

TILE ASSOCIATION OF NEW ZEALAND SYSTEM APPRAISAL PREPARED FOR:

# MJ2 Group Limited

## Litokol Litoproof Extreme

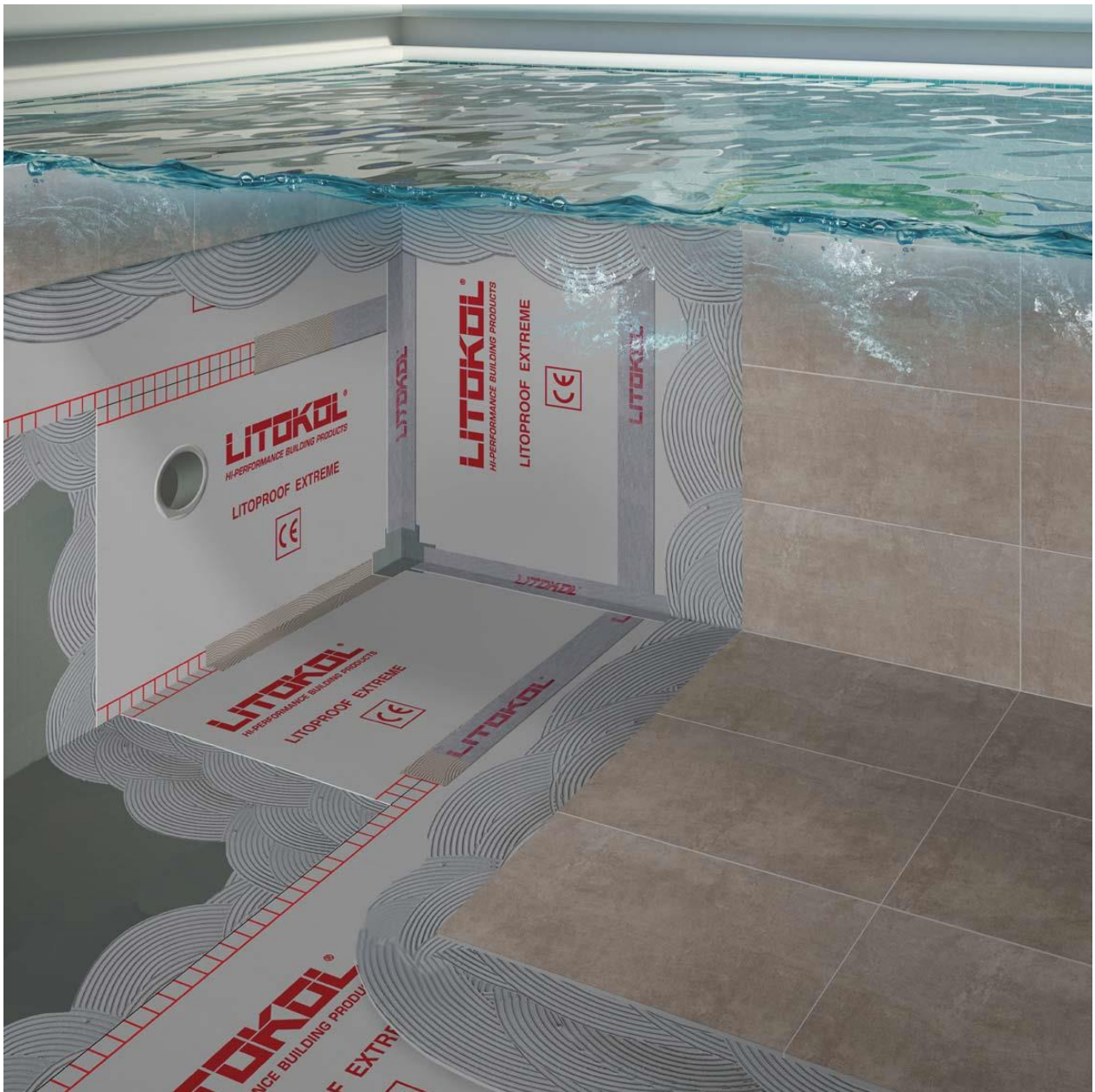
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# LITOPROOF EXTREME





## 1. Scope of this Appraisal

TANZ have appraised the Litokol Litoproof Extreme, flexible sheet, waterproofing membrane system for External applications of structures and buildings, decks and balconies within the following scope:

- The scope of limitations of the NZBC E2/AS1 acceptable solution paragraph 1.1 and including specific engineered designed projects.
- When designed and installed in conjunction with the Litokol Litoproof Extreme technical information.
- With substrates of plywood, fibre cement compressed sheet or suspended concrete slab.
- With minimum falls of decks and balconies of 1 in 40 for plywood substrates and 1 in 60 for concrete substrates
- For decks and balconies of no more than 40 sqm in area that have no integral steps included into the structure and with no water discharging directly onto the finished surface of the deck or balcony area.
- For use with over surface types that are fully supported with pedestal jacks only. No direct adhesive fixing is permitted with the Litokol Litoproof Extreme membrane system. (Refer to NZBC wind zones up to and including extra high zone).
- When used in conjunction with all the Litokol supplied products below, these will form the Litokol "system for waterproofing and installation of ceramics or mosaics in swimming pools with flexible sheets".

### Litokol Litoproof Extreme accessory products

- Litoproof Extreme flexible sheet membrane
- Litosill MS
- Litoband Koll
- Litoband SK Tape
- Litokol tile adhesives in the class of C2/S1-S2
- Litoband SK internal and external corners
- Stylegrout range of products supplied by Litokol
- Ottoprimer 1218
- Ottoseal S70

## 2. Appraised Product

Litokol Litoproof Extreme, is a sheet membrane consisting of two outer layers of non-woven polypropylene that are heat sealed to an inner layer of polyethylene. It is used for interior and exterior waterproofing applications. The scope of this appraisal is for External applications. Refer to the TANZ appraisal 12121 Litokol Litoproof Extreme for Internal use applications.

## 3. Scope of Product

- 3.1 The Litokol Litoproof Extreme, flexible sheet, waterproofing membrane has been appraised by TANZ as an External waterproofing membrane, within the following scope:
- 3.2 On floor substrates of concrete, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay.
- 3.3 On Cement self-levelling floor compound product such as Litoliv S40 ECO, Litoliv Express, Litoliv Extra 15.
- 3.4 On wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems, and wet area plasterboard lining systems.
- 3.5 When a finished surface of ceramic or stone tile is installed above the membrane (refer Scope of this Appraisal above).
- 3.6 When the floor substrate structure has been designed and constructed to ensure that deflections in the substrate do not exceed 1/360th of the span of the building elements used to construct the substrate.
- 3.7 When designed and constructed in accordance with the “TANZ Wet Area Waterproof Membrane and Tile System Installation” methodology.
- 3.8 When movement and control joints in the substrate are carried through the membrane and tile or stone finish surface. (In exterior applications excluding decks and balconies over Litokol Litoproof Extreme membrane supported by pedestal jack systems.)
- 3.9 When installed by Litokol accredited applicators of the membrane product type.

## 4. Product Limitations

- 4.1 When designed and constructed outside of the “TANZ Wet Area Waterproof Membrane and Tile System Installation” methodology.
- 4.2 Tile and Stone finishes are outside of the scope of this product appraisal.
- 4.3 Applications for use in Internal applications have not been assessed in this product appraisal.



- 4.4 See TANZ appraisal #12121 for Litokol Litoproof Extreme Internal appraisal information.

## 5. Building Code Compliance (NZBC)

It is the opinion of TANZ Inc, that the Litokol Litoproof Extreme, flexible sheet, waterproof membrane product when designed and installed in accordance with the information and conditions of this appraisal will meet the following provisions of the NZBC: -

**B2 Durability:** Performance B2.3.1 (b) and B2.3.2

**E2 External Moisture:** Performance E2.3.1 and E2.3.2

**F2 Hazardous Building Materials** Performance F2.3.1

## 6. Durability

Litokol Litoproof Extreme, flexible sheet, membrane, when exposed to normal conditions of the environment and subjected use, are intended to have serviceable minimum life period of 15 years and be compatible with ceramic and stone tile finishes that have a serviceable life of between 15 to 25 years.

## 7. Maintenance

- 7.1 When designed and installed correctly, no maintenance of the Litokol Litoproof Extreme, flexible sheet, membrane is required or is achievable.
- 7.2 A regular check of the finished surfaces must be made to ensure it remains fully adhered to the substrate. Any cracks or damage that may occur must be repaired by a professional tradesperson immediately.

## 8. Fire Prevention

- 8.1 Separation or protection of the Litokol Litoproof Extreme membrane from heat sources such as chimneys, fireplaces and all other heating appliances must be provided for in the design and installation of the appraised system.
- 8.2 NZBC VM-C/VM1 part 7 and C/AS1 - C/AS2 provide methods of separation and protection of combustible materials from heat sources.

## 9. Litoproof Extreme - Product Technical Information

### System Components

- 9.1 **Otto Primer 1218** - Primer to improve the adhesion of grouts and adhesives in continuously wet conditions. Refer to Litokol TDS information n.883 dated March 2021.
- 9.2 **Litoplus K55** – High performance cementitious adhesive with no vertical slip and long open time for the bonding of the Litoproof Extreme membrane to acceptable substrates and for the installation of ceramic, porcelain, mosaics and natural stone in exterior applications. Refer to Litokol TDS information n.011 dated January 2021.
- 9.3 **Litoelastic Evo** – A white two component flexible reactive adhesive for use in adhering the Litoproof Extreme membrane to acceptable substrates. Refer to Litokol TDS information n. 206 October 2021.
- 9.4 **Litoproof Extreme** – A sheet membrane that is, consisting of two outer layers of non-woven polypropylene that are heat sealed to an inner layer of polyethylene. It is available as a 1.0m wide by 10m or 30m long roll and has a white appearance. Refer to Litokol TDS information n. 1 dated January 2021.
- 9.5 **Litoband Koll 1K** – An adhesive component used to adhere Litoband tape. Refer to Litokol TDS information n.617 dated January 2012 for correct installation methods.
- 9.6 **Litoband Tape** – A double layer of polyester fabric in butyl rubber centre, used for sealing of junctions between horizontal and vertical surfaces. Refer to Litokol TDS information n.611 dated January 2021 for correct installation methods.
- 9.7 **Litoband SK Corner IC-EC** - A thermoplastic elastomeric fabric coupled with two layers of non-woven polypropylene used for sealing internal and external corners. Refer to Litokol TDS n.623 dated November 2021.
- 9.8 **Stylegrout Tech** – Flexible, multipurpose cementitious grout for use in grout joints up to 20mm wide. Refer to Litokol TDS information n.330 dated January 2021.
- 9.9 **Otoseal S105** – Single component acetic acid cross linking silicon sealant. Refer to Litokol TDS information n.813 dated March 2021.

## 10. Handling and Storage

- 10.1 All materials must be stored inside in a dry, frost-free environment out of direct sunlight. Materials must be stored up off concrete floors and cannot be exposed to freezing conditions.
- 10.2 These products have a 24-month shelf life from date of manufacture in the original unopened packaging.





- 10.3 Once opened, in general, the materials must be used within 3 months. Refer to Litokol product information for specific time periods of opened individual products.

## 11. Litokol Technical Literature

- 11.1 The Litokol Litoproof Extreme technical literature must be read in conjunction with this appraisal.
- 11.2 All aspects of the appraisal information pertaining to the scope, design, installation, and maintenance, must be followed.
- 11.3 Accompanying technical literature supporting this appraisal has been used in the assessment of the Litokol Litoproof Extreme, flexible sheet, membrane product.

## 12. Design Information

### General

- 12.1 The Litokol Litoproof Extreme, flexible sheet, waterproofing membrane, has been appraised by TANZ for use as an under-tile waterproof membrane. To complete the full system the accessories nominated in section 7 of this document must be used.
- 12.2 The Litokol Litoproof Extreme membrane is for use in buildings where an impervious waterproof membrane is required to Exterior floor and wall areas as defined in NZBC-E2 External moisture to prevent damage to building elements and adjoining structures.
- 12.3 The "TANZ Wet Area Waterproof Membrane and Tile System Installation" design information must be utilised in the design of External wet areas that utilise the Litokol Litoproof Extreme, flexible sheet, waterproofing membrane product.
- 12.4 Movement and control joints may be required to satisfy the design requirements of a projects size and shape and the stone or tile finished surface.
- 12.5 The installed membrane must be protected prior to and during installation of a stone or tile finished surface.
- 12.6 Timber framed systems must comply with: -
- NZS 3604.
- 12.7 When a specific engineered design (SED) has been utilised, the framing elements must be at least the equivalent stiffness to the framing provisions, outlined in
- NZS 3604 or comply with the serviceability scope of AS/NZS 1170.



- 12.8 In all substrates uses, structural framing must be provided so that the maximum span of the substrate meets all requirements of the substrate manufacturers technical information.
- 12.9 All sheet edges of the substrate must be fully supported, unless stated otherwise in the manufacturers technical and installation information and the provided test data to support a claim is available to view and complies to an appropriate standard or verification method.
- 12.10 The timber framed systems that support the substrate must be constructed to prevent deflection in the substrate from exceeding 1/360<sup>th</sup> of the span.
- 12.11 Where NZS 3604 has been utilised, the allowable joist spans that are nominated in Table 7.1 shall be reduced by 20%.

## 13. Substrates

### Concrete and masonry

- 13.1 All concrete and masonry substrates must be to specific engineering design (SED) meeting the requirements of the NZBC and the following NZS requirements:
- NZS 3101 Concrete Structures Standard
  - NZS 3604 *must meet concrete slab on ground requirements* (or)
  - NZS 4229 Concrete masonry buildings not requiring specific engineering design
  - NZS 4230 Design of reinforced concrete masonry structures

### Plywood

- 13.2 Plywood must be a minimum of 17mm thick and comply with
- AS/NZS 2269 Plywood-structural
- 13.3 CD grade structural with the sanded C face installed upwards.
- 13.4 Treated H3 CCA treated.
- 13.5 LOSP treated plywood must not be used.
- 13.6 Plywood substrates must be supported with nogs/dwangs or framing with a maximum span of 400mm in each direction.
- 13.7 Fixed with 10g x 50mm stainless steel countersunk head screws, fixed at 150mm centres along the sheet edges and 200mm centres through the body of the sheet.

### Fibre Cement Compressed Sheet and Fibre Cement Sheet Tile and Slate Underlay

- 13.8 Plywood sheets must comply with NZBC Acceptable solution E2/AS1 clause 8.5.3 and 8.5.5.



#### Fibre Cement Compressed Sheeting

13.9 All fibre cement sheet products must be manufactured to the requirements of: -

- AS/NZS 2908.2 Cellulose-Cement Products-Part 2: Flat sheets type B cat 3+

13.10 Must be specified by the manufacturer as being fit for purpose for External use.

13.11 The fibre cement sheet must be of a thickness to meet the specific structural design requirements and must be secured to the structure to resist wind uplift and all other forces acting on the deck or balcony, pertaining to deflection from gravity and live loads.

13.12 Installation must be carried out in accordance with the supplied manufacturers installation and product technical information and all test data confirming suitability for the intended use of the product.

13.13 Membrane installation must not proceed where the substrate surface temperature is below 10°C or above 35°C.

#### Concrete

11.13 Concrete substrates must of a specific engineering design meeting the requirements of the NZBC and to NZS 3101 Concrete Construction.

## 14. External Moisture

14.1 The Litokol Litoproof Extreme, flexible sheet, waterproofing membrane has been independently tested and is deemed to be impervious to water as per: -

- BS EN 13956:2012 – Flexible sheets for Waterproofing - Requirements, test methods, evaluation of conformity, classification, and designation.

14.2 Decks and balconies must be designed and constructed to shed moisture. They must also be designed to take into account snowfall in snow prone areas.

14.3 A review undertaken by TANZ of the Litokol Litoproof Extreme membrane technical literature and all of the associated products that form the system, has been conducted and are deemed to be compliant with NZBC clause E2.3.1.

14.4 TANZ can confirm that the Litokol Litoproof Extreme system technical literature reviewed aligns with the information outlined by NZBC Acceptable Solution E2/AS1.

14.5 When installed to the requirements of this appraisal and to the technical information supplied by the manufacturer the Litokol Litoproof Extreme membrane system will prevent the penetration of water and will therefore in the opinion of TANZ comply with NZBC clause E2.3.2.

- 14.6 As the Litokol Litoproof Extreme membrane is impermeable, a means of dissipating construction moisture must be provided in the building design and construction to be compliant with NZBC E2.3.6.
- 14.7 The minimum fall to decks and balconies is 1 in 40 for plywood and 1 in 60 for concrete. The minimum fall to gutters is 1 in 100 and all falls must slope to an outlet.
- 14.8 Deck and balcony falls must be built into the substrate and not created with mortar screeds that are applied over the waterproof membrane.
- 14.9 Design allowances must be considered to allow for deflection and settlement of the substrate to ensure that the outlined falls are maintained, and no ponding water will be present.
- 14.10 All outlets and overflows must have a drainage flange installed and must be fitted with a grate or cage to reduce the build-up of detritus that can lead to blockages.
- 14.11 An overflow must be provided in the deck or balcony substrate where it does not drain to an external gutter or spouting.
- 14.12 All penetration and upstands that are incorporated into a deck or balcony design must be raised above the level of the overflow allowance.
- 14.13 Specific design projects that are outside of the scope of the Litokol Litoproof Extreme membrane system TDS information and are not covered under the requirements of this appraisal.
- 14.14 No direct adhesive fixing of tile or stone finish is permitted to the Litokol Litoproof Extreme membrane for deck and balconies installations where the area is constructed with timber framing over a lower dwelling as per the requirements of E2 7.3.1.1. For all applications a pedestal jack system must be used.
- 14.15 Where the Litokol Litoproof Extreme is being applied for areas that are not constructed over a lower dwelling, the finished product can be directly adhered to the membrane using the appropriate adhesive.

## 15. General Installation Information

### Skill Level Requirement

- 15.1 The installation of the framing and substrate must be completed by, or under the supervision of a Licenced Building Practitioner (LBP) with the relevant Licence class and in accordance with information contained inside this appraisal and the manufacturers supplied technical information.
- 15.2 The installation of the Litokol Litoproof, flexible sheet, waterproofing membrane must be performed by Litokol approved applicators who have completed the



required product training of the membrane type, have a good knowledge of the Litokol Litoproof Extreme, flexible sheet, product technical information, and can demonstrate good waterproofing practices.

## 16. Substrate Preparation

### General

- 16.1 All installed substrate types must be dry, free of dust/dirt and any grease/oils and detritus.
- 16.2 Are installed to the requirements of this appraisal and to the manufacturers supplied information.
- 16.3 Substrate surfaces must be even in plane and be free from nibs and sharp edges and concrete formwork release agents.
- 16.4 Wall substrates must be flat and true over a 4.0m straight edge placed in any direction of the wall area.
- 16.5 The relative humidity of the concrete substrates must be 75% or less before the application of the Litokol Litoproof Extreme, flexible sheet, waterproof membrane
- 16.6 All voids, cracks, holes, rough areas must be filled with an appropriate type of material that is compatible with the installed substrate type. Refer to Litokol TDS n.609 dated January 2021.
- 16.7 All joints, junctions of substrate intersections at wall to floor and wall to wall areas are prepared, primed, and have the appropriate Litoproof Extreme, waterproof membrane accessories installed to the Litokol Litoproof Extreme technical information requirements.
- 16.8 All falls meet the requirements as set out in this appraisal.
- 16.9 All drainage outlets are installed correctly and have positive fall directed towards them.

### Use of Primer

- 16.10 Smooth and compact substrates such as existing ceramic or agglomerate coverings, must be properly degreased with specific detergents such as Litoscrub EVO
- 16.11 In the case of anhydrite screeds, check for the presence of a suitable vapour barrier to prevent rising damp.
- 16.12 Use a carbide method hygrometer to check that the residual humidity is less than 0.5%.
- 16.13 The surface must be sanded and treated with Primer C
- 16.14 Any cracks must be repaired with Multifondo EVO, sprinkling the fresh surface with sand or dried quartz with granulometry 0.4-1 mm.
- 16.15 All Litokol respective technical data sheets must be consulted for correct use of the indicated products.

16.16 In the case of cementitious substrates that produce surface dust, these must be treated beforehand with the ready to-use consolidating primer in aqueous dispersion, Primer C. Refer to Litokol TDS information sheet N.515 dated January 2021.

## 17. Membrane Installation

### Application

- 17.1 The choice of adhesive used to fix the membrane to the substrate depends on the type of substrate itself. For most substrates, it is nonetheless possible to use an adhesive in class C2 according to UNI EN 12004.
- 17.2 For the correct choice of adhesive, refer to the technical data sheets of the products intended for use for the specific substrate type.
- 17.3 Apply the correctly selected adhesive type onto the substrate using a suitable 3.5 mm notched trowel.
- 17.4 Lay the previously cut-to length sheet of Litoproof Extreme, respecting the indicated open time of the adhesive, compressing it with a smooth round-edged trowel or specific pressure roller from the centre outwards, squeezing out any excess adhesive and avoiding the formation of air bubbles or folds.
- 17.5 The sheets must be laid next to each other, using the centimetre markings on the edges of the Litoproof Extreme membrane for correct positioning.
- 17.6 After installation, immediately protect the surface of the membrane from foot traffic and any mechanical damage.

### Sheet Joining Application

- 17.7 It is not necessary to wait for the adhesive type used to install the Litoproof Extreme membrane to set before sealing the sheet joints.
- 17.8 Seal the joints between the sheets of the Litoproof Extreme membrane using the Litoband SK Tape band, bonding it to the sheet with the waterproof Litoband Koll adhesive, applied using a 3.5 mm notched trowel.
- 17.9 After applying the Litoband Koll adhesive, lay the Litoband SK Tape and apply firm pressure with a smooth round edged steel trowel to avoid the formation of air bubbles or folds.
- 17.10 After installation, immediately protect the surface of the membrane from foot traffic and any mechanical damage.

### Alternative Method – Sheet Joining Application

- 17.11 Seal the joints between the sheets using the Litoband SK Tape band, bonding it to the sheet with the hybrid MS polymer adhesive Litosil MS, applied using a 2 mm notched trowel.



17.12 After applying the Litosil MS adhesive, lightly spray the surface with water for rapid cross-linking and lay the Litoband SK Tape, applying firm pressure with a smooth round-edged steel trowel to avoid the formation of any air bubbles or folds.

17.13 After installation, immediately protect the surface of the membrane from foot traffic and any mechanical damage.

Sealing of Penetrations and Through Elements

17.14 Near drains and pipework, cut out the Litoproof sheeting with the necessary diameter.

17.15 In the presence of pipework, drains, spotlights, etc., lay the special Litoband SK Pipes Collar and Litoband SK Self Adhesive Drains Collar pieces.

17.16 For the sealing of pipework, install the Litoband SK Pipes Collar accessories in a suitable diameter.

17.17 Fix the Litoband SK Pipes Collar gaskets to the Litoproof membrane with the MS-polymer-based hybrid adhesive, Litosil MS, applied with a 2 mm notched trowel.

17.18 After applying the Litosil MS adhesive, lightly spray the surface with water for rapid cross-linking and lay the Litoband SK Pipes Collar gaskets, applying firm pressure with a smooth round-edged steel trowel to avoid the formation of any air bubbles or folds.

Alternatively:

17.19 Fix the Litoband SK Pipes Collar gaskets to the Litoproof Extreme membrane with the Litoband Koll adhesive applied with a 3.5 mm notched trowel.

17.20 After applying the Litoband Koll adhesive, apply the Litoband SK Pipes Collar gaskets and apply firm pressure with a smooth round-edged steel trowel to avoid the formation of any air bubbles or folds.

17.21 Floor drains must be sealed with the Litoband SK Self-Adhesive Drains Collar sheet in self-adhesive butyl, bonded directly to the Litoproof Extreme sheet after creating a hole in the middle with the same diameter as the drain, using a cutter.

Alternatively:

17.22 For the sealing of pipework and through-elements in general with irregular sizes and/or shapes, create a connecting bead between the element and the waterproof membrane with the ready-to-use adhesive grout Litosil MS.

17.23 For correct use of the products to be used, always refer to the respective Litokol technical data sheets.

Sealing of Perimeter

17.24 On any internal and external corners, apply the special pieces in self-adhesive butyl, Litoband S.A.T. – AI (internal corner) and Litoband S.A.T. – AE (external corner).

1. Partially remove one of the two protective liner tabs and position the corner, pressing hard from the innermost point outwards, avoiding the formation of folds or air bubbles.

2. Remove the other liner tab and complete the operation. Then position the Litoband S.A.T. tape along the entire floor-to-wall junction after cutting it to the desired length, overlapping it by at least 5 cm over the internal and external corners previously applied.
3. Once again, partially remove the protective liner and fix the tape onto the horizontal part of the junction, avoiding the formation of folds or any air bubbles.
4. Remove the other half of the protective liner and fix the tape onto the vertical part of the junction. Litoband S.A.T. must also be applied along the perimeter in order to seal the junction between the Litoproof Extreme sheeting and the base of any perimeter profiles in aluminium or steel with drip channel.

Alternatively:

1. Apply the Litoband Koll waterproof adhesive with a 3.5 mm notched trowel on the corners and install the internal and external corners, Litoband SK Corners IC and EC.
2. After applying the Litoband Koll adhesive, lay the special Litoband SK Corners IC and EC pieces and apply firm pressure with a smooth round-edged steel trowel to avoid the formation of air bubbles or folds.
3. Similarly, install the previously cut-to-size Litoband SK Tape sealing tape over the fresh layer of Litoband Koll on all wall-to-wall and wall-to-floor corners, overlapping it by a few centimetres over the Litoband SK Corners IC and EC.
4. After applying the Litoband Koll adhesive, lay the Litoband SK Tape and apply firm pressure with a smooth round edged steel trowel to avoid the formation of any air bubbles or folds.
5. For correct use of the products to be used, always refer to the respective technical data sheets.
6. After installation, immediately protect the surface of the membrane from foot traffic and any mechanical damage.
7. After waterproofing and overlapping as necessary on the corners and junctions, the finished surface can be installed.
8. It is not necessary to wait for the adhesive used to install the membrane to set before installing the covering.
9. For the correct choice of adhesive, refer to the Litokol technical data sheets of the products.

## 18. Tiling- Over Surface Finish

- 18.1 It is not necessary to wait for the selected adhesive used to install the membrane to set before installing the system accessories. Ceramics, natural stones, or mosaics can be installed with cementitious adhesives in class C1/C2 or reactive in class R2 according to UNI EN 12004.





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- 18.2 The choice of adhesive depends on the size of the tiles and expected operating conditions.
  - 18.3 In the case of large tiles (side > 60 cm), it is preferable to use deformable adhesives in class S1 or highly deformable adhesives in class S2.
  - 18.4 The tiles must be installed with a solid bed using the back-buttering technique, with joint widths suited to their size. Spot fixing techniques must not be used.
  - 18.5 For the correct choice of tile or stone adhesive, refer to the technical data sheets of the products.
  - 18.6 No direct adhesive fixing of an over surface finish is permitted.

## 19. Basis of the Appraisal

- 19.1 The following information supplied by Litokol has been reviewed by TANZ and the test data results, form the basis of this appraisal for the product “Litoproof Extreme” flexible sheet waterproof membrane. (Table 1)
- 19.2 The following information has been utilised by TANZ to determine compliance to the NZBC and the relevant Acceptable Solutions of E2 External Moisture as outlined in this appraisal.
- 19.3 A review of the Test results independently conducted on behalf of Litokol, has been undertaken by TANZ and found to be satisfactory to comply with
  - AS/NZS 4858: 2004 wet-area membranes
  - Cyclic movement, adhesion to substrates, resistance to aging, resistance to water, resistance to chemicals and water absorption
- 19.4 A review of the Litokol Litoproof Extreme technical information, installation methods and scope of use, has been undertaken by TANZ and found to be satisfactory to comply with
  - AS 3740: 2010 Waterproofing of domestic wet areas
  - E3/AS2
- 19.5 It is the opinion of TANZ that the when the Litokol Litoproof Extreme membrane is used, designed, installed, and maintained to the extent of this appraisal information, is deemed fit for purpose as an under-tile waterproof membrane.
- 19.6 It is the opinion of TANZ that the when the Litokol Litoproof Extreme membrane is used, designed, installed, and maintained to the extent of this appraisal information, and used in conjunction with the information outlined in this appraisal, it is deemed fit for purpose as a “Waterproofing and Tile Installation System”.

### Further Investigations

- 19.7 Litokol have achieved the following accreditations
  - 1. Quality Management System standard: UNI EN ISO 9001:2015 (ISO 9001:2015). This certificate is valid for the following scope: Design, manufacture, service and

sale of adhesives, sealants, adhesive paste, and additives for the building sector; trade of tiling accessories (EA Sector: 12)

2. EPD - Environmental Products Declaration - Environmental Products Declaration, which provides environmental data on the life cycle of the products in accordance with the international standard ISO 14025.

The International EPD System is a program allowing the development and registration of EPDs for all types of goods and services. The system is international and certified by a third party.

3. The results of the study and other information, as required by the PCR, are then reported in the EPD format. The EPD developed as such is then verified by an accredited independent body. Litokol have utilised.
4. **UL Underwriters Laboratories Inc.**, an independent safety certification company, which develops standards and tests for products, materials, components, and instruments, with a particular focus on safety. The EPDs are then inserted in the UL portal and can be accessed by a vast network of companies.
5. GBC - Green Building Council – The Litokol products acquire points for LEED certification (Leadership in Energy and Environmental Design), the US system used to classify the energy efficiency and ecological footprint of buildings, developed by the GBC (Green Building Council) of which Litokol is a part, providing a set of measurement standards to assess sustainable constructions in terms of their environmental impact.
6. GEV Emicode EC1 PLUS - Litokol products come with EMICODE EC1 PLUS certification and labelling, for “products with a very low volatile organic compound emission rate” in compliance with the guidelines issued by GEV (association for the control of building material emissions), with much lower values than the limit values.



Table 1

PERFORMANCE

Compliance	EN 13956	
Longitudinal tensile strength	390 N/50 mm	EN ISO 527-3
Lateral tensile strength	140 N / 50 mm	EN ISO 527-3
Longitudinal elongation at break	55%	EN ISO 527-3
Lateral elongation at break	130%	EN ISO 527-3
Longitudinal pull-off strength	65 N	EN 12310-2
Shear pull-off strength	140 N	EN 12310-2
Resistance to water pressure	≥ 1.5 bar	DIN EN 1928 version B
Resistance to UV rays	≥ 450 h	EN ISO 4892-3
Water vapour permeability "Sd"	≥ 50 m	EN ISO 12572
Reaction to fire Class	B2	EN 4102

CHEMICAL RESISTANCE TABLE

Active substance	( + = resistant / 0 = weakened / - = non-resistant)	
Hydrochloric acid at 3%	+	Internal method
Sulphuric acid at 35%	+	Internal method
Citric acid 100 g/l	+	Internal method
Lactic acid at 5%	+	Internal method
Potassium Hydroxide at 3%	+	Internal method
Potassium Hydroxide at 20%	+	Internal method
Sodium hypochlorite 0.3 g/l	+	Internal method
Salt water (20g/l Sea salt water)	+	Internal method
Alkalis	+	ETAG 022
Alkalis 28d - 40°C - 3%	+	AbP

