DRYSULATION

**MINERAL BASED SYSTEM FOR INSULATION
OF EXTERNAL BUILDING WALLS
USING EPS BOARDS**

dryvit®

DS 02.3.01

INSTALLATION INSTRUCTIONS

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I. INTRODUCTION

A. The instructions contained herein describe the various steps of the installation process associated with the thermal insulation of external walls using the Dryvit Drysulation system. The contractor, prior to starting work, should also become acquainted with the following documents:
   1. ITB Technical Approval AT-15-2717/2003
   2. Product data sheets DS. 02.4.01 to 05.
   3. Construction details DS.02.2.00.
   4. The external wall insulation design.

B. Work associated with the Dryvit Drysulation system should be carried out by an experienced contractor holding a current training certificate* issued by Dryvit.

II. INITIAL STEPS

A. The contractor, prior to commencing work, should present to the owner/architect samples of all colours and textures described in the design for approval. Samples should be prepared from the same materials, using the same tools, equipment and techniques that will be used on the actual facade. The approved samples should be retained and made available at the construction site.

B. The contractor should become thoroughly acquainted with the design and clarify all doubts associated with used solutions, mechanical joiners and others.

III. ELEMENTS OF THE DRYVIT DRYSULATION SYSTEM

A. Adhesives for installation of EPS boards
   1. Dryhesive PLUS mineral modified adhesive
      a. A high-quality cement-based adhesive modified with synthetic resins that after mixing with water gives a ready-to-use adhesive for gluing of EPS boards to mineral substrates. Detailed information maybe found in data sheet DS 02.4.01.

B. Thermal insulation layer
   1. PS-E FS 15 1000 x 500 mm EPS boards with a thickness of between 20 and 200 mm that comply to Dryvit standards - see data sheet DS 00.6.06. Conform to PN-EN-13163: 2004 (EPS 70040 Fasada or EPS 80 036 Fasada).

C. Base layer
   1. Drycoat mineral modified adhesive
      a. A high-quality cement-based adhesive modified with synthetic resins that after mixing with water gives a ready-to-use adhesive for embedding of reinforcement mesh onto the external surface of the insulation layer.
   2. Blue reinforcement mesh with black "Dryvit" lettering; resistant to alkali and made of specially prepared fibreglass to ensure compatibility with other system materials. Mesh is classified according to impact resistance of base layer and is available in the following versions:
      a. Standard Plus,
      b. Panzer.

D. Dryvit facade finish - should be of the colour and texture approved by the architect and owner.
   1. Drytex modified facade finishes
      a. Dry mineral mixes enhanced with synthetic resins that give a high-quality finish after mixing with water. Available in three textures: Quarzputz, Sandblast, Sandpebble.

   NOTE: *Finishes should be painted with Silstar silicone, Colorsil silicate or Demandit acrylic paint.*
   2. Facade paints
      a. Acrylic, polymer based, Demandit paint available in the entire Dryvit line-up,
      b. Silstar silicone facade paint available in the entire Dryvit line-up,
      c. Colorsil silicate facade paint is available in certain Dryvit colours.

E. Other materials
   1. Starter strips:
      a. made of stainless steel, aluminium or PCV, according to insulation thickness,
      b. corner strips made of stainless steel, aluminium or PCV.
   2. Installation kit:
      a. Impact mechanical joiners,
      b. plastic joiners together with PCV distancing washers.
   3. Stainless steel, aluminium or PCV corner strips (with or without reinforcement mesh).
   4. Clean water
   5. Mechanical joiners (if required by project).

6. Weather-stripping materials.

IV. DELIVERY, STORAGE

A. All Dryvit materials should be delivered to the site in original, sealed packages with undamaged labels. Do not use questionable materials.
B. The minimum temperature for storage of paints
   1. Demandit is +7°C, storage time: 2 years from the date of manufacture shown on the packaging; pail should be protected against direct sunlight.
   2. Silstar and Colorsil +7°C, storage time: 12 months from the manufacturing date provided on packing.
C. Adhesives and finishes should be stored in original packaging and be protected against moisture. Adhesives should not be stored for more than 6 months from the date of manufacture shown on the packaging.

V. WORK CONDITIONS

A. Air and substrate temperature during work and at least 24 hours following completion should be at least +4°C (+7°C during painting). The finish should be protected against water and damage during this time.
B. All surfaces not being worked on should be protected against dirt.
C. Temporary protection of all metal work and weather-stripping work should be ensured until such works are completed.
D. Installation work should be coordinated with other renovation and construction work.
E. Capillary moisture cannot be found inside the building.
F. The building should be free of defects that could make proper functioning of the insulation system impossible.
G. The distance between scaffolding and wall should be in accord with work safety standards with anchors being installed with a slope away from the wall in order to ensure proper evacuation of water.

VI. EVALUATION AND PREPARATION OF SUBSTRATE

A. The Drysulation system may be used on the following mineral substrates: concrete, reinforced concrete, aerated concrete, bricks, hollow bricks.
B. Check vertical slope of wall in a few places and decide, together with architect or investor, methods of their alleviation in case of significant differences.
C. Make sure that the substrate is:
   a. Clean, dry, even within +/- 6 mm within a 1,2 m radius, free of tarnishes, blooming, blistering paint and other substances that could reduce adhesion. Maximum sag L/240.
   b. Same as in design. Free of capillary and technical moisture. Mineral substrates should cure for at least 28 days.
D. Small defects and roughness may be filled using Dryvit levelling mass. Weak, blistering substrates maybe strengthened with Strongsil.
E. Conduct a test of adherence of Dryhesive PLUS adhesive to substrate prior to commencing adhesion of EPS boards to substrate.
   1. Glue three pieces of EPS board (100 x 100 mm) to substrate surface in various places and leave to dry for three days.
   2. Conduct a ripping test after three days.
   3. If the EPS boards separate, the substrate is sufficiently strong. If the adhesive separates from the substrate, the substrate is too weak and the use of Primax to increase adhesion should be considered. If a thin layer of substrate is pulled away, the substrate should be primed using Strongsil and the test conducted again. If a fragment of the substrate is pulled away, this means that the substrate is too weak and other methods of installation of EPS boards should be considered, e.g., adhesive-mechanical or mechanical.

VII. MOUNTING OF INSULATION BOARDS

A. Check if EPS boards meet Dryvit requirements (see data sheet DS. 00.6.06). Under no conditions should discoloured, warped or unevenly cut boards be used.
B. Installation of EPS boards should be commenced after the bottom edge of the system has been secured: use appropriate starter strips or Standard mesh rolled-out from underneath the EPS surface. Work in both cases should be started with the drawing of a horizontal line which will constitute the bottom edge of the system.

1. Securing of system edges using reinforcement mesh.
   a. Mix Dryhesive Plus adhesive with water according to instructions found in data sheet DS. 02.4.01. Working time of the ready-to-use adhesive is approximately 1 h depending on atmospheric conditions.
   b. Apply a strip (50 mm wide) of Dryhesive PLUS above this line and then apply a 0.4 m strip of mesh in such a way, that mesh will be rolled-out from under the first row of insulation boards after they are installed.
2. Installation of starter strip.
   a. The starter strip should be installed in such a way that its lower edge cover the previously drawn horizontal line.
   b. Use joiners hammered in every 30 cm for installation.
   c. Surface roughness should be alleviated using PCV distancing washers.
   d. Strips should be connected using plastic joiners.
   e. Install corner strips on building corners.

C. Mix Dryhesive PLUS adhesive with water according to instructions found in data sheet DS. 02.4.01. Working time of the ready-to-use adhesive is approximately 1 h depending on atmospheric conditions.

D. Dryhesive PLUS adhesive should be applied to boards using the "stripe and point" ("frame and patch") method.
   1. Frame: width approx. 5 cm, appropriate thickness, 6 patches of appropriate thickness, diameter approximately 10 cm inside of frame.

NOTE: *Binder should only be applied to EPS tiles and never the substrate.*

E. Apply the tiles immediately to the substrate after this and press the tile next to its adjacent tiles, taking care to ensure that no adhesive is found between the tiles.

F. Tiles should be attached in a brick pattern and overlap at building corners.

G. Dilation gaps.
   1. Dilation should be carried out in accordance with places indicated in the design as well as building dilation gaps.
      a. A strip of meshing should be attached along the length of the dilation gap prior to the installation of EPS boards, with such strip being rolled out onto the board surface in subsequent steps (rollout width at least 60 mm).
      b. The side edge of the board (from the side of the joiner) as well as part of its surface should be covered with Dryhesive.
      c. Mesh strips visible from under the surface should be embedded in fresh adhesive using a stainless trowel.
      d. Dilation strips may also be used to execute dilation:
         - leave a dilation gap of approximately 20 mm between tiles during their installation ,
         - cover the tile surface at edges of the dilation gap with a 2 mm coat of Drycoat M adhesive and width of approximately 60 mm on each side .
         - install the dilation strip into the gap, embedding the strip edge into the previously prepared adhesive,
         - cover the insulation board surface with Drycoat after embedding the dilation strip and embed mesh (see item VIII).

H. Compensation joiners.
   1. Compensation joiners should be made in places where system materials join with other materials.
      a. A strip of meshing should be attached along the length of the dilation gap prior to the installation of EPS boards, with such strip being rolled out onto the board surface in subsequent steps (rollout width at least 60 mm).
      b. The side edge of the board (from the side of the joiner) as well as part of its surface should be covered with Dryhesive.
      c. Mesh strips visible from under the surface should be embedded in fresh adhesive using a stainless trowel.

I. Doors, windows and other façade openings

1. The thermal insulation layer should be separated from frames and other mechanical elements through the use of appropriate compensation gaps. See VII.I and Dryvit Drysulation data sheet DS. 02.2.00.
2. Thermal insulation boards should be installed around all aperture frames in a manner preventing their edges to be continuations of aperture edges. See construction details regarding the Dryvit Drysulation system. Installation of EPS boards in such a manner will reduce the risk of cracking.
3. The corners of all openings should be additionally reinforced using 25 x 30 cm strips of mesh embedded diagonally. See data sheet DS. 02.2.00. A strip of mineral wool having a width of approximately 300 mm and appropriate length (at least 300 mm wider on each side than facade opening) may be used as additional fire protection. This though is not necessary.

J. The EPS boards should create a homogenous thermal insulation layer.
1. All cracks exceeding 1.5 mm should be filled with thermal insulation materials, e.g., appropriately cut slivers of EPS board.
2. Gaps should not be filled with adhesive.

K. The insulation layer must be even.
1. The surface should be checked using lat of at least 2.5 m.
2. Remove all unevenness exceeding 1.5 mm with the help of a trowel with sandpaper. The entire EPS board surface should be sanded.

NOTE: *Use circular sanding motions, never parallel to board connections. Dust should be carefully removed.*

L. Rustification work foreseen in the project should be carried out at this time.
1. Define the rustic line using a string.
2. Channels of the shape should be at this time using a long guide bar and rustic tool.

NOTE: *Channels should be of such depth that the remaining thermal insulation level is at least 25 mm thick.*

3. Embed strips of reinforcement mesh along the entire length of rustic channels. Meshing should have a width sufficient to ensure that it is also embedded on the surface of EPS boards – at least 6 cm on each side of rustic works.
4. Rustic strips maybe used as an alternative.

M. The use of mechanical joiners in case of standard work and proper preparation of substrate is not required. Mechanical attachment should only be carried out in accordance with architect recommendations if such installation is foreseen in the project.
1. The number, placement and type of joiners to be used should be defined in the project.
2. Joiners may be hammered in only after the adhesive has fully dried, however no sooner than after 24 hours from the time boards have been attached.

VIII. EMBEDDING OF REINFORCEMENT MESH

A. The surface of EPS boards should be checked prior to starting the embedding of reinforcement mesh.
1. Possible roughness should be smoothed in accordance with item VII.K.
2. Fill defects.
3. Depressions formed in places where mechanical joiners have been used should be filled with Drycoat adhesive.

B. Façade surfaces not exposed to impact should have a standard base layer installed using Standard reinforcement mesh. In order to do this:
1. Prepare Drycoat adhesive in accordance with instructions contained in data sheet DS. 02.4.02.
2. Spread a continuous layer of Drycoat adhesive using a stainless trowel on a surface slightly larger than the width and length of the cut reinforcement mesh and thickness of approximately 1.5 mm. 3. The reinforcement mesh should be immediately embedded in the freshly laid adhesive using the same trowel with the help of movements along fibres from the inside to the outside edges. The mesh should be completely embedded and its colour not visible on any surface. Places, where the mesh colour can be seen, should be covered with a thin layer of Drycoat.
4. Mesh should be laid with overlaps of at least 60 mm. Only such laying of mesh will ensure proper carrying of loads by the base surface.

5. Mesh should overlap 200 mm on each wall on internal building corners. See details in data sheet DS 02.2.00.
6. External corners should be secured in one of the following ways:
   a. Embed the mesh with an overlap of 200 mm on each wall.
   b. Glue corner strips with reinforcement mesh or corner strips with Panzer mesh prior to embedding mesh. Embed a single layer of Standard mesh after the adhesive has dried.
7. A base layer prepared in such a manner should be protected against moisture and be left to dry for a period of approximately 24 h, (20℃ and 55% relative humidity).

C. The use of Panzer mesh in places exposed to impact, e.g., balconies and in the vicinity of communication tracts, is recommended prior execution of the standard base layer.
In order to do this:
1. Prepare Drycoat adhesive in accordance with instructions contained in data sheet DS. 02.4.02.
2. Spread a continuous layer of Drycoat adhesive using a stainless trowel on a surface slightly larger than the width and length of the cut reinforcement mesh and thickness of approximately 2.0 mm.
3. Panzer reinforcement mesh should be immediately embedded in the freshly laid adhesive using the same trowel with the help of movements along fibres from the inside to the outside edges.
4. Due to its thickness, Panzer mesh should not overlap but be installed edge-to-edge.
5. A Panzer layer prepared in such a manner should be protected against moisture and be left to dry for a period of approximately 24 h, (20℃ and 55% relative humidity).
6. Next, embed Standard mesh in accordance with instructions given in item VIII.B. If Panzer mesh has been applied in horizontal strips, Standard mesh should be applied in vertical strips.

APPLICATION OF DRYVIT FINISH

A. Application of Drytex finishes
1. The base layer, prior to commencing application of the Drytex finish, should be dry, even and well bound. Drying time of the base layer is 24 hours (+20℃, 55% relative humidity) but may be longer under inferior weather conditions. Check to ensure that the mesh has been fully embedded and sand all roughness with sandpaper.
2. Preparing the Drytex finish for use.
   a. The Drytex finish should be mixed with water in accordance with instructions given on packaging or in data sheet DS 02.4.03.
3. General comments.
   a. All Dryvit finishes must be applied one surface at a time, i.e., to natural breaks such as building corners, dilations or masking tape. Ensure the necessary amount of workers and scaffoldings. Maintain appropriate - in accordance with work safety standards - distances between scaffolding and walls.
   b. Avoid work on hot surfaces and those exposed to strong sunlight.
4. Apply the finish using a clean stainless steel trowel to a thickness corresponding to the largest grains of aggregate.

NOTE: *Finish should not be applied inside dilation gaps.*

5. Finish texture should be made by floating with a plastic trowel on freshly applied finish. Floating should be conducted with the same hand movements and using the same tools on the entire wall surface in order to ensure a unified texture. Breaks between application of the finish and final floating may be required on cold days.
6. The finished facade should be protected against moisture and damage until it has fully dried and installation of weather-stripping and metal works has been completed. Time needed for Drytex finishes to achieve full parameters is 28 days.
7. Façade colour is achieved using by painting the finish with Demandit acrylic paint, Silstar silicone paint or Colorsil silicate paint.

NOTE: *The Drytex finish may not be left unpainted.*

B. Painting with facade paint.
1. If air and substrate temperature during the application of Drytex finish and Drycoat base layer was

+20℃ and relative humidity was 55%, the finish may be painted with façade paint after 48 hours. The required time will be longer in case of inferior weather conditions. This is extremely important during the autumn months when temperatures drop and relative humidity increases. It is recommended to wait about 7 days in case of low temperatures and high relative humidity . Applying paint to the finish too soon may cause blooming, discolouration and even – in case of moist plaster – bubbles. 2. Demandit paint should be applied at temperatures exceeding +7℃. Low temperatures and high humidity may result in paint discolouration. Silstar and Colorsil paints should be used at temperatures exceeding +5℃. Low temperatures and high humidity may result in paint discolouration.

NOTE: *Paint should not be thinned!*

3. Mix paint thoroughly prior to use.
4. Two thin coats of paint should be applied using an acrylic paint roller.
5. The facade should be protected against moisture and damage until it has fully dried and installation of weather-stripping and metal works has been completed.

IX. INSTALLATION OF WEATHER-STRIPPING

1. All dilation gaps, compensation joiners and junction points of the system with other building elements, e.g., metal works, should be weather-stripped (see data sheet DS 02.2.00).
2. The inside of dilation gaps and compensation joiners should be treated with Color Prime or an appropriate facade paint prior to the application of weather-stripping.
3. Weather-stripping should be carried out using materials described in data sheets and in accordance with manufacturer recommendations.

X. REPAIRS

A. All damaged system elements should be repaired immediately.
   1. If the cause of damage is water that has seeped under the system wall as a result of leaking weather-stripping, then:
      a. replace weather-stripping,
      b. using a sharp tool remove disjointed fragments of system cover,
      c. carry out repairs in a manner that will ensure the continuity of all Drysulation system layers.
   2. In case of mechanical damage, undertake steps as described in the installation handbook.

B. Use the same materials for carrying out repair work as were used during installation of the system.

NOTE: *Even though facade finishes may have been made using the same colour number, slight differences in colour may be visible due to the influence of atmospheric conditions. With time, these differences will disappear.*

XI. WASHING AND MAINTENANCE

A. Maintenance of Dryvit Drysulation finishes should be carried out in accordance with recommendations contained in the leaflet Maintenance and Renovation DS. 00.6.01.

XII. DRYVIT SERVICE

A. Dryvit conducts free training of future Dryvit contractors on-site.
B. Please contact us or your regional representative in order to obtain more detailed information.

**The Personal Training Certificate confirms that the employees of the given company have been instructed in the proper installation of Dryvit systems, have obtained appropriate instructions as well as conducted on-site training. Each contractor acts as an independent company and bears full responsibility for the training of its personnel. Dryvit shall not be held liable for the quality of workmanship of a trained contractor.*

The information contained in this manual conforms to standard Dryvit recommendations regarding installation of the Dryvit Outsulation system and is presented in good faith. Dryvit Systems shall not be held liable, express or implied, for the architecture as well as of engineering and workmanship. Please contact us to ensure that you have the most recent and complete information.