The following information concerns all our valued customers who buy or intend to buy CurTec-drums. As part of our change control protocol, I would like to inform you about a planned change of gaskets used in the drum closure.

In order to secure a reliable source of supply, we are in the process of appointing new suppliers for gaskets. These suppliers are using a different base material for the gaskets; EPDM (Ethylene Propylene Diene Monomer). EPDM is the synthetic alternative for the current NR/SBR (natural rubber) version.

Before choosing this material as an alternative to the NR/SBR gaskets, we made sure it fulfilled all our technical and quality requirements. Our R&D department extensively tested its sealing capacity, migration performance and moisture vapor transmission according to international standards.

In future deliveries all CurTec drums will be fit with either the NR/SBR or EDPM gasket. Similar to the different brands of plastic material used in the drums, the type of gasket that is fit in a specific drum can be traced via identification marks on individual products.

For your reference, I have made a detailed summary of all relevant data on quality testing, available certificates and other background information on the EPDM gaskets.

Please review the documents carefully. Should you require additional information to process this change in your quality system, please respond to me by e-mail before November 1st 2014. If you do not respond before this date, CurTec assumes that you will formally accept this change.

As of December 1st 2014 all drums will be fit with a gasket from either NR/SBR or EDPM. Both materials fully comply with CurTec quality specifications, based on industry standards.

For further assistance, please e-mail me: change.control@curtec.com

Kind regards,

Eef van Holland
Regulatory Affairs & Compliance Officer
What is EPDM?

Ethylene Propylene Diene Monomer (EPDM) is the precise term for a type of synthetic rubber.

It has become very popular for general and specific applications as EPDM has a variety of physical properties which makes it suitable for automobile, weather protection and closure applications. It is in demand for these applications because it is easy to manufacture to different specifications.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>NR/SBR</th>
<th>EPDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Resistance</td>
<td>-30 to 70</td>
<td>-35 to 120</td>
</tr>
<tr>
<td></td>
<td>-22 to 158</td>
<td>-31 to 248</td>
</tr>
<tr>
<td>Hardness</td>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td>Density</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>Compression set</td>
<td>&lt; 40%</td>
<td>&lt; 40%</td>
</tr>
<tr>
<td>Color</td>
<td>2015</td>
<td>2015</td>
</tr>
</tbody>
</table>

* Comparable with 15 Shore A  
** DIN 53479 A  
*** At 70°C, 24 hours, measured after 30 minutes

EPDM in closure systems

Since the development of EPDM in the seventies, the material found its way in many applications. Based on its mechanical behavior EPDM is applied in many closure systems. Early applications include seals for vehicle lights but more recently EPDM is also used in packaging products. Today, besides CurTec, other packaging suppliers offer EPDM gaskets in many of their products.
VPA2 quality guidelines

The German organization for the chemical industry VCI (www.vci.de) developed guidelines for all types of packaging. The VPA2 guideline specifically deals with rubber gaskets. Given the very extensive description of tests and characteristics, CurTec follows the VPA2 guideline.

VPA guidelines were made in close cooperation with the packaging manufacturing industry, their associations and the VCI. In VPA basic technical details, testing conditions, contents of certificates and so forth are described. Norms are based on ISO and DIN, where possible VPA refer to superior regulations, e.g. valid standards. Legal regulations, for example with labeling of packaging, always have priority.

For packaging manufacturers and users the advantage of applying VPA lies in making standardized demands for packaging. The same testing methods and evaluation criteria are being applied for quality control.
Sealings made of foam rubber or freely foamed

Sources

- DIN 7715-1 of Feb. 1977 - rubber parts, tolerable off-size, articles made of hard rubber
- DIN EN ISO 1307 of Jan. 1996 - rubber and plastic tubes for industrial use - inner diameter and length tolerance
- DIN 7715-5 of Nov. 1979 - rubber parts, tolerable off-size, plates and plate articles made of soft rubber (elastomer)
- DIN EN ISO 1923 of June 1995 - foam rubber - determination of linear measures
- DIN ISO 815 of March 2000 – Elastomer; Determination of compression set
- DIN EN ISO 845 of June 1995 - foam rubber made of rubber and plastics - determination of gross density
- DIN 53579-1 of March 1987- test of soft elastic foam rubber; hardness test on finished parts; impression test on formed parts
- DIN ISO 11752 of Nov. 2004 – Flexible cellular polymeric materials – Moulded and extruded sponge or expanded cellular rubber products – Compressibility test on finished parts
- DIN 53 505 of June 1987 - test of rubber, elastomers and plastics, hardness test according to Shore A and Shore D

1. Sampling

Samples are taken out of individual lots according to statistic quality control regularities in order to test sealings in following individual tests.

2. Shade of colour and surface quality (visual test)

2.1 Shade of colour
Prescribed shade of colour to be checked by comparison with colour charts or samples.

2.2 Surface quality
Sealing must have a closed outer skin without small cavities or cracks.
3. Dimensions

3.1 Diameter (foam rubber)
Based upon DIN EN ISO 1923 the diameter of a sealing string is measured at 5 spots (joint excluded) with measuring accuracy of 0.1 mm.

3.2 Height (free foamed seal)
Sealing height of a free foamed seal is measured either based on DIN EN ISO 1923 at 5 spots of the sealing removed from groove or as difference measure between upper and lower lid level. A tolerance of ± 5 % for metal and ± 10 % for plastic containers is admissible.

3.3 Width, height
For every nominal size the admissible tolerance is according to the following table:

<table>
<thead>
<tr>
<th>Nominal size in mm</th>
<th>Admissible Tolerance in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 6.0</td>
<td>+/- 0.4</td>
</tr>
<tr>
<td>up to 10.0</td>
<td>+/- 0.5</td>
</tr>
<tr>
<td>up to 18.0</td>
<td>+/- 0.6</td>
</tr>
</tbody>
</table>

3.4 Flat length
Sealing is cut opposite joint and measured free of tension with an accuracy of 1 mm. Admissible tolerances are defined in the following table:

<table>
<thead>
<tr>
<th>Flat length in mm</th>
<th>Admissible Tolerance in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 1000</td>
<td>+/- 5</td>
</tr>
<tr>
<td>up to 1500</td>
<td>+/- 8</td>
</tr>
<tr>
<td>up to 2000</td>
<td>+/- 10</td>
</tr>
<tr>
<td>up to 2500</td>
<td>+/- 15</td>
</tr>
</tbody>
</table>

4. Mass per meter
Cut and measured according to number 3.4 the sealing is weighed. Mass in g is converted into g/m and rounded up to 1 g/m. For the different nominal string diameters the following figures are prescribed:
5. Joint spot

5.1 Finish
Joint spot finish is evaluated by visual inspection. Sealing string ends should be cut vertically to longitudinal axis and glued together with a maximum misalignment of 0.5 mm. Every sealing must have only one joint.

5.2 Durability (foam rubber)
For the test a 100 mm section is cut out of open sealing so that the joint spot is in the middle of the section’s length. The section then is axially loaded with a mass, which is assigned to the diameter, thus subjected to tensile stress for 10 minutes at room temperature. Joint spot thereby must not be slightly or fully torn. Testing masses according to following table:

<table>
<thead>
<tr>
<th>Nominal diameter in mm</th>
<th>Testing mass in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 6.0</td>
<td>1.0</td>
</tr>
<tr>
<td>up to 7.0</td>
<td>1.5</td>
</tr>
<tr>
<td>up to 8.0</td>
<td>2.0</td>
</tr>
<tr>
<td>up to 9.0</td>
<td>2.5</td>
</tr>
<tr>
<td>up to 10.0</td>
<td>3.0</td>
</tr>
<tr>
<td>up to 11.0</td>
<td>3.5</td>
</tr>
<tr>
<td>up to 12.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

An example for a durability test set up is given in picture 1.
6. Compressibility

Sealings are strained radially between two smooth and even pressure plates at room temperature on three spots according or on a section 100 mm long (joint spot excluded). After the straining period the height of the compressed sealings is measured and the compressibility \( z \) in \%, rounded to 0.1 \%, is calculated according to following formula:

\[
z = \left( \frac{h_0 - h_1}{h_0} \right) \times 100
\]

\( h_0 \) = actual diameter or height of string without strain in mm, rounded to 0.1 mm (according to number 3.1 or 3.2).

\( h_1 \) = height of sealing after straining period in mm, rounded up to 0.1 mm.

Test result is the average of the three individual measurements, rounded up to 1 \%.

6.1 Foam rubber

For the different nominal string-diameters the following figures are prescribed:

<table>
<thead>
<tr>
<th>Nominal string diameter in mm</th>
<th>Compressibility in % for hard sealing</th>
<th>Compressibility in % for soft sealing</th>
<th>Admissible tolerance in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>46</td>
<td>59</td>
<td>for all</td>
</tr>
<tr>
<td>6.0</td>
<td>45</td>
<td>57</td>
<td>dia-</td>
</tr>
<tr>
<td>7.0</td>
<td>40</td>
<td>55</td>
<td>meters</td>
</tr>
<tr>
<td>8.0</td>
<td>35</td>
<td>54</td>
<td>± 5</td>
</tr>
<tr>
<td>8.5</td>
<td>33</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>32</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>30</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>25</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

6.2 Freely foamed sealings

For freely foamed sealings is:

\[
z = 20 - 45 \%
\]
7. **Compression strain rest**

Three sealing sections of 120 mm length (without joint spot) are strained radially between two smooth and even pressure plates according to picture 3 (DIN 53 517 page 1) at 70° C for 24 hours (foam rubber) or at 23° C (freely foamed). Then the strain is removed from the sections and without further strain they are stored at room temperature for 30 minutes (foam rubber) or 10 min (freely foamed). After storage period the sealing height is measured in direction of previous strain and the compression strain rest (DVR) in %, rounded up to 0.1 % is calculated according to following formula:

\[
DVR = \frac{(h_0 - h_2)}{(h_0 - h_1)} \times 100
\]

- \(h_0\) = actual string diameter or height without strain in mm, rounded up to 0.1 mm (according to number 3.1 or 3.2).
- \(h_1\) = sealing height after radial compression to 50 % of string diameter in mm, rounded up to 0.1 mm.
- \(h_2\) = sealing height after strain and storage of 30 or 10 minutes, measured in strain direction in mm, rounded up to 0.1 mm.

Test result is the average of the three individual mesurements, rounded up to 1 %. For all sealings is required:

\(DVR < 40\%\)

8. **Resistance to contents**

Sealings resistance to contents is to be checked by filler.
A moisture vapor transmission rate (MVTR) is a measure of the passage of water vapor through a material at a specified temperature and relative humidity.

Since there is no standard guideline for MVTR in bulk packaging, CurTec applies an internal norm based on USP <671>. This recently revised USP chapter only covers performance testing for multiple-unit containers with an opening up to 132 mm. CurTec bulk packaging has diameters up to 400 mm.

**MVTR in CurTec packaging is < 30 mg / day / liter capacity**

Tests are performed according to ASTM standard D 4279-95 Method B.

According to USP <671> containers are ranked as ‘tight containers’ if results are < 100 mg / day / liter, which is the best performing defined level.

Detailed information per product line is available on request.
Designation: D 4279 – 95 (Reapproved 2003)

Standard Test Methods for Water Vapor Transmission of Shipping Containers—Constant and Cycle Methods

This standard is issued under the fixed designation D 4279; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods cover the determination of water vapor transmission rates for bulk shipping containers, as follows:
   1.1.1 Method A, for Reclosable Containers, and
   1.1.2 Method B, for Containers Not Designed for Reclosing.

1.2 Within each procedure details are given for the constant and cycle methods of test atmosphere.

1.3 The test may be applied to the container as packed, or after one or more performance tests such as drum (Method D 782), vibration (Methods D 999), drop (Test Method D 5276), impact resistance (Test Methods D 880, D 4003, and D 5277), or performance tests (Practice D 4169), as required.

1.4 For small shipping containers requiring greater accuracy in weighing, the water vapor transmission may be determined in accordance with Test Method D 895 or Test Method D 1251.

1.5 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:
   D 782 Method of Testing Shipping Containers in Revolving Hexagonal Drum
   D 880 Method of Incline Impact Test for Shipping Containers
   D 895 Test Method for Water Vapor Permeability of Packages
   D 996 Terminology of Packaging and Distribution Environments
   D 999 Methods for Vibration Testing of Shipping Containers
   D 1251 Test Method for Water Vapor Permeability of Packages by Cycle Method
   D 4003 Methods of Controlled Horizontal Impact Test for Shipping Containers
   D 4169 Practice for Performance Testing of Shipping Containers and Systems
   D 5276 Test Method for Drop Test of Loaded Containers by Free Fall
   D 5277 Test Method for Performing Programmed Horizontal Impacts Using an Inclined Impact Tester

3. Terminology

3.1 Definitions—General definitions for the packaging and distribution environments are found in Terminology D 996.

3.2 Definitions of Terms Specific to This Standard: Descriptions of Terms Specific to This Standard:

3.2.1 water vapor transmission rate of a shipping container (constant atmosphere method)—for the purpose of this test method, the rate at which water is transmitted into the container from the test atmosphere (normally of 90 ± 2 % relative humidity and a temperature of 100° ± 2°F (37.8° ± 1.1°C) surrounding it while a desiccant is sealed within.

3.2.2 water vapor transmission into a container (cycle atmosphere method)—for this test method, the amount of water transmitted into the container from the test atmosphere during one cycle while a desiccant is sealed within.

3.2.3 cycle—one series of test atmospheres to which the test specimens are exposed. Normally one cycle will consist of 1 week of exposure to a temperature of 0° ± 5°F (−17.8° ± 2.8°C) to be followed by 3 weeks of exposure at a temperature of 100° ± 2°F (37.8° ± 1.1°C) and a relative humidity of 90 ± 2 %.

4. Significance and Use

4.1 These test methods are normally used for the following purposes:
   4.1.1 To evaluate materials and constructions for a specific type of container,
   4.1.2 To compare performance of different types of containers,
   4.1.3 To determine adequacy of protection for a specific product or application, and
4.1.4 To maintain quality control.

**METHOD A—RECLOSABLE CONTAINERS**

5. Apparatus

5.1 Desiccant—A desiccant shall be used that has a powerful affinity for water and a high drying efficiency, that is, a low vapor pressure after absorbing a large amount of water. The desiccant shall be in the form of small lumps that will pass a No. 8 (2.36-mm) sieve and be free from fines that will pass a No. 30 (600-µm) sieve. Anhydrous calcium chloride and anhydrous magnesium perchlorate have been found suitable. When the test is made to determine the suitability of a specific container for a particular product, that product may be used inside the test specimen instead of the desiccant, in which case the specimen shall be filled to normal capacity.

5.2 Weighing Balance—A weighing balance accurate to within 1 g shall be used. When the required amount of desiccant is greater than can be weighed on a balance of this sensitivity, two or more receptacles shall be used and weighed individually. When product tests are made, a regular laboratory balance and drying oven or other appropriate equipment are required for making standard moisture determinations peculiar to the product.

5.3 Receptacle for Desiccant—A nonmoisture-absorptive receptacle ¼ to 1½ in. (19 to 38 mm) deep shall be used for holding the desiccant within the container being tested. It should be equipped with a cover that will rest on the top rim of the receptacle to protect the desiccant from picking up moisture while being weighed. The size of the weighing receptacle or receptacles shall be such that the exposed area of desiccant is not less than 10 % of the area of the test specimen. For testing large containers, this may require using two or more weighing receptacles.

5.4 Test Chamber—A test room or cabinet provided with conditioned air that is continuously circulated around the specimens under test. The conditions in the chamber shall be such that no condensation occurs on the specimens except during that portion of the cycle when the exposure is changed from a low temperature to a high temperature.

6. Test Specimens

6.1 Test specimens shall be representative of the containers being tested, and shall be closed and sealed in the normal manner.

6.2 The performance shall be based on tests of not less than two representative specimens of a given size and type of container.

7. Procedure

7.1 Locate the weighing receptacle or receptacles centrally within the test specimen, using a nonabsorptive support when required. Place the selected quantity of the desiccant in the receptacle sufficient to uniformly cover the area of the receptacle to a depth of not less than ½ in. (13 mm). Cover, and after weighing, immediately transfer into the test specimen. Uncover the receptacle and close and seal the specimen in the normal manner. The desiccant may require one or more replacements if it becomes noticeably moist during the test.

**Note 1—**When the test is conducted to determine the water vapor transmission of the shipping container for research, development, manufacturing control, specification acceptance, etc., a desiccant shall be used as the water absorbing medium. When the test is used to determine the suitability of the shipping container with respect to water vapor resistance for a particular product, the product shall be used in lieu of the desiccant.

7.2 Place the specimen inside the test room or cabinet in a position where free access of the conditioned circulating air is provided on all surfaces of the container according to the following:

7.2.1 Constant Atmosphere Method—Normally surrounding conditions are 90 ± 2 % relative humidity and a temperature of 100°F ± 2°F (37.7°C ± 1.1°C).

7.2.2 Cycle Atmosphere Method—Place the specimen in the low temperature test room or cabinet (normally maintained at 0°F (−17.8°C) for a period of 1 week. Follow immediately by 3 weeks of exposure to the high temperature and humidity (normally 100°F (37.8°C) and 90 % relative humidity).

7.3 Make successive weighings of the receptacle at suitable intervals and plot the mass gained against time using these schedules:

7.3.1 Constant Method—Accuracy of the test is adversely affected by too frequent weighings. For highly permeable containers a minimum weighing frequency of 3 days is recommended. For containers having a low rate of transmission, a weighing frequency of biweekly to monthly is recommended.

7.3.2 Cycle Method—Make successive weighings of the receptacle at the completion of each cycle. It is suggested that the test be carried on for a minimum of three complete cycles.

7.4 The weighing procedure, which should be conducted as rapidly as possible, shall be as follows: Remove the specimen from the test chamber, open, remove the receptacle, and place the cover on the receptacle. Temporarily close the specimen to prevent the entrance of moisture from the surrounding atmosphere. Weigh the receptacle, open the specimen, and return the receptacle. Uncover the receptacle, reclose the specimen, and return it without delay to the test room or cabinet. Continue until a constant rate of gain is attained as indicated by at least three successive points in a straight line. The slope of this portion of the curve will furnish a measure of water vapor transmission.

**Note 2—**In instances where tests are made in which specific products are used in place of the standard desiccant, a constant rate of gain may not be attainable. Therefore, for product tests, the container is filled to its normal capacity and the moisture content determined from a composite sample taken at the start of the test.

For the Constant Method the specimen is placed in the test room for a predetermined period (usually one month), removed, and the average moisture content determined from a composite sample taken at the end of this period.

For the Cycle Method the specimen shall be subjected to one exposure cycle for a predetermined period, removed, and the average moisture content determined from a composite sample taken at the end of this period.

In either method the test can be continued by immediately closing and resealing, after which the specimen is returned without delay to the test room or cabinet.
8. Apparatus

8.1 The apparatus shall consist of a desiccant, balance, and test chamber in accordance with 5.1, 5.2, 5.4 respectively, also desiccant receptacles in accordance with 5.3 if it is not practicable to weigh the entire container with the desiccant inside.

9. Test Specimens

9.1 Test specimens shall be representative of the containers being tested, and shall be closed and sealed in the normal manner. For containers that cannot be weighed to the accuracy prescribed in 5.2 with desiccant inside, an auxiliary opening large enough to permit inserting the desiccant receptacle shall be cut in one face. A means of sealing the opening during the test shall be provided that will permit repeated opening and reclosing during the test. Closure of this handhole can be accomplished with a piece of sheet metal, or other impervious sheeting somewhat larger than the opening, sealing it in place with wax (Note 3), or forming an equally impervious seal by other means.

Note 3—A satisfactory wax for this purpose consists of a mixture of 60% microcrystalline wax and 40% refined crystalline paraffin wax.

10. Procedure

10.1 For specimens that can be weighed accurately to the requirements prescribed in 5.2, place the selected quantity of desiccant or product inside the specimen, which shall then be closed and sealed in the normal manner. Place the specimen in the test atmosphere as described in 7.2 and make successive weighings at suitable intervals until a constant rate of gain is established as described in 7.3.

10.2 For specimens that are not practicable to weigh as described in 10.1 proceed exactly as in Section 7 except use the auxiliary opening described in Section 9 as the access opening. The regular closure is to remain sealed throughout the test.

REPORT AND PRECISION

11. Report

11.1 The report shall include the following:

11.1.1 Identification of container including data on closure, liners, etc., and whether Method A or B was used,

11.1.2 Desiccant used or identification of contents if a product is used. When a desiccant is used, the mass and area exposed shall be specified, and

11.1.3 Number or specimens tested.

11.2 If the Constant Method is used, record the following:

11.2.1 Temperature and relative humidity at which the test was conducted. If the tolerance of 2% relative humidity or 2°F (±1.1°C) temperature is exceeded, the variation shall be specified, and

11.2.2 Water vapor transmission reported as grams of water per 30 days for the container as a unit.

11.3 If the Cycle Method is used record the following:

11.3.1 Temperature, relative humidity, and time for each test atmosphere of the cycle at which the test was conducted, and

11.3.2 Water vapor transmission reported as grams of water per cycle for the package as a unit.

11.4 The water vapor transmission rate calculation shall be made for the period of constant rate of gain. If a product is used instead of a desiccant, the moisture content at the start and completion of each cycle shall be given, together with the net weight of contents, from which data the actual amount of water pick up can be calculated.3

12. Precision and Bias

12.1 Precision—Based on limited information from one laboratory, the repeatability coefficient of variation for the constant atmosphere method is approximately 6 percent.

12.2 Bias—The procedure in this test method has no bias because the value is defined only in terms of this test method.

13. Keywords

13.1 constant rate of gain; cycle method; desiccant; reclosable containers; water vapor permeability

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3 Grade Numbers 2300, 2305, and 2310 of the Mobil Oil Corp., or their equivalent, have been found satisfactory for this purpose.
Food contact: Migration

CurTec gaskets comply with international legislation for food contact applications

The most specific legislation for rubber gaskets is CFR 21 FDA 177.2600, ‘rubber articles intended for repeated use’. In Europe people often refer to EC 1935/2004, a general guideline which sets up requirements for all food contact materials.

On top of that CurTec follows:

- Guidelines provided by the BfR, the German federal institute for risk assessment. This system is widely followed and well respected throughout Europe.
- ResAP 2004/4, a resolution from the Council of Europe on rubber products intended to come into contact with foodstuffs. CurTec gaskets are classified as Category III.
- The Dutch Warenwet (Food and Drug Act). European guidelines and legislation for food contact applications are translated into Dutch law, the so called ‘Warenwet’. This law is known to be stricter than European law

You can [download](#) our Regulatory Affairs datasheet for more information.
The ends must be glued with cyanoacrylate. Maximum difference between ends: 0.5mm.

<table>
<thead>
<tr>
<th>Article Number EPDM</th>
<th>Article Number NR/SBR</th>
<th>Diameter (ØD)</th>
<th>Chord Diameter (Ød)</th>
<th>Stretched Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H14-310</td>
<td>H14-110</td>
<td>141,0</td>
<td>5.2 ±0,4</td>
<td>434,0 ±3,0</td>
</tr>
<tr>
<td>H14-306</td>
<td>H14-106</td>
<td>205,5</td>
<td>6.4 ±0,4</td>
<td>645,5 ±3,5</td>
</tr>
<tr>
<td>H14-307</td>
<td>H14-107</td>
<td>289,5</td>
<td>8.0 ±0,4</td>
<td>900,0 ±5,0</td>
</tr>
<tr>
<td>H14-314</td>
<td>H14-114</td>
<td>296,0</td>
<td>5.2 ±0,4</td>
<td>930,0 ±7,0</td>
</tr>
<tr>
<td>H14-325</td>
<td>H14-125</td>
<td>300,0</td>
<td>7.7 ±0,4</td>
<td>942,0 ±5,0</td>
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<tr>
<td>H14-320</td>
<td>H14-120</td>
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<td>8.0 ±0,4</td>
<td>1032,0 ±5,0</td>
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<tr>
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<td>H14-109</td>
<td>356,5</td>
<td>9.1 ±0,5</td>
<td>1120,0 ±6,0</td>
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<tr>
<td>H14-311</td>
<td>H14-111</td>
<td>394,5</td>
<td>9.3 ±0,5</td>
<td>1239,5 ±6,5</td>
</tr>
</tbody>
</table>
Product specification

Sponge Rubber Gaskets based on **EPDM** - Compound 2261 light:
*Document issued 2 August 2013*

Sponge Rubber Gaskets based on **NR/SBR** - Compound 2061 light
*Document issued 2 January 2013*

Manufactured by:
**Leeser GmbH & Co. KG**
Ottostrasse 25-27
41836 Hückelhoven-Baal
Germany
Sponge Rubber Gaskets based on EPDM
Compound 2261 light

**Composition**

Base polymer : - special blend of **EPDM**

Fillers : - mixture of natural minerals such as kaolin, talc, whiting

Plasticizers : - refined paraffinic / naphthenic oils

Curing system: : - conventional cross-linking with sulphur and sulphur donor

**Properties**

Specific gravity (DIN 53479 A) : - depending on compound composition and manufacturing process approx. 0,5 - 0,6 g/cm³

Compression deflection under constant load (VPA 2) : - depends on the diameter of the profile and can vary from 30% to 70 % for diameters from 6 to 14 mm

Hardness (ASTM D 2240) : - 65 Shore 00 (comparable to 20 Shore A)

Compression set (VPA 2) : - ≤ 40 %

Mechanical characteristics : - medium tensile strength, medium elongation at break, medium elasticity

Heat resistance : - under static load and depending on „fine tuning“ of the compound limited from -35°C up to +120°C - temperature range can be exceeded for short times

Ageing resistance : - due to the completely saturated methylene-chain of EPDM excellent protected against influence of light, air, ozone and weathering, but not comparing to the stability of solid EPDM rubbers

Storage stability (see also DIN 7716) : - due to the cellular, thin-walled structure of expanded rubber the material is less resistant than solid rubber (same as ageing resistance)
Sponge Rubber Gaskets based on EPDM
Compound 2261 light

- under normal conditions, i.e. at room temperature (at about 20°C), excluding light and humidity, about 3 years

Resistance to chemicals:
- in general good resistance to water, aqueous salt solutions, alcohols, glycols, ketones
- limited resistance to strong oxidizing liquids for example nitric acid and organic media with at the same time polar and lipophile characteristics like longchain alcohols and ketones
- not resistant to mineral oils and grease

BFR/FDA status

The EPDM based rubber compound 2261 meets the requirements of 4th category of the XX1st recommendation of the BFR (Bundesinstitut für Risikobewertung, former BGVV / Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin, former BGA / Bundesgesundheitsamt).

The category 4 regulates the requirements for rubber articles intended for use in contact with food for a short time or a small contact area. Samples for such applications are conveyor belts, cover rolls, pressure- and suction hoses, valve-/container- or conduit-gaskets.

The EPDM based rubber compound 2261 is conform to §177.2600 CRF/FDA.

The formulation 2261 does not contain any nitrosamine builder and meets therefore the state of the art and legal regulations in many countries.

Food contact

Leeser GmbH & Co. KG have developed the EPDM compound in quality 2261 grade without the use of blowing agent Azodicarbonamide. These SEM free compound is specifically designed for use in food contact applications and is suitable for all general purposes.

The information contained herein is based upon data believed to be reliable and relates only to the matters specifically contained herein. Although such information is to the best of our knowledge and belief, accurate and reliable as of the date hereof, no representation, warranty (express or implied, of merchantability, fitness or otherwise) or guarantee is made as to the suitability, accuracy, reliability or completeness of the information. It is the user’s responsibility to satisfy itself as to the the suitability, accuracy, reliability or completeness of such information for its particular use. Leeser shall not be liable for any loss, damage or injury that may occur from the use of this information.
Sponge Rubber Gaskets based on NR/SBR
Compound 2061 light

**Composition**

**Base polymer**
- special blend of NR/IR and SBR

**Fillers**
- mixture of natural minerals such as kaolin, talc, whiting

**Plasticizers**
- refined paraffinic / naphthenic oils

**Curing system**
- conventional cross-linking with sulphur and sulphur donor

**Properties**

**Specific gravity (DIN 53479 A)**
- depending on compound composition and manufacturing process approx. 0.5 - 0.6 g/cm³

**Compression deflection under constant load (VPA 2)**
- depends on the diameter of the profile and can vary from 30% to 70% for diameters from 6 to 14 mm

**Hardness (ASTM D 2240)**
- 70 Shore 00 (comparable to 15 Shore A)

**Compression set (VPA 2)**
- ≤ 40 %

**Mechanical characteristics**
- higher elasticity and good resilience, high tensile strength and high elongation at break

**Heat resistance**
- under static load and depending on „fine tuning“ of the compound limited from -30°C up to +70°C - temperature range can be exceeded for short times

**Ageing resistance**
- due to the unsaturated polymers only medium resistance against ageing, not comparing to the stability of solid NR/SBR rubbers

**Storage stability (see also DIN 7716)**
- due to the cellular, thin-walled structure of expanded rubber the material is less resistant than solid rubber (same as ageing resistance) - under normal conditions, i.e. at room temperature (at about 20°C), excluding light and humidity, about 2 to 3 years
**Sponge Rubber Gaskets based on NR/SBR**  
**Compound 2061 light**

Resistance to chemicals:  
- in general good resistance to water, aqueous salt solutions, alcohols, glycols, ketones  
- limited resistance to diluted acids and alkaline solutions  
- not resistant to organic solvents, halogenated solvents, aromatic compounds, mineral oils and strong oxidizing media

**BFR/FDA status**

The **NR/SBR based rubber compound 2061** meets the requirements of 4th category of the XXIst recommendation of the BFR (Bundesinstitut für Risikobewertung, former BGVV / Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin, former BGA / Bundesgesundheitsamt).

The category 4 regulates the requirements for rubber articles intended for use in contact with food for a short time or a small contact area. Samples for such applications are conveyor belts, cover rolls, pressure- and suction hoses, valve-/container- or conduit-gaskets.

The **NR/SBR based rubber compound 2061** meets almost completely the requirements of §177.2600 CRF/FDA. The extraction tests regarding the suitability for fatty foods exceeds however the specification limit.

The **NR/SBR based rubber compound 2061** contains chemicals which can form nitrosamines during the cross-linking process. The resulting profiles may therefore release ppb-amounts of nitrosamines.

If it is intended to utilize compound 2061 as sealing gasket for packaging sensitive goods, such as foodstuffs or pharmaceuticals, a risk assessment should be made in order to avoid any adverse effects on the integrity of the packaged product.

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Tracking & tracing

All standard drums items produced after December 1st 2014, will be fitted with either an NR or EPDM gasket. Production date is indicated on the identification labels on the pallet and on every product in an engraved date clock on the base of the drums.

Pallet label with indication of lot number (same as date clock data on individual drums)

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1] Manufacturer’s name</td>
</tr>
<tr>
<td>2] Country of origin</td>
</tr>
<tr>
<td>3] Product code</td>
</tr>
<tr>
<td>4] Food grade</td>
</tr>
<tr>
<td>5] Material type</td>
</tr>
<tr>
<td>6] Date clock</td>
</tr>
</tbody>
</table>

Identification marks on base of individual drums
Based on the date clock, CurTec can trace the complete production batch data. The production batch data contains the unique article number of the gaskets (as mentioned on the product drawing).
Impact on existing UN markings

**UN markings which have been issued by TNO cover both NR/SBR and EPDM gaskets. Their UN reports contain details and approval.**

Recent UN markings have been issued by BVI and did not cover EPDM yet. The statement on the following page confirms that EPDM gaskets can be accepted as a valid alternative for NR/SBR gaskets and that they will not affect the UN markings issued.

Existing UN markings which are concerned are mentioned in the CurTec drum reference table.
Dear Sir,

With this writing, undersigned M. Wittebolle, General Manager of the Belgian Packaging Institute confirms what follows:

“Based on the experience with the containers having obtained a NL UN-certification, we can accept for all B UN-certified items mentioned below, the modification of the gasket in the lid from the actual mentioned material NR/SBR into EPDM under condition that they will have the same dimensions and quality (hardness and compressibility). The certificates involved are:

1H2/X20/S/---/B/CurTec 020001*
1H2/X90/Y135/Z180/S/---/B/CURTEC-060100*
1H2/X75/Y113/Z150/S/---/B/CURTEC-060100
1H2/X33/Y46/Z74/S/---/B/CurTec 060141
1H2/X22/Y30/Z30/S/---/B/CURTEC 070048
1H2/X64/Y96/Z144/S/---/B/CurTec 070063
1H2/X70/Y105/Z156/S/---/B/CurTec 070063
1H2/X75/Y112/Z168/S/---/B/CurTec 070063
1H2/X81/Y121/Z182/S/---/B/CurTec 070063
1H2/X95/Y142/Z213/S/---/B/CurTec 070063
1H2/X50/S/---/B/CURTEC-070177
1H2/X90/Y135/Z180/S/---/B/CurTec 070178
1H2/X75/Y113/Z150/S/---/B/CurTec 070178
1H2/X63/S/---/B/CURTEC-080027

Sincerely,

M. Wittebolle
General Manager
<table>
<thead>
<tr>
<th>Product code</th>
<th>Product Type</th>
<th>Capacity</th>
<th>UN-mark</th>
<th>UN-X max weight</th>
<th>UN-Y max weight</th>
<th>UN-Z max weight</th>
<th>Lid product code</th>
<th>EPDM gasket product code</th>
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<td>6 Ltr.</td>
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<td>7068</td>
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<td>68 Ltr.</td>
<td>UN 1236</td>
<td>X81</td>
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<td>7140</td>
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</table>

**xxxxC is code for Conductive Drums**

**CurTec Drums Reference Table**