr Russell Varley) (27 February 1998):**
This report contains results of an experimental program to evaluate various alternative materials (including both the original fibrous web used in Kordon TMB and the fibrous web currently used in Kordon TMB). In brief, the performance of the Kordon TMB with both versions of the fibrous web was comparable.

7. **CSIRO Molecular Science Report, 'Insecticide Controlled Release in Kordon TMB; Phase 4 – Part 2 Ageing of Webbing Alternate Candidates' (Dr Russell Varley) (20 May 1998):**
This report contains results of an experimental program to evaluate various alternative materials (including both the original fibrous web used in Kordon TMB and the fibrous web currently used in Kordon TMB). The webbings were subjected to 100°C and 45°C at relative humidity 98% for four weeks to determine whether there was any difference in the stability of deltamethrin on the alternative fabrics. In brief, ageing at 100°C suggested that the fibrous web currently used in Kordon TMB provided performance at least as comparable with the performance of the old fibrous web. Ageing at 45°C at high humidity had little effect on the deltamethrin regardless of the type of webbing.

8. **CSIRO Molecular Science Report, 'Insecticide Controlled Release in Kordon TMB; Phase 4 – Part 2 Ageing of Webbing Alternate Candidates' (Dr Russell Varley) (21 July 1998):**
This report contains results of an experimental program to evaluate various alternative materials (including both the original fibrous web used in Kordon TMB and the fibrous web currently used in Kordon TMB). The webbings were subjected to 70°C and 85°C for four weeks to determine whether there was any difference in the stability of deltamethrin on the alternative fabrics. In brief, ageing at 70°C and 85°C suggested that the fibrous web currently used in Kordon TMB provided performance at least comparable with the performance of the old fibrous web.

9. **Gelpack Enterprises Pty Ltd, 117 Newton Road, Wetherill Park, NSW. Test report on Building Film for Joyce Australia (9 January 1996):**
This report of testing provides results for impact strength (ASTM D1709-62T), tear resistance (ASTM D1922-67) and puncture resistance (in-house method). The results were satisfactory for a water vapour barrier membrane under concrete slab on ground.

10. **Casey TAFE, Client Services-Technology, Centre for polymer Technology, 121 Stud Road, Dandenong 3175. Technical Report Summary ESPRC No 133/96 (24 September 1996):**
This report is on penetration resistance of water vapour barriers to falling aggregate and water vapour permeance. The results meet the requirements for compliance with AS 2870.

11. **The University of Newcastle, NSW, Dept of Surveying and Environmental Engineering. G Simundic, 'The Shear Capacity Testing of Kordon' (June 1999):**
The tests indicate the presence of Kordon in a perimeter wall installation will not compromise the capacity of the wall to resist wind loads.

Inspections:
CSIRO Appraisals representatives have inspected installations of the system and found them to be satisfactory.

Simon Hanson
General Manager: 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.

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Each Technical Assessment has been prepared by CSIRO Appraisals and then reviewed 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.

Technical Assessments are given a term of validity of three years from the date of issue. They are reviewed at the end of the term of validity which may be extended for a subsequent three-year term. Technical Assessments may be amended during the term of validity. 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.cmmt.csiro.au/services/appraisals/.

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S.S. Hanson

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January 1997; Issued. April 2001; Updated references; December 2003. Change in company name to Bayer CropScience Pty Ltd; August 2004. Change to system; January 2006; Revalidated & updated technical assessment; November 2006. Updated to include TA 255

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12. SUPPLEMENTARY NOTES

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

CSIRO Appraisals; barrier; concrete; damp proof course; Kordon; physical barrier; sheet; slab on ground; subterranean; termite; vapour; water.

H. RELATED DOCUMENTS

J. OTHER/OPTIONAL INFORMATION

14. ABSTRACT *(CSIRO Appraisals Approved Assessment Extract)*

The Kordon Physical Termite Barrier System is supplied by Bayer CropScience Pty Ltd trading as Bayer Environmental Science, Hawthorn East, Victoria. It is suitable as a physical barrier to deter concealed entry by subterranean termites as required by AS 3660-2000, 'Termite management. Part 1: New building work'. When installed as a continuous barrier with concrete slab-on-ground it is a suitable vapour barrier. It may also be used as a damp-proof membrane. In both instances it meets the requirements of AS 2870-1996 'Residential slabs and footings - Construction' (Amdt 1, January 1997; Amdt 2, June 1999; Amdt 3, November 2002; and Amdt 4, May 2003). In all instances the system must be installed by a Bayer accredited installer and the conditions of CSIRO Appraisals Technical Assessment 216 must be fulfilled.