

# HEGGEL® EL 3311

High Temperature Pre-Vulcanized Soft Rubber Lining

*You Build, We Protect!*

**Description:**

**HEGGEL EL 3311** is a black pre-vulcanized soft rubber lining, based on bromobutyl, with high temperature capability for protection of steel equipment. It used both for workshop lining and on-site lining depending on the requirements. **HEGGEL EL 3311** is engineered to offer superior resistance to steam diffusion and exceptional protection against gases such as sulfur dioxide and phosphoric acid. **The HEGGEL EL 3311** offers all the advantages of non-vulcanized rubber sheets, including seamless application on complex tank geometries and a tacky surface that ensures high adhesion strength.

**Characteristics:**

- Good resistance to a wide range of chemical, alkaline and acidic media
- Good flexibility in a wide range of temperatures
- Thickness range between 3 and 6 mm (Depending on the requirements)
- High adhesion strength
- Easy application on complex tank geometries

**Chemical Resistance:**

Information on the chemical resistance is available on request.

**Technical Data:**

| Title                            | Standard    | Value                        |
|----------------------------------|-------------|------------------------------|
| Steam Vulcanization              | -           | 4h @ 140°C by steam pressure |
| Density                          | ASTM D297   | 1.28 g/cm <sup>3</sup>       |
| Abrasion Test (With Rotation)    | DIN 53516   | ≤ 233 mm <sup>3</sup>        |
| Abrasion Test (Without Rotation) | DIN 53516   | ≤ 105 mm <sup>3</sup>        |
| Adhesion to Metal                | ASTM D429/E | 3.5 N/mm                     |
| Elongation                       | ASTM D412   | ≥ 320%                       |
| Elastic Yield                    | DIN 53512   | 13%                          |
| Tear Strength                    | ASTM D624   | ≥ 24.4 N/mm                  |
| Hardness                         | ASTM D2240  | 56 ± 5 Shore A               |
| Tensile Strength                 | ASTM D412   | ≥ 5.6 MPa                    |

**Note:** These guidelines offer technical instructions, but real-case applications require common sense, professional judgment, and flexibility to achieve the best outcomes

**Note:** The values are derived from specimens produced under reproducible laboratory conditions. However, they may vary slightly in equipment linings due to the vulcanization conditions at the factory.

**Packaging:**

The products are supplied in the following standard package sizes:

| Product                 | Size  | Package |
|-------------------------|-------|---------|
| HEGGEL Bond 2210 Primer | 20 kg | Can     |
| HEGGEL Bond 2235        | 20 kg | Can     |
| Cleaning Solution       | 20 kg | Can     |

**Storage:**

The products must be stored in a dark and dry place at a temperature of max. 25°C in accordance with DIN 7716. The materials should not be exposed to freezing conditions, heat, flame, or spark. Check expiration dates and dispose of outdated and contaminated products. At the specified storage temperatures, a shelf life of the products is given of at least for the following periods:

| Product                 | Temperature | Shelf Life |
|-------------------------|-------------|------------|
| HEGGEL Bond 2210 Primer | 20°C        | 24 Months  |
| HEGGEL Bond 2235        | 20°C        | 12 Months  |
| Cleaning Solution       | 20°C        | 24 Months  |
| HEGGEL EL 3311 sheet    | 20°C        | 36 Months  |

Depending on storage conditions it may be possible to use rubber linings beyond the recommended shelf life however additional testing must be completed. Please contact HEGGEL for recommended test procedures. A sample of the rubber lining can also be sent back to HEGGEL for verification.

## 1. Surface Preparation

The substrate which is to be protected must meet the requirements contained in DIN EN14879-1 as well as DIN 28051-97, DIN 28053-97, NACE RP0178-95. Bonding to both steel and concrete is possible. Bonding to other metallic substrates (such as titanium, copper, etc.) can be achieved provided that it is consulted with our technical department.

The metallic substrate must be blasted to achieve a minimum blast cleaning grade of SA 2½ with "medium" profile according to DIN EN ISO 12944-4, ISO 8501-1, ISO 8503- 1,2 and SSPC SSPC-SP-5 (recommended minimum surface roughness Rz = 50 µm).

It is advisable to apply the primer to the blasted surface as soon as possible, and definitely before any traces of rust can reform.

## 2. Environmental Conditions

The substrate must be dry and warmed if necessary, during application. Uncured material should be protected from moisture (condensation, fog, precipitation or other water source). Temperature of the substrate must be 3° C above the dew point temperature and should not be allowed to drop below that point throughout the lining process. (5°C dew point distance is highly recommended for ambient temperature lower than 10°C.)

## 3. Consumption

| Component                      | Consumption per Coat                              | Number of Coats |
|--------------------------------|---|-----------------|
| <b>HEGSEL Bond 2210 Primer</b> | 150 g/m <sup>2</sup>                              | 1 coat          |
| <b>HEGSEL Bond 2235</b>        | 200 g/m <sup>2</sup>                              | 4 coats         |
| <b>Activator</b>               | 3% W/W of the quantity of <b>HEGSEL Bond 2235</b> | -               |
| <b>Cleaning Solution</b>       | 150 g/m <sup>2</sup>                              | 1 coat          |

**Note:** The above value may change in the different work conditions.

## 4. Application

The adhesion cycle includes **HEGSEL Bond 2210 Primer**, the two-component **HEGSEL Bond 2235**, and a cleaning solution.

First, apply one coat of **HEGSEL Bond 2210 Primer** to the blasted substrate. Then, grind and wash the **HEGSEL EL 3311** layer before application. Apply two coats on the substrate and two coats on the washed rubber sheet layer. The rubber sheet should be pressed in accordance with DIN EN 14879-4 and DIN 28055/1-02. Finally, perform spark testing as per DIN 28055/2-02 and NACE RP 0188-90 at 3 kV/mm.

## 5. Vulcanization

No vulcanization or heat treatment is needed.

## 6. Safety Measures

During the implementation of all work, ventilation must be ensured. Ventilation is mandatory for all work performed in pits and confined spaces. All the vapors generated during processing must be continuously exhausted at ground level or below. Only as much material as is necessary for the continuation of the work is to be stored at the work site. It must be observed and ensured that even the lowest quantities of each single component or the mixtures prepared shall not enter the sewage system. All local laws, regulations and international standards for accident prevention of the employer's liability insurance association need to be strictly adhered to.

The material safety data sheets of the individual components, the safety instructions on the packing (label) as well as the legal requirements for handling hazardous materials must be observed.

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All information contained herein is based on the current state of our knowledge and practical experience at the time of release. Therefore, please make sure that this is the latest edition of the Technical Data Sheet. All data are only intended as a guideline for informational purposes and do not constitute a legally-binding warranty of the suitability for a certain purpose of use, due to its dependence on site conditions and possible processing, use and applications. All information contained in this technical datasheet is subject to change without notice.

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