

Elastocoat® C 6335/101

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Version: 01
Date of issue: 04.02.2013

Application guideline for Elastocoat C 6335/101 for waterproofing of roofs according ETAG 005-6 „Liquid applied waterproofing kits“

BASF Polyurethanes GmbH

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1. Introduction

This document outlines the general guidelines for the application and processing of the Elastocoat C 6335/101 and the required primers when used as a roof waterproofing material. This information is based upon the experience of BASF Polyurethanes GmbH, due to the general approach in this guideline, this should not be used as a "project specific" guideline. Additional and more specific guidelines can be requested from local BASF Polyurethanes Systemhouses. In this context we would like to point to the disclaimer at the end of this document.

2. Products and specifications

2.1 Suppliers

- A. BASF Polyurethanes GmbH
- B. BASF Construction Chemicals SE
- C. PPG Industries

2.2 Material description polyurea

The Elastocoat C 6335/101 (BASF Polyurethanes GmbH) is a solvent-free, highly reactive 2 component polyurea spray-elastomer to be used as a coating for various substrates; specifically it can be used as a waterproofing material for prepared roofs.

2.3 Material description primers

BASF Construction Chemicals SE:

- Mastertop P617: Solvent free 2K primer for concrete based upon epoxy resin.
- Mastertop P684: Solvented 1K primer for metallic surfaces.
- Mastertop P691: Solvented 1K urethane primer for plastic surfaces.

PPG Industries:

- P565-625: Solvented 1K primer for metallic surfaces.
- P275-124: Activator for P565-625

2.4 Material description repair material

Elastocoat C 6330/101 is a solvent-free, slow reacting, 2 component polyurea which can be manually applied for repairing small defects or damages in the existing coating.

2.5 Specifications

Detailed technical descriptions and specification of the mentioned products can be found in the relevant technical datasheets. Those will also outline the general processing and further information.

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3. Applicator's qualifications

- A. The applicator shall be experienced with both material application and surface preparation, and shall supply all labor, materials, equipment, and incidental equipment required to install Elastocoat C 6335/101 as specified in this guideline.
- B. Work shall only be executed by trained and qualified employees.
- C. BASF Polyurethanes GmbH does not offer trainings for the application of Elastocoat C 6335/101. Specific trainings are offered by equipment suppliers or the PDA – Polyurea Development Association Europe (<http://www.pda-europe.org/default.asp>)

4. Delivery, storage and handling

- A. Materials shall be delivered in their original unopened clearly marked containers.
- B. Normally the materials are delivered in blue 200 kg drums for Elastocoat C 6335/101 and red 225 kg drums for Iso 136/75.
- C. Upon delivery the type and quantity of the goods need to be cross-referenced with the delivery notice.
- D. The applicator is responsible for the correct and safe storage of the materials according the regulations. The advised handling and storage conditions can be found on the relevant Safety Datasheets.
- E. The materials should be stored between 20 and 25 °C in a clean and orderly fashion. When transported to the job site, this should be done with closed and clearly labeled drums.
- F. As shown in the technical datasheet, the shelf life of 6 months needs to be respected.
- G. The components of Elastocoat C 6335/101 can absorb or react with water. The containers need to remain closed until usage, during application a negative pressure inside the containers need to be prevented. The aeration of the drums should be done with dry air.
- H. The resin component needs to homogenized before use, hence thoroughly stirred or agitated.
- I. Empty drums should be stored until inspection by the responsible project manager. Drums should not be returned without allowance from the responsible party.
- J. For health and safety related information, please refer to the safety datasheets, technical datasheets, labeling and specific guideline in regard to health and safety.

5. Spray equipment for the application of Elastocoat C 6335/101.

- A. Elastocoat C 6335/101 is processed using 2 two-component high pressure spray machine. The mixing ratio by volume is 1:1 (resin : isocyanate).
- B. The advised equipment settings can be found in the technical datasheet. Generally the temperatures should be set at 75 °C and the pressures at 160 bar.
- C. The used spray machine should be capable of offering the required pressure, temperature and consistency of temperature at the required flow rate. This should be checked on daily basis by doing a correct setup check which involves the spraying of a sample.
- D. The pressure gauges need to monitored during the application, the observed pressures should be equal and stable (not identical and fixed). A pressure drop normally indicates a blockage at the feeding end.

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6. Application requirements for Elastocoat C 6335/101

- A. The state of the object should be inspected and documented by both applicator and contractor. To eliminate misunderstanding, the planned work and quality control measures should be documented and signed by both parties, before any work is undertaken.
- B. After inspection a thoroughly documented work-plan needs to be created.
- C. Communication with other professionals at the jobsite is highly recommended to prevent any issues in regard to planning and execution.
- D. National, local and site specific regulation and laws are to be respected.
- E. Before any application starts, the weather conditions and forecast for the required application and curing time need to be reviewed. If any type of downfall, condensation or fog is expected, the application should not be commenced.
- F. Prior and during application of the Elastocoat C 6335/101 the substrate temperature should never be lower than 3 °C above the dewpoint.
- G. At elevated wind speeds, make sure that continuation of the spray activities will not damage other nearby objects, due to overspray.
- H. Elastocoat C 6335/101 is the major part of the system buildup, the type and quality of the substrate will be the decisive factor in determining surface preparation and the type of primer required.
- I. It is advised to spray a test area to determine the adhesion, this test area should be in the more critical areas, for example near air exhausts or the most aged part of the substrate. These values can then be compared to the minimum value required from the ETAG 005-1 or ETAG 005-6 of 0,05 N/mm², and the minimum measured values by IBMB and MPA Braunschweig.
- | | |
|----------------------------|---|
| a. Requirement ETAG 005-6: | ≥ 0,05 N/mm ² |
| b. By MPA measured | lowest & average value. |
| i. Concrete: | 1,92 N/mm ² & 3,10 N/mm ² |
| ii. Bitumen: | 0,34 N/mm ² & 0,39 N/mm ² |
| iii. Galvanized steel: | 0,68 N/mm ² & 0,75 N/mm ² |
| iv. PVC sheets: | 1,87 N/mm ² & 2,02 N/mm ² |
| v. EPDM sheets : | 0,45 N/mm ² & 0,53 N/mm ² |
| vi. Extruded Polystyrene: | 0,13 N/mm ² & 0,17 N/mm ² |
| vii. Promatect H: | 0,17 N/mm ² & 0,23 N/mm ² |

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7. Application

7.1 Generic in regard to substrate preparation

- A. A complete and detailed evaluation of the substrate by the applicator is recommended. Based upon the condition of the substrate, it might be required to do additional test (such as pH-value, moisture content and others).
- B. Substrates must be free of any contaminations, such as loose particles, dirt, debris, that can have an adverse effect on adhesion. It should be prevented that these loose particles re-appear during or prior to application.
- C. The substrate must be dry, to the extend given by the technical datasheet of the primer used.
- D. The substrate preparation must be derived from the technical datasheet of the primer, it is strongly emphasized to follow those guidelines and specifications.
- E. Make sure to mask of any areas which are not to receive coating, such as walls and others.

7.2 Concrete surface preparation

- A. Aged concrete:
It is recommended to abrasive blast the substrate to remove any contaminations. Oil and fatty residues removal could require the use of waterblasting, possible aided by use of oil & fat dissolving chemicals. Cracks and uneven areas might require to be pre-filled using a suitable joint sealer or repair material. Any structural repairs should only be undertaken by trained and certified personnel.
- B. Fresh concrete:
The moisture content in fresh concrete should be below 5%, based upon experience this value is normally only achieved after minimum 28 days. The scale layer which is present on fresh concrete should also be removed.
- C. The substrate should have a uniform structure and surface profile. The substrate profile is defined within the ICRI guideline No. 03732 (International Concrete Repair Institute). For optimum performance, the Concrete Surface Profile should be between 3 and 6.
- D. The substrate should be dry and brush-clean prior to application of the primer and Elastocoat C 6335/101.
- E. Recommended primer for concrete is Mastertop P 617, application guidelines and specification can be found in the technical datasheet.

7.3 Metal surface preparation

- A. Before any application can be undertaken all contaminations that influence adhesion adversely need to be removed and a surface profile needs to be created by abrading or grit-blasting.
- B. For metallic surface such as carbon steel, stainless, aluminum and galvanized steel the following product is recommended Primecoat P 565-625, DFT 12 – 25 micron, please review the technical datasheet for full specification.
- C. For metallic surface such as, stainless, aluminum the following product is recommended Mastertop P 684, DFT 12 – 25 micron, please review the technical datasheet for full specification.

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7.4 Bitumen, EPDM or PVC sheets surface preparation

- A. The to be coated surface needs to be clean, dry, free from oil & fatty residues and loose particles.
- B. Complete adhesion between the sheets and the substrate is a pre-requisite for a long term solution with Elastocoat C 6335/101. Improperly bonded sheets can lead to delamination and blisters and therefore are not suitable to be coated with Elastocoat C 6335/101.
- C. The above mentioned substrates should be treated with Mastertop P 691, between 0,05 and 0,10 kg/m². Please review the technical datasheet for full specification.
- D. Due to the fact that bitumen, EPDM and PVC age and contaminate differently under local weather conditions, it is strongly advised to do an adhesion test. This test should be done when the system (Elastocoat C 6335/101 on Mastertop P 691 on sheets on the substrate) is fully installed. The values measured should be within the specification as outlined in section 6H, also the fracture should be between sheet and substrate.

7.5 Preparation of overlaps and joints

- A. All overlaps for existing substrates should be prepared and detailed prior to application. Specifically for joints, gaps and expansion joints.
- B. Joints should be prepared so that movement of the substrate should not result in damages to the membrane.
 - 1. Cracks with small movement (<2 mm) can be sprayed over directly.
 - 2. When movement of the substrate greater than 2 mm is expected, the membrane should be "de-coupled" over a greater width. In this case the joint area should be de-coupled using a plastic strip over the joint with a width at least 4 times the original joint size.
 - 3. Joints with greater movement such as expansion joints should be treated in greater detail and should never be sprayed over directly. These joints should be treated with joint sealers and separation layers as per local building specifications.
- C. When spraying inside corners it is advised to create an inside radius to prevent a 90° intersection.

7.6 Guidelines for the application of Elastocoat C 6335/101

- A. Please observe the product specific recommendations in the technical datasheet.
- B. The resin component needs to be thoroughly stirred or agitated prior to use.
- C. The substrate surface temperature needs to be between 5 °C and 35 °C. During the application the substrate temperature should be 3 °C above dewpoint.
- D. Overlaps of segments should be completed within one working day.
- E. If the time-lapse between different layers is more than 4 hours, the use of a coupling agent is strongly advised (such as Mastertop P 691). With even longer overcoat times it is strongly advised to clean and degrease the "old" layer prior to application of the coupling agent.
- F. The minimum DFT is 2,4 mm.
- G. In one pass, the minimum applied quantity should be 0,7 mm (approx. 0,7 kg/m²).
- H. Layer thickness can be estimated and documented based upon total consumption and total surface area. Based upon the average density of 1 kg/l and the advised thickness of 2,4 mm, an average consumption of 2,4 kg/m² is to be expected. However to due possible irregularity of a manual application, an average consumption of 3 kg/m² is advised.
- I. Any damages should be repaired prior to the installation of a sequential layer.
 - 1. Blisters should be removed, cleaned and repaired using a 1K or 2K sealer such as Elastocoat C 6330/101 (for application guideline please review section 9B)
 - 2. Pinholes or voids should be sealed with moisture curing 1K urethane mastics.

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- J. The applied layer should not be walked upon within the first 10 minutes after application. Therefor the minimum wait time between layers should be 10 minutes.
- K. Sequential layers should be applied in a “crisscross” application, 90° difference in direction of spray.
- L. Full cure is normally achieved within 48 hours.

8. Inspection and quality control

- A. The applicator is responsible for the initial acceptance of the substrate which is to be coated.
- B. Quality control of the surface preparation and coating application are the responsibility of the applicator.
- C. A daily quality control document needs to be filled in and signed on daily basis, this document should entail:
 - 1. All application steps and inspection data.
 - 2. All used products with batch numbers.
 - 3. Equipment data such as: material temperature, pressure, maintenance sequences, unscheduled application-stops and its reasons / purpose, applied quantities.
 - 4. Environmental conditions such as temperature, relative humidity, dew point, substrate temperature.
- D. Before the application is started, a free-film sample should be sprayed and evaluated. The sample should also be stored for future reference.
- E. For additional quality control on the finished product, this guideline refers to the PDA training. This should be mutually agreed upon by the applicator and contractor, according annex 6A.
- F. Any type of warranty, either on quality or suitability of the product, lies fully with the applicator.

9. Repair and maintenance of roofs coated with Elastocoat C 6335/101

- A. Repair and maintenance is described in the “Elastocoat C 6335/101 Repair Guideline” document. This document is available upon request.
- B. Small defects, such as holes which are the result of mechanical damage, can be repaired using Elastocoat C 6330/101. The pot life of 3-4 minutes allows for manual application onto the surface using techniques such as brushing or knifing. The type of surface preparation for repair is identical to the surface preparation for the spray coating application, and can be found in section 7. For a detailed description can be derived from the “application data sheet” for Elastocoat C 6330/101, which is available upon request.
- C. Larger defects can be repaired using Elastocoat C 6335/101 after the correct surface preparation has been undertaken according to section 7. Further details can be derived from the “overcoat guideline” for Elastocoat C 6335/101, which is available upon request.

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10. Safety

- A. Any possible risks or hazards in regards to handling of chemicals such as: first aid measures, personal protective equipment, storage, transport, spillages and such can be found in the safety data sheet.
- B. All personnel, involved with the application, should have read and understood the safety data sheets and labels of all the used chemicals.
- C. During the handling or application of the chemicals involved, all personnel should be safeguarded from exposure to dust, aerosols and organic vapors using either adequate ventilation or personal respiratory equipment. Please refer to the safety datasheet for an exact description of the respiratory equipment required.
- D. Proper safety glasses, gloves and protective clothing should be worn to prevent skin contact with chemicals, either liquid, vapor or aerosols.
- E. The protective equipment used shall be in accordance with local safety regulations. The applicator needs to know and understand the regulation in regard to safety, environmental control and others.

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BASF Polyurethanes Benelux B.V.
PO Box 287
5180 AG Boxtel
The Netherlands

Tel: +31 (0) 411 615 615
Fax: +31 (0) 411 615 616
Mail: pu-nl@basf.com
Internet: www.pu.basf.eu/nl