BRANZ Appraised
Appraisal No. 604 [2008]

STOTHERM MASONRY INSULATION SYSTEM

Appraisal No. 604 (2008)

Amended 11 November 2015.

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 The StoTherm Masonry Insulation System is an exterior insulating and finishing system for concrete masonry, in-situ or pre-cast concrete walls.

1.2 The system consists of expanded polystyrene (EPS) StoTherm Panels fixed to the concrete masonry or concrete wall with adhesive mortar and mechanical anchors. The plaster system consists of an 8-12 mm thickness of fibreglass mesh reinforced synthetic resin plasters and synthetic resin finishing plasters applied to the StoTherm Panels. The plaster system is finished with a 100% acrylic exterior paint system. The top coat plasters can be textured to give different finished appearances.

Scope

2.1 The StoTherm Masonry Insulation System has been appraised as an exterior insulating and finishing system for buildings within the following scope:

- with substrates of concrete masonry, in-situ or pre-cast concrete, up to 3 storeys, with a maximum height from ground to eaves of 10 m; and,
- with floor plan area limited only by seismic and structural control joints; and,
- with supporting structures designed and constructed in accordance with the NZBC; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 The StoTherm Masonry Insulation System has also been appraised for bond/fixing, durability and weathertightness of the exterior insulating and finishing system for concrete masonry, in-situ or pre-cast concrete buildings subject to specific design up to a differential design ultimate limit state (ULS) wind pressure of 2.5 kPa.

2.3 The StoTherm Masonry Insulation System must only be applied on vertical surfaces except for sills, concrete reinforced parapets and concrete reinforced balustrades which must have a minimum 10° slope and be waterproofed in accordance with the requirements of the Technical Literature and building designer.

2.4 The StoTherm Masonry Insulation System for use on buildings within the scope detailed in Paragraph 2.1 is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of the StoTherm Masonry Insulation System relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.]*

2.5 Installation of plasters and accessories supplied by Stoanz Limited and approved applicators must be carried out only by Stoanz Limited approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the StoTherm Masonry Insulation System if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The StoTherm Masonry Insulation System meets the requirements for loads arising from self-weight, wind, impact and creep. [i.e. B1.3.3 (a), (h), (j) and (q)]. See Paragraphs 10.1 – 10.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.1 (c), 5 years. The StoTherm Masonry Insulation System meets these requirements. See Paragraphs 11.1 and 11.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The StoTherm Masonry Insulation System meets this requirement for buildings within the scope detailed within Paragraph 2.1 and contributes to meeting this requirement for buildings within the scope detailed within Paragraph 2.2. See Paragraphs 16.1 and 16.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The StoTherm Masonry Insulation System meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a) and H1.3.2 (A and B). The StoTherm Masonry Insulation System contributes to meeting these requirements. See Paragraphs 17.1 and 17.2.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 The StoTherm Masonry Insulation System consists of StoTherm Panels, which are coated with a 5-8 mm thickness of polystyrene bead saturated polymer-modified, cement based levelling plaster, a 2.5-3.0 mm thick coat of fibreglass mesh reinforced non-cement plaster, and an approximate 1-3 mm (as selected) thick coat of non-cement coloured finish plaster. The plaster is coated with a 100% acrylic paint. The top coat plasters can be finished to give different texture appearances.

4.2 System components and accessories supplied by Stoanz Limited for the StoTherm Masonry Insulation System are:

StoTherm Panels

- **StoTherm Panels** are 40, 60, 80 or 100 mm thick Class S EPS with a nominal density of 16 kg/m^3. The panels are supplied 1200 mm wide x 600 mm high and must be manufactured to meet the requirements of AS 1366.3. Other panel thicknesses up to 200 mm are available on request.

StoTherm Masonry Insulation System Plasters

- **Gluecoat Mortar** is a polymer modified, white cement-based adhesive plaster comprising graded sand and additives. The plaster is supplied in 25 kg bags and is mixed on site with clean drinking water. It is trowel applied to the back face of the StoTherm Panels prior to them being applied to the wall.
- **LevelLite** is a polymer-modified, cement-based plaster comprising coarse sand, polypropylene fibres, polystyrene beads and adhesives. The plaster is supplied in 20 kg bags and mixed on site with clean water. It is trowel or pump-applied as a base coat in a 5-8 mm thick layer.
- **StoArmat RFP** is a plasticiser free, tintable, ready-to-use, polymer-modified, cement free reinforcement plaster comprising granulated quartz sands, calibration grain, polypropylene fibre and additives. It is supplied in 23 kg pails, and after mixing, is ready for use. It is trowel-applied in a 2.5-3.0 mm thick layer with the embedment of fibreglass mesh reinforcement in the outer surface.
- **Stolit MP/K** is a plasticiser free, tintable, ready-to-use, polymer-modified, cement free finishing plaster with a 1, 1.5, 2 or 3 mm grain size. It is supplied in 25 kg pails and is trowel-applied to an approximate thickness of 1-3 mm.

- **Sto Flexyl** is a cementitous waterproof paste. It is used as a waterproofing membrane over plastered reinforced concrete balustrades and parapets, window and door joinery sills and rebates. Sto Flexyl is supplied in 18 kg pails.

StoTherm Masonry Insulation System Paints

- **StoColor Maxicryl** is a ready-to-use, tintable, acrylic exterior paint system for application over finishing plasters. It is supplied in 15 litre pails, and may be brush, roller or spray applied. The paint colour selected must have a light reflectance value (LRV) of 40% minimum regardless of gloss value.
- **StoLastic Color** is a ready-to-use, tintable, satin matt, acrylic exterior paint system paint for application over finishing plasters. It is supplied in 15 litre pails, and may be brush, roller or spray applied. The paint colour selected must have an LRV of 40% minimum regardless of gloss value.

Accessories

- **Reinforcing mesh** - alkali-resistant fibreglass mesh with a nominal mesh size of approximately 6.0 x 6.0 mm and an approximate weight of 165 g/m^2, or with a nominal mesh size of approximately 4.0 x 4.0 mm and an approximate weight of 165 g/m^2.
- **uPVC components** – drip edge, control joint flashing and cap/foot tray.
- **Sto pre-meshed corner beads** – uPVC and fibreglass mesh corner mouldings.
- **Sto Joint Sealing Tape 2D** – black, compressed polyurethane foam. The foam is coated on one side with a pressure sensitive adhesive, which is covered by a release paper. The tape is available 2 and 5 mm thick, expanding to maximum 6 and 12 mm thick after installation, and is supplied in rolls 15 mm wide and 18 and 9 m long respectively.
- **Sto Pageris foam** – polyurethane foam for joining the StoTherm Panels.
- **StoTherm Anchors** – screw applied anchors with an integrated 60 mm diameter high density polyethylene washer and screw sleeve, and an electroplated galvanised steel screw. The StoTherm Anchor length is selected to suit the StoTherm Panel thickness.
- **ST Insulation Caps** – 60 mm diameter polystyrene caps for StoTherm Anchors.
- **Hilti X-IE Wall Insulation Fastener** - powder actuated fasteners for face fixing 40 and 60 mm thick StoTherm panels. The fasteners consist of an integrated 60 mm diameter high density polyethylene washer and sleeve, and a zinc coated carbon steel nail.

4.3 Accessories used with the plaster systems which are supplied by the approved applicator are:

- Flexible sealant - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- Adhesive – polystyrene compatible adhesive for adhering uPVC components to the StoTherm Panels, as and where required.

4.4 Accessories used with the plaster systems which are supplied by the building contractor are:

- Window and door trim cavity air seals – air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal for use around window, door and other wall penetration openings.

Handling and Storage

5.1 Handling and storage of all materials supplied by Stoanz Limited or the approved applicator, whether on or off site, is under the control of the Stoanz Limited approved applicators. Dry storage must be provided for the fibreglass mesh and bags and pails of plaster mix. StoTherm Panels, uPVC flashings and profiles must be protected from direct sunlight and physical damage, and should be stored flat and under cover. Liquid components must be stored in frost-free conditions.

5.2 Handling and storage of all materials supplied by the building contractor, whether on or off the site is under the control of the building contractor. Materials must be handled and stored in accordance with the relevant manufacturer's instructions.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the StoTherm Masonry Insulation System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

Solid Substrates

Concrete Masonry

7.1 Concrete masonry must be designed and constructed in accordance with NZS 4210 and either NZS 4229 or NZS 4230. The concrete masonry walls must be fully grouted.

In-situ and Pre-cast Reinforced Concrete

7.2 In-situ and pre-cast reinforced concrete walls must be specifically designed in accordance with NZS 3101 and AS/NZS 1170 using the design guidelines.

General

8.1 When the StoTherm Masonry Insulation System is used for specifically designed buildings up to a differential design ULS wind pressure of 2.5 kPa, only the bond, durability and weathertightness aspects of the StoTherm Panels, plaster and finishing system are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 A minimum of 28 days must be allowed following placement of the concrete or grout before the installation of the StoTherm Masonry Insulation System begins. The approved applicator must be satisfied that the substrate is sufficiently cured and dry before starting.

8.3 The ground clearance to finished floor levels as set out in NZBC Acceptable Solution E2/AS1, Table 18 must be adhered to at all times.

8.4 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Electrical Cables

8.5 PVC sheathed electrical cables must be prevented from direct contact with the StoTherm Panels. When cables must penetrate the StoTherm Panels for exterior electrical connections, the cable must be directly supported by passing through an electrical conduit.

Control Joints

9.1 Control joints in the StoTherm Masonry Insulation System must be constructed in accordance with the Technical Literature, and be provided as follows:

- aligned with any control joint in the solid substrate; and,
- where the system covers different solid substrates.

Structure

Impact Resistance

10.1 The system has adequate resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in commercial type situations should be considered at the design stage, and appropriate protection such as the installation of barriers or bollards should be provided for vulnerable areas.

[Note: Additional coats of reinforced plaster or a heavier grade mesh can be used to increase impact resistance.]

Wind Zones

10.2 The system is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are within the scope as detailed in Paragraph 2.1, or up to a differential design ULS wind pressure of 2.5 kPa where buildings are specifically designed.

StoTherm Panel Fixing

10.3 StoTherm Panels must be installed in a brick pattern. Gluecoat Mortar must be applied to the back face of the panel with a notched trowel in a 75 mm continuous band around the perimeter, with an additional three 150 mm diameter spots through the middle of the panel. After adhering the StoTherm Panels to the wall and leaving to set overnight, the panels must be mechanically fixed with the selected anchors at 600 mm centres along the panel edges plus one fixing positioned in the middle of the panel. Refer to the Technical Literature for a diagrammatic layout of the Gluecoat Mortar and StoTherm Anchor requirements.

Durability

11.1 The StoTherm Masonry Insulation System meets the performance requirements of NZBC Clause B2.3.1 (b), 15 years for the plaster system, and the performance requirements of NZBC Clause B2.3.1 (c), 5 years for the exterior paint system.

Serviceable Life

11.2 The StoTherm Masonry Insulation System is expected to have a serviceable life of at least 30 years provided it is maintained in accordance with this Appraisal, the StoTherm Panels, fixings and plasters are continuously protected by a weathertight paint system and remain dry in service and the NZBC external moisture and internal moisture provisions are met.

Maintenance

12.1 Regular maintenance is essential for StoTherm Masonry Insulation System installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.

12.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, plaster, flashings and any sealed joints remain in a weatherproof condition. Any cracks, damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Sealant, paint coatings and the like must be repaired in accordance with the sealant or Stoanz Limited's instructions.

12.3 Regular cleaning (at least annually) of the StoTherm Masonry Insulation System is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent.

12.4 Recoating of the paint system will be necessary throughout the life of the plaster system. The interval between recoats depends on the paint colour, orientation and quality of the application, and will be at approximately 5-10 yearly intervals in accordance with the instructions of Stoanz Limited.

Control of Internal Fire and Smoke Spread

13.1 Polystyrene used with the system must meet the flame propagation criteria of AS 1366 as specified in NZBC Acceptable Solution C/AS1 Paragraph 4.2.2 or NZBC Acceptable Solutions C/AS2 to C/AS6 Paragraph 4.17.2. The completed wall system must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solutions C/AS1 to C/AS6.

Control of External Fire Spread

14.1 The StoTherm Masonry Insulation System has a peak heat release rate of less than 100 kW/m^2 and a total heat released of less than 25 MJ/m^2. In accordance with NZBC Acceptable Solution C/AS1 Table 5.1 the system is suitable for use on buildings with a SH Risk Group classification, at any distance to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.

14.2 When buildings in all Risk Groups, apart from SH, are of three or more storeys, and when the cladding system extends to cover the walls of at least three storeys, the requirements for barriers to vertical fire spread in accordance with NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.7.17 must be met. Design of the barrier joint must be specifically detailed by the designer to meet the NZBC. NZBC Acceptable Solution C/AS2 to C/AS6, Figure 5.8 gives an acceptable detail for barriers. These joints are not covered by the Technical Literature, and therefore are outside the scope of this Appraisal.

Prevention of Fire Occurring

15.1 Separation or protection must be provided to the StoTherm Masonry Insulation System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

16.1 StoTherm Masonry Insulation System installations when installed and maintained in accordance with this Appraisal and the Technical Literature will contribute to the building meeting code compliance with NZBC Clause E2.3.2 by providing a weatherproof coating system to the substrate.

16.2 For buildings constructed in accordance with Paragraph 2.1 of this Appraisal, the ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. For buildings constructed in accordance with Paragraph 2.2 of this Appraisal, the weathertightness detailing must be specifically designed and is the responsibility of the designer. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

16.3 The detailing of junctions between the StoTherm Masonry Insulation System and other wall penetrations, e.g. meter boxes, and other cladding and roofing junctions are the responsibility of the designer for compliance with the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Energy Efficiency

Building Thermal Envelope

17.1 NZBC Acceptable Solution H1/AS1 or NZBC Verification Method H1/VM1 can be used for housing, communal residential, communal non-residential and commercial buildings.

Determining Thermal Resistance

17.2 The thermal resistance (R-values) of building elements may be verified by using NZS 4214. The BRANZ 'House Insulation Guide' Third Edition provides thermal resistances of common building elements and is based on calculations from NZS 4214. For this system, unless better information is available for a specific case, the R-value of the StoTherm Panels must be taken as R0.98 for the 40 mm thick panel, R1.46 for the 60 mm thick panel, R1.95 for the 80 mm thick panel and R2.44 for the 100 mm thick panel, based on a thermal conductivity (k-value) of 0.041 W/m °C.

Installation Information

Installation Skill Level Requirements

18.1 Installation and finishing of components and accessories supplied by Stoanz Limited and the approved applicator must be completed by trained applicators, approved by Stoanz Limited.

System Installation

StoTherm Masonry Insulation System

19.1 Components and accessories supplied by Stoanz Limited and the approved applicator must be installed in accordance with the Technical Literature by Stoanz Limited approved applicators.

19.2 The StoTherm Masonry Insulation System must only be applied when the air and substrate temperature is within the range of +5°C to 30°C.

Inspections

19.3 The Technical Literature must be referred to during the inspection of StoTherm Masonry Insulation System installations.

Health and Safety

20.1 Safe use and handling procedures for the components that make up the StoTherm Masonry Insulation System are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

21.1 The following testing has been completed by BRANZ:

- Tensile bond strength of the StoTherm Masonry Insulating System to concrete masonry.
- Durability testing of the Sto Flexyl waterproofing membrane to the requirements of AS/NZS 4858 Table 8, Parts (a) – (e), except that bleach and detergent immersion set out in Appendix A was not required.
- Cone Calorimeter testing of the StoTherm Masonry Insulation System plasters over EPS. The testing was carried out in accordance with AS/NZS 3837.

Other Investigations

22.1 BRANZ expert opinion on NZBC clause E2 code compliance for the StoTherm Masonry Cladding System was based on a review of the BRANZ Site Visit Report Database to determine the historical weathertightness performance of polystyrene block and solid masonry/concrete exterior wall types, and evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Clause E2 External Moisture.

22.2 BRANZ expert opinion on NZBC clause B1 code compliance for the StoTherm Masonry Cladding System was based on the tensile adhesion strength of the Gluecoat Mortar. Using the data from this testing, the characteristic strength of the glue bond was calculated using the BRANZ EM1 method. By factoring in a strength reduction factor, the maximum resistance of the glue bond was determined. By comparing the resistance of the glue bond with the demand wind pressures using the NZS 3604 stipulated wind speeds and AS/NZS 1170 pressure coefficients, an opinion was given by BRANZ technical experts that determined the suitability of the cladding system for use in the relevant Building Wind Zones.

22.3 A durability opinion has been given by BRANZ technical experts.

22.4 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

22.5 The Technical Literature for the StoTherm Masonry Insulation System has been examined by BRANZ and found to be satisfactory.

Quality

23.1 The manufacture of the plasters and paints has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

23.2 The quality management system of the plaster and paint manufacturer, Sto AG, has been assessed and registered as meeting the requirements of ISO 9001: 2008.

23.3 The environmental management system of Sto AG has been assessed and registered as meeting the requirements of ISO 14001: 2004.

23.4 Sto External Wall Insulation Systems are the subject of a current British Board of Agrément [BBA] Certificate No 95/3132 Sto External Wall Insulation Systems, and the manufacture of the systems continues to be checked by the BBA during the validity period of the Certificate. Plasters and paints used within the StoTherm Masonry Insulation System and imported by Stoanz Limited are covered by the BBA Certificate.

23.5 The quality control system of the Sto LevelLite plaster manufacturer has been assessed and registered as meeting the requirements of the Telarc Q-Based Code by Telarc Limited.

23.6 The quality of materials, components and accessories supplied by Stoanz Limited are the responsibility of Stoanz Limited.

23.7 Quality on site is the responsibility of the Stoanz Limited approved applicators.

23.8 Designers are responsible for the building design, and building contractors are responsible for the quality of construction and installation of the solid substrates, joinery, flashing tapes, airseals and joinery flashings in accordance with the instructions of the building designer.

23.9 Building owners are responsible for the maintenance of the StoTherm Masonry Insulation System in accordance with the instructions of Stoanz Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design action – General principles.
- AS/NZS 4858: 2004 Wet area membranes
- NZS 3101: 1995 Concrete structures standard.
- NZS 4210: 2001 Masonry construction: Materials and workmanship.
- NZS 4211: 2008 Specification for the performance of windows.
- NZS 4214: 2006 Methods of determining the total thermal resistance of parts of buildings.
- NZS 4229: 1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Design of reinforced concrete masonry structures.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 [Amendment 5, 1 August 2011].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 3 September 2013.

This Appraisal has been amended to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 3, dated 11 November 2015.

This Appraisal has been amended to update the Appraisal Holders contact details.

BRANZ

In the opinion of BRANZ, StoTherm Masonry Insulation System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Stoanz Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Stoanz Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions.
   d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Stoanz Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Stoanz Limited or any third party.

For BRANZ

Pieter Burghout
Chief Executive

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24 September 2008