

Ballasted EPDM

Part 1 – General

1.1 Summary

This specification is specific to ballasted EPDM (Ethylene Propylene Diene Monomer) synthetic rubber single-ply roofing systems herein called EPDM. For all other applications, including mechanically-fastened and fully-adhered EPDM, please see corresponding specifications. Application is strictly limited to roofing systems in sound condition where the membrane requires rejuvenation due to normal wearing and age.

When applied monolithically, meeting minimum film thickness standards in all areas, and without misses, gaps, holidays, etc., the Ecodur Roofing System will protect the membrane from further degradation by elements such as UV, water, and normal wear.

1.2 Intended Use

This document and the information contained herein are intended to aid qualified specifiers in the creation of project-specific specifications. Castagra makes no warranty, express or implied, as to the suitability of this specification for a specific project.

1.3 Warranty

Warranties, including NDLs, may be available with pre-approval. All applications must be submitted by a Castagra Certified Applicator at least 14 days prior to project commencement.

1.4 Contractor Qualifications

Contractor shall be a Castagra Products, Inc. Certified Applicator with a minimum of 5 years of roof coating experience. Contractor shall possess a strong general knowledge of standard roofing practices and system construction. Contractor shall be in good standing with Castagra Products, Inc. with no unresolved application failures.

1.5 Manufacturer Qualifications

Manufacturer shall have a minimum of 10 years' experience in the manufacture of nature-based coating and waterproofing products.

1.6 Project Qualifications

It is the responsibility of the contractor to verify that the system to be coated is in a condition reasonably described as clean, dry, and tight. To ensure this condition, testing is required including but not limited to adhesion Testing, moisture scanning, and core sampling. Note that some types of moisture scanning do not work on EPDM and use appropriate methods. A ballasted EPDM system is one in which there is reliance on the weight of gravel or rock holding down the membrane. Such specific type of EPDM system is likely unsuitable for restoration coating unless the gravel is re-installed using a suitable slip sheet between the coated EPDM and the gravel or rock. See Castagra's technical bulletin on ballast for further information. If ballast is not being replaced, consult an engineer for an approved alternative securing system such as using mechanical fasteners with appropriate placement. Changing the ballasted EPDM system by fastening fundamentally changes the properties of the roof system. The EPDM membrane would need to be tested to verify there is

sufficient remaining strength and its other physical properties are sufficient to use in such an alternative fastening system. It is noted that EPDM tends to expand and contract through weather cycles and generally shrinks over time. The fastening system needs to have been designed with these properties accounted for. Castagra assumes no responsibility for improper fastening. It is the contractor's responsibility to enlist the aid of a qualified engineer.

1.7 Project Conditions

Substrate conditions must remain clean and dry throughout application. For application temperatures outside the range of 35° to 110°F, please consult a Castagra Products, Inc. representative. If rain occurs during application, use a moisture scanner to ensure conditions are dry prior to restarting work.

Part 2 – Products

2.1 Manufacturer

Castagra Products, Inc.
PO Box 41270
Reno, NV, 89504
888-388-2935
info@Castagra.com
www.Castagra.com

2.2 System Description

When installed correctly to a suitable substrate, the Ecodur Roof Coating system will create a very strong monolithic waterproofing system that is easy to maintain and will eliminate the need for tear-off. It is applied directly to the substrate in one or more layers, building strength and rejuvenating the existing membrane. The reflective topcoat will help reduce cooling costs, energy consumption, and HVAC wear.

2.3 Materials

- A Ecodur+: Castor oil and gypsum-based roof coating with anti-sag additives to reduce self-leveling over seams, elevation changes, and vertical surfaces, or:
- B Ecodur 201R: Castor oil and gypsum-based roof coating
- C Soladur 800 (or Soladur 700): Water-based acrylic reflective topcoat (optional, for parapets and areas not covered by ballast)
- D Slip sheets: protective mat, or filter fabric.
- E Other materials not provided by manufacturer, including but not limited to substitutions, reinforcing fabric, slip sheets, additives, etc. must be submitted to the manufacturer, in writing, no later than 14 days prior to project commencement.

2.4 Product Handling and Storage

ECODUR PRODUCTS

Do not allow products to freeze. Keep containers in a cool, dry location away from direct UV exposure. Keep containers tightly closed. Shaking may be required on containers that have settled for prolonged periods. Consult Castagra if application temperatures will be outside of 35° to 110°F.

SOLADUR PRODUCTS

Do not allow products to freeze. Keep containers in a cool, dry, well-ventilated location away from direct UV exposure. Keep containers tightly closed. Do not store above 90°F. Apply only at temperatures above 40°F and rising with less than 90% humidity and no threat of rain for 48 hours. Do not apply to surfaces over 100°F.

Part 3 – Execution

3.1 Contractor Responsibility

Proper execution of the project, including but not limited to all sections included in this specification is the responsibility of the installer. Do not proceed with installation until all unsatisfactory conditions have been remedied. Castagra assumes no responsibility for application failures.

3.2 Project Inspection

- A Measure existing membrane thickness to ensure that it is within 90% of the original thickness.
- B Bend and twist samples of the existing membrane to ensure it has not become brittle or flaky. Measure tensile strength to ensure it is within 90% of manufacturer's original rated strength.
- C A moisture survey must be performed. All wet, damaged, or otherwise unsuitable materials must be removed and replaced. If more than 10% of the total project area needs replacement, it is likely not a good candidate for liquid-applied roof rejuvenation.
- D All repairs, structural or component related, to be performed prior to proceeding when possible. If repairs are to be performed in conjunction with application, consult Castagra.
- E All obstacles, including but not limited to obsolete equipment, uncurbed HVAC, ducting, and anything else that prevents proper cleaning and coating must be removed.
- F Because of plasticizers and other similar additives used in manufacturing single-ply membranes, care must be taken to ensure that adhesion testing is performed in dissimilar environments on the roof. Examples include, but are not limited to: beneath ducting, on parapet walls, or anywhere else where UV and weather exposure may vary from the general field of the membrane.

3.3 Gravel / Rock Removal and Replacement (where applicable)

- A In the special cases, with engineer approval, where the ballast will not be re-installed, remove all gravel or rock using a truck-mounted vacuum or other means such as a power broom. If removing manually, be careful to keep pile sizes small and continuously remove via chute to a low-boy style dumpster or another suitable receptacle. Ballast is very heavy, and care must be taken to prevent overloading roof sections or receptacle tolerances. Ideally, the roof will be restored by simply moving the ballast out of the way in sections and re-installing it after the restoration coating(s) have been applied. Loading the ballast into buckets allows for easy moving while allowing the weight to continue to secure the membrane. Extra care must be taken to prevent overloading parts of the roof during these operations. A suitable slip sheet needs to be installed between the coating and ballast.
- B After all the ballast has been removed, continue agitating with a power broom to remove any residue. Surface must be clean prior to coating. If ballast is not going to be re-installed, a qualified engineer needs to determine a suitable fastening system and test the EPDM physical properties as part of such a determination. Allowances for the natural expansion and contraction of the EPDM through weather cycles needs to be taken into account as does the general long-term trend for EPDM to shrink as it ages.

- C Because of plasticizers and other similar additives used in manufacturing single-ply membranes, care must be taken to ensure that adhesion testing is performed in dissimilar environments on the roof. Examples include, but are not limited to: beneath ducting, on parapet walls, or anywhere else where UV and weather exposure may vary from the general field of the membrane.

3.4 Surface Preparation

- A Any weak, damaged, or brittle areas, including but not limited to chemical spills, mechanical damage, blisters, previous repairs, etc. must be removed and repaired prior to coating.
- B All caked-on dirt/debris, especially in low areas must be removed using a wire brush. The coating must contact the substrate directly.
- C All dirt, debris, membrane dust, and other foreign materials must be completely removed using a power broom, blower, industrial vacuum, scraper, wire brush, etc.
- D Alternate directions between multiple passes with a soft-bristled power broom.
- E All silicone must be completely removed leaving no residue. Acrylic, urethane, and most other repairs can remain only if they were properly applied, well bonded, and free from damage. Asphalt-based repair products may be chemically incompatible with the EPDM membrane. Any asphalt patches or repairs should be removed and the remaining membrane inspected for chemical damage.
- F Pressure washing is generally not recommended but may be required when grease, biological materials, or other foreign materials are present. After pressure washing, allow to dry thoroughly and confirm dryness via moisture scanning.
- G Preparation, including ballast removal can reveal existing conditions in the roof assembly. Any unsatisfactory conditions must be remedied prior to proceeding. If anything revealed is even mildly questionable, consult Castagra before proceeding.

3.5 Application

A. Repairs

1. Where wet insulation was replaced, repair membrane with suitable means per membrane manufacturer's instructions. Embed reinforcing fabric along all repair perimeters. New membrane materials must be primed with a single-ply primer per membrane manufacturer's recommendations.
2. Reinforce all seams, terminations, patches, etc. EPDM is glued together and not welded like other types of single-ply roofing membranes. As the glues age, they are more prone to movement and failure and must be reinforced. If any additional mechanical fasteners are used, be careful to ensure there is sufficient allowance for the expansion and contraction of the EPDM membrane around such fasteners to minimize or avoid having the membrane become stretched or torn. EPDM membranes generally tend to shrink as they age. This can create excessive stress at fasteners and seams which may require additional repairs and reinforcement in subsequent years. Consult a suitably qualified engineer to determine fastening patterns to allow for seasonal and general movement of the membrane system.
3. Treat tears, cracks, and other minor substrate damage by embedding reinforcing fabric a minimum of 2" on either side of the damage and extend repair to a minimum of 4" beyond the repair area in both directions.
4. Reinforce all transitions (parapets, curbs, etc.) and anywhere the EPDM system meets other roofing materials. If the EPDM membrane is in contact with asphaltic roofing materials, consult an engineer to determine if the membrane is properly protected from chemical attack.

5. Reinforce all areas showing signs of movement (pinching, twisting, etc.).
6. Repair or replace all defective penetrations, edge details, flashings, etc.
7. Repair mole runs and other areas of doming by cutting, filling with Ecodur+, and mechanically fastening. Reinforce repair seam.
8. Many repairs can be made using Ecodur 201R or Ecodur+. Please consult Castagra for specific assistance.

B. Detail

1. Using thickened Ecodur 201R or Ecodur+ coat all curbs, penetrations, vents, etc. to a minimum of 60 mils at the base and a minimum of 30 mils overall. If indicators of movement are visible, use reinforcing fabric.
2. Pitch pans can be filled with Ecodur products to seal fastened legs, odd penetrations, and many other anomalies. Consult Castagra for specific project assistance.

C. Field

1. Apply Ecodur+ or Ecodur 201R at a minimum rate 150 to 170sf per kit as needed to maintain a minimum of 40 mils at the thinnest points if existing membrane is 60 or more mils thick. Thinner membranes require more coating. 100 combined mils are required on thinner membranes (existing membrane and Ecodur products to equal at least 100 mils). Use 50-60mil notched squeegees and backroll with ¾" roller covers. Prime new roller covers by dipping the roller into a fully mixed bucket of Ecodur 201R or Ecodur+. Do not use dry roller covers. Coverage rates will vary depending on field conditions. Actual coverage rates may be less than listed. It is advisable to conduct a test area to determine actual coverage. A second coat may be required to reach the minimum 40 mil thickness. Do not use a dark color over UV exposed EPDM unless a highly reflective topcoat such as Soladur 700 or 800 is used. Dark colors absorb solar energy and can cause overheating of the membrane and materials underneath.
2. For parapets and other areas exposed to UV, spray or roll Soladur 700 or 800 (or approved substitute) in two 25 mil (approximately 1.25 to 1.5 gallons per 100sf) passes for a minimum of 24 dry mils. Apply according to current product data sheets available at <https://www.castagra.com/soladur/>
3. Curing/drying times will vary depending on temperature, humidity, sunlight exposure, application technique, and other factors.
4. Ecodur may be applied at any thickness but do not apply Soladur thicker than recommended or "mud-cracking" and slow drying may occur.
5. Total coating system thickness (Ecodur and Soladur) shall not be less than 40 dry mils at the thinnest location where no topcoat is applied and 64 dry mils where a reflective acrylic topcoat is employed.

D. Finish

1. Ballast protection mats, filter fabric, or approved substitute slip sheets must overlay all surfaces where ballast stones, pavers, or other materials will be housed on the roof.
2. Risers, sleepers, supports, or any other equipment to be housed on the rooftop shall be placed on slip sheets as listed above.
3. Replace existing ballast according to membrane manufacturer's requirements. Additional ballast stones may be required to meet current standards. Bare spots are unacceptable.

4. Create walk pads using paving stones resting on ballast protection mats, filter fabric, or approved substitute slip sheets everywhere foot traffic will be permitted. Traffic must not be allowed on rock-covered areas. Walk pads should be a minimum of 30" wide and cover all traffic, maintenance, and other areas where traffic may occur. Care must still be taken when walking on a wet roof.

The weight of the pavers must meet the membrane manufacturer's requirements for ballast weight per square foot.

E. Miscellaneous

1. Castagra does not practice roof design, consultation, or act as roof inspectors. Any assistance, advice, or observations made are for the purpose of assisting the contractor and the asset owner toward a successful project. Castagra assistance, advice, and observations do not serve as warranty for the suitability of any project. It is the contractor's responsibility to conduct proper due diligence, execute proper application, and ensure project success.
2. The use of Castagra products for any purpose other than those specifically detailed is forbidden.
3. All roofing systems must be maintained. It is the responsibility of the asset owner to follow Castagra's Owner Maintenance Guidelines available here: <https://www.castagra.com/warranty/>
4. While every attempt has been made to create a thorough and useful specification, it is impossible to foresee all potential features, obstacles, and conditions. Please consult Castagra for all project-specific questions.

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