OUTSULATION

ACRYLIC WALL INSULATION SYSTEM FOR EXTERNAL BUILDING WALLS USING EPS BOARDS

DS 01.3.01

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 Dryvit Outsulation. The contractor, prior to starting work, should also become acquainted with the following documents:
   1. ITB Technical Approval AT-15-2808/2003
   2. Product data sheets DS. 01.4.01. to 16.
   3. Dryvit Outsulation construction details data sheet DS. 01.2.00.
   4. The external wall insulation design.

B. Work associated with the Dryvit Outsulation 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:
   1. All colours and textures described in the project. Samples should be prepared from the same materials, using the same tools, equipment and techniques that will be used on the actual facade.
   2. 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 OUTSULATION SYSTEM

A. Primer
   1. Primax (data sheet: DS 01.4.01).

B. Adhesive for adhesion of insulation boards
   1. Genesis, Primus or Dryflex polymer adhesive. The acrylic based polymer adhesive should be mixed on-site with CEM I 32.5 Portland cement (without additives) in a weight ratio of 1:1 in order to obtain an adhesive for gluing of insulation boards to substrate. Detailed information – see data sheets DS 1.4.04, DS 01.4.05, DS 01.4:06.
   2. Dryhesive PLUS adhesive – a cement based, dry mixture that is ready-to-use after mixing with water – see data sheet DS 02.4.01.

C. Thermal insulation layer
1. 1000 x 500 mm EPS boards with a thickness of between 20 and 250 mm that comply to Dryvit standards (see data sheet DS 00.6.06). In accordance with PN-EN-13163: 2004 (EPS 70040 Fasada or EPS 80 036 Fasada).

D. Base layer
   1. Genesis, Primus or Dryflex polymer adhesive mixed on-site with CEM I 32.5 Portland cement (without additives) in a weight ratio of 1:1 in order to obtain an adhesive for embedding of reinforcement mesh.
   2. Genesis DM is a high-quality mineral adhesive used to embed reinforcement mesh. As a result of using high-quality synthetic resins and modifiers, it demonstrates a high level of flexibility and durability. The adhesive is ready-to-use after mixing the powder with water.
   3. 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:
      1. Standard Plus,
      2. Panzer.

E. Dryvit facade finish
   1. 100% polymer acrylic based coloured Dryvit finishes (DS. 01.4.08):
      - Quarzputz, Sandblast, Sandpebble, Freestyle.
   2. Weatherlastic increased flexibility finishes.
   3. Special finishes:
      - Ameristone (DS 01.4.09), Stone Mist (DS 01.4.10), Ultra-Tex (DS 01.4.11).
   4. Paints, cut-off primers and surface sealants for renovation of surfaces: Demandit (DS 01.4.12), Revyvit (DS 01.4.13), Color Prime (DS 01.4.02), Seal Clear (DS 01.4.14).

F. Other materials
   1. Clean water.
   2. CEM I 32.5 Portland cement without additives.
   3. Mechanical joiners.
   4. Weather-stripping materials.
   5. PVC starter strips (stainless steel or aluminium strips designed for thermal insulation systems may also be used).
   6. PVC corner profiles (with or without mesh). Corner strips made of stainless steel or aluminium designed for thermal insulation systems may also be used).

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. All wet Dryvit products should be stored in tightly sealed original packaging for a period not exceeding 24 months from the date of manufacture found on packaging. Protect packaging against the influence of direct sunlight.

C. Dryhesive PLUS and Prius M adhesive should be stored in original bags, protected against moisture, for a period not exceeding 6 months from the date of production.

D. Minimum storage temperatures:

1. Plaster finishes, adhesive: +4°C
2. Primax: +4°C
3. Color Prime: +7°C
4. Demandit, Revyvit: +7°C
5. Seal Clear: + 10°C
6. StoneMist: + 10°C
7. Ameristone: + 10°C

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 moisture 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 Outsulation system may be used on the following mineral substrates: concrete, reinforced concrete, aerated concrete, hollow bricks.

B. Check vertical slope of wall in a few places and decide, together with architect and investor, methods of their alleviation in case of significant differences.

C. Make sure that the substrate is:

1. 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.
2. Same as in design.
3. Free of capillary and technical moisture. Mineral substrates should cure for at least 28 days.

D. Coarseness and gaps should be filled with appropriate materials.

E. Conduct a test of adherence of 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, consideration should be given to increasing substrate adhesion by using Primax primer and re-conducting the adhesion test. 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 EPS BOARDS

A. Check if EPS boards meet Dryvit requirements as defined in data sheet DS. 00.6.06. Do not use discoloured, warped or unevenly cut boards.

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 PVC 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. Primus adhesive (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 patches inside frame.

NOTE: *Adhesive should only be applied to insulation boards, never the substrate (with the exception of Dryflex).*

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 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).
- Mesh strips visible from under the surface should be embedded in fresh adhesive using a stainless trowel.

2. 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 with a 2 mm coat of Primus adhesive mixed with CEM I 32.5 Portland cement 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 Primus after embedding the dilation strip and embed mesh (see item VIII).

J. Compensation joiners
1. Compensation joiners should be made in accordance with data sheet DS. 01.2.05. in places where system materials join with other materials.
- 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).
- The side edge of the board (from the side of the joiner) as well as part of its surface should be covered with adhesive.
- Mesh strips visible from under the surface should be embedded in fresh adhesive using a stainless trowel.

K. Doors, windows and other façade openings
1. Apply strips of mesh to all openings prior to installation of EPS boards in a manner that will allow them to be rolled out onto the EPS board surface in subsequent steps.
2. Thermal insulation boards should be installed around all aperture frames in a manner preventing their edges to be continuations of aperture edges. See details contained in Dryvit Outsulation data sheet DS 01.2.00. Attachment of mesh 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. 01.2.00. The thermal insulation layer should be separated from frames and mechanical elements with the help of appropriate compensation gaps.

See construction details in data sheet DS 01.2.00.

4. 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.

L. 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.

M. The insulation layer must be even. The surface should be checked using lat of at least 2.5 m.
1. Remove all unevenness exceeding 1.5 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.*

N. 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 profiles may be used instead of this method.

O. Mechanical attachment should only be carried out in accordance with architect recommendations. The use of mechanical joiners in case of standard work and proper preparation of substrate is not required.
1. The number, placement and type of joiners to be used should be defined in the project.

VIII. 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.

IX. 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. Mounting of insulation boards
2. Fill defects.
3. Depressions formed in places where mechanical joiners have been used should be filled with Primus, Genesis or Genesis DM adhesive.
4. EPS boards that have become discoloured as a result of overexposure to sunlight should be sanded in order to completely remove the damaged surface.

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 Primus adhesive in accordance with instructions contained in data sheet DS. 01.4.06.
2. Spread a continuous layer of Primus 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 Primus. The base layer under fine finishes should be carefully evened out (reinforcement mesh may not be visible above the adhesive layer).
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 external and internal building corners. (See construction details in data sheet DS 01.2.00.
6. 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°C and 55% relative humidity).

NOTE: *Information regarding the embedding of reinforcement mesh with Genesis or Genesis DM adhesive may be found in data sheets DS. 01.4.05 and DS. 01.4.15.*

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 Primus adhesive in accordance with instructions contained in data sheet DS. 01.4.06.
2. Spread a continuous layer of Primus 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. The mesh should be completely embedded and its colour not visible on any surface.
4. Due to its thickness, Panzer mesh should not overlap but be installed edge-to-edge.
5. The 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°C and 55% relative humidity). Drying time in case of higher humidity or lower temperatures (e.g., autumn months) may be longer.
6. Next, embed Standard mesh in accordance with instructions given in item VIII B.

X. APPLICATION OF DRYVIT FINISH

A. The base layer, prior to commencing application of the Dryvit finish, should be dry, even and well bound. Drying time of the base layer is 24 hours (+20°C, 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.

B. Application of Dryvit finishes

1. General comments.
   - 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.
   - Avoid work on hot surfaces and those exposed to strong sunlight.
   - Use if possible materials having the same batch number (batch number contained on packaging).
   - Preparation for use.

   a. Dryvit acrylic finish should be thoroughly mixed with a slow-speed mixer directly prior to application in order to ensure a uniform colour.
   b. Up to 250 ml of water may be added per pail to make mixing easier. In such case, the same amount of water should be added to all pails in order to ensure no colour differences in finish.

2. Application of Dryvit finishes

   The substrate may be covered with Color Prime prior to application of finish in order to unify substrate colour.

   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. - Finish texture should be made by floating with a plastic trowel on freshly applied finish; the trowel should be cleaned often in case of Sandpebble 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.
   - Freestyle finish may be formed in any manner, however, finish thickness should not exceed 6 mm.

   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.

3. Ameristone finish
   - Color Prime in the appropriate colour should be used to correct colour prior to application of the finish.
   - Ameristone finish should be applied using a spray method and in accordance with instruction contained in data sheet DS 01.4.09.
   - The surface should be treated with Seal Clear sealant after it has dried.

4. Stonemist finish
   - Color Prime in the appropriate colour should be used to correct colour prior to application of the finish. Stonemist finish should be applied in accordance with instruction contained in data sheet DS 01.4.10.
   - The surface should be treated with Seal Clear sealant after it has dried.

XI. 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 01.2.00).
2. The inside of dilation gaps and compensation joiners should be treated with Color Prime or Demandit prior to the application of weather-stripping.
3. Weather-stripping should be carried out using materials described in data sheet DS. 00.6.02 and in accordance with manufacturer recommendations.

XII. 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:
      - replace the weather-stripping using sharp tool to remove disjointed fragments of system cover,
      - carry out repairs in a manner that will ensure the continuity of all Outsulation 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.*

XIII. WASHING AND MAINTENANCE

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

XIV. DRYVIT SERVICE

A. Dryvit conducts free training of future Dryvit contractors on-site.
B. On-site training is also available.
C. Please contact us or your regional commercial-technical 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.