Mounting Instructions for the Rail Seal Cover Strip

For Ball Rail and Roller Rail Systems
1. Safety and Symbols

1.1 Safety Notes and their Symbols
The following symbols are used to identify safety notes.

![WARNING!](image)
Risk of injury due to sharp edges!
Wear gloves!
Wear clean gloves!

![Caution!](image)
Risk of damage to Rail Seal, guide rail or adjoining structure!

1.2 Work Operations and their symbols
The following symbols are used to describe certain work operations.

![Visual inspection](image)
![Apply oil!](image)
Clean with dry and clean rag!

1.3 Cross-referencing symbols
The symbols below are used to identify repeat or follow-on work operations.

⇒ 3.1 See Section 3.1
⇒ 3.2.1 See Fig. (+ Text 3.2)

⇒ Note, recommendation
2. General Information

2.1 Advantages of the Rail Seal
The Rail Seal is easy to clip on and remove.
- This considerably facilitates and speeds up the mounting process:
  - no need to plug each single hole.
  - no time delay while waiting for adhesive to harden when using adhesive tape.
- The Rail Seal can be mounted and removed several times.
- Corrosion-resistant spring steel.
The Rail Seal is a precision-machined part that must be handled with great care. It must on no account be bent.

2.2 Versions/Functions
- These instructions apply to both the 0.15 mm and 0.3 mm Rail Seal
A Snap-fit Rail Seal (standard)
  - The Rail Seal is clipped on before the runner block is mounted and fits tightly.
B Sliding-fit Rail Seal
  - For mounting or replacing a Rail Seal when the runner block or aluminum framing cannot be removed.
  - A section of the snap-fit Rail Seal is very slightly widened and can then be easily slid under the runner block.

An arbor (available as an option) for 0.15 mm Rail Seals or a special expanding tool for 0.3 mm Rail Seals can be used to create the sliding fit after installation in order to be able to remove a Rail Seal.

The main advantage is that the length X of the sliding fit can be optimized to suit the installation conditions.

Observe the detailed mounting instructions!
3. Shipment

3.1 Guide Rails with Rail Seal

For one-piece guide rails:
One-piece guide rails are shipped with the Rail Seal clipped on, both ends angled down and with protective caps screwed on.

For composite guide rails:
A one-piece Rail Seal to cover the total length is supplied, together with the matching screws and washers, in a separate packing unit. The packing unit is marked with the same manufacturing job number as the labels on the guide rails. The Rail Seals have one angled-down and one straight end.

3.2 Separate Rail Seal 1619- (for storage/ replacement purposes)
Available lengths are given in table 3.2.2

Principle:
A matching Rail Seal can be supplied for each “recommended rail length” according to the length matrix in table 3.2.2.

If shorter guide rails are used, the Rail Seal will have to be shortened to suit.

Observe the overhang L1!

4.6. 3

Available Lengths of standard Rail Seals 1619-
Part numbers:
Snap-fit Rail Seal: 1619- 31-..
Size code
Length code
Ordering example:
- Guide rail size: 25
- Guide rail length: 2696 mm
Available length as per table:
2996 mm, length code 12
(0.15 mm Rail Seal)
Ordering data: 1619-231-12
The Rail Seal must be shortened to suit.
Observe L1!

Rail Seals with prefabricated sliding fit are available on request. 4.6. 3
Shipping condition of separate Rail Seals
(for storage, replacement, customer-designed structures)
- Short Rail Seals: shipped flat in self-locking cardboard boxes.
- Long Rail Seals: shipped rolled up in wooden crates.
Protective caps available as an option.
Part numbers ➞ 3.3.2

To protect the Rail Seals the packaging should be kept for use as a protective cover during mounting!

3.3 Protective Caps
Rexroth uses protective caps to secure the Rail Seal.
Protective caps can:
- prevent injuries
- prevent involuntary lifting of the Rail Seal and related ingress of dirt
- fix the Rail Seal in place
Mounting instructions ➞ 4.7

If protective caps cannot be mounted, secure the Rail Seal by other means. ➞ 4.7

Part numbers for protective caps

<table>
<thead>
<tr>
<th>Size</th>
<th>Ball Rail Systems</th>
<th>Roller Rail Systems</th>
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<tr>
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<td>1619-639-00</td>
<td>1619-639-20</td>
</tr>
</tbody>
</table>

3.3.2
4. Mounting Instructions

4.1 Basic Preparations

⚠️ Carefully clean all the mounting surfaces and the workplace before mounting!

4.2 Protecting the Rail Seal

⚠️ Do not bend the Rail Seal! Never attempt to remove the Rail Seal from its packaging by pulling on one end! Always discard any bent Rail Seals!

⚠️ Keep the packaging to use as a protective cover for Rail Seals during mounting!

⚠️ Before, during and after mounting, protect the Rail Seal from scratches, dirt, impacts, etc. Any impairment of the Rail Seal will shorten its service life!

⚠️ The Rail Seal can be protected by covering it with the following:
- its transport packaging
- a cable duct
- other means of protection
4.3 Mounting Instructions for Clipped-on Rail Seals
(according to Section 3.1)

Preparations for mounting one-piece rails:

- First carefully remove the guide rail with the Rail Seal from its packing crate.
- Slit the wrapping paper with a cutter and lift out the guide rail.
- Due to the protective caps, the Rail Seal has been precisely dimensioned to fit the length of the guide rail. Please take care always to remount a dismantled Rail Seal on the matching guide rail.
- Before installing the rail, remove the protective caps and set them aside for use later, then carefully peel off the rail seal from one end to the other. Use the lift-off plate for 0.3 mm rail seals!

<table>
<thead>
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<th>Size</th>
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<td>65</td>
<td>1619-610-60</td>
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⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges of the Rail Seal!

⚠️ Do not bend or scratch the Rail Seal!

⚠️ Lay the Rail Seal on a clean surface and cover it with its packaging or similar means of protection!

- Mount the guide rail.
- Check whether there is still anti-corrosion oil on the rail surface and re-apply if necessary.
The following applies to all Rail Seals:

⚠️ Check each rail seal prior to mounting! Discard any bent rail seals! When mounting the rail seal, start at the end of the rail where the runner block is to be slid on!

**Mounting Rail Seals on one-piece guide rails**

- Always remount the Rail Seal on its own guide rail.
- Position the rail seal on the rail end so that the bend in the seal tongue is flush with the end face.
- Clip on the first 20 to 50 mm.
- Check that the seal fits snugly and correct the fit if necessary.

*0.15 mm Rail Seal:*
- Exerting slight pressure on the outer edges, gently smooth the strip down along its entire length so that its edges snap into the grooves on both sides of the rail.

*0.3 mm Rail Seal:*
- Use new mounting tool
  
  ➤ 4.3.2 4.3.4

⚠️ Check that the seal sits tight all along the rail!

⚠️ The Rail Seal must fit snugly at the end of the rail! (No burrs permissible.) If it does not, proceed as follows:
- Lift up the end of the Rail Seal and gently ease the tongue downwards.
- Clip the Rail Seal back onto the rail.

**Mounting Rail Seals on composite guide rails (4.3.6)**

- Carefully remove the rail seal from its packing crate, position the angled-down tongue flush on the end face, and clip down onto the rail.
- Use a plastic mallet to angle the straight tongue down flush with the rail end. Do not cut the tongue off!
- If necessary, shorten the end of the tongue just enough to expose the tapped hole on the rail end face.

  ➤ 4.3.5

Up to runner block mounting:
- Keep Rail Seal covered! ➤ 4.2

After runner block mounting:
- Fit protective caps! ➤ 4.7
4.4 Mounting Instructions for separate, Snap-fit Rail Seals (according to Section 2.2 A and 3.2)

Starting point:
- initial installation
- already installed guide rail with defective Rail Seal from which the runner block (and any superstructure) has been removed
- A defective Rail Seal must be discarded and recycled.

⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges of the Rail Seal!

For custom-length Rail Seals:
Rail Seals can be delivered already cut to length. One end tongue is angled down, the other straight.
0.15 mm Rail Seal:
1619-.30-00, guide rail length
0.30 mm:
1619-.30-20, guide rail length

Before mounting:

⚠️ 4.2.1 4.3.3

⚠️ When mounting the Rail Seal, start at the end of the rail where the runner block is to be slid on!
- Position the rail seal on the rail end so that the bend in the seal tongue is flush with the end face.
- Clip on the first 20 to 50 mm.
- Check that the seal fits snugly and correct the fit if necessary.
- Then clip the rail down along its total length. 4.4.2
- Use a plastic mallet to shape the tongue flush round the rail end.

**Do not cut the tongue off**!
- If necessary, shorten the end of the tongue just enough to expose the tapped hole on the rail end face.

⚠️ The Rail Seal must fit snugly at the end of the rail! (No burrs permissible!) If necessary, correct the fit.

4.3.5
If the Rail Seal is too long:

- Mount the Rail Seal, starting at the end with the angled-off tongue.
  ➤ 4.4.2
- Mark the overhang \( L_v \) and initially cut the end off straight.
- Using the cut-off with the straight tongue as a template, cut the Rail Seal end to shape. Observe \( L_v \)!

⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges of the Rail Seal!

⚠️ Do not bend or scratch the Rail Seal!

- Use a grindstone to deburr the tops, bottoms and sides of the cut edges.

- Use a plastic mallet to shape the tongue flush round the rail end.
- If necessary, shorten the end of the tongue just enough to expose the tapped hole on the rail end face.

⚠️ The Rail Seal must fit snugly at the end of the rail! (No burrs permissible!) If necessary, correct the fit.
➤ 4.3.5

⚠️ Do not slide runner blocks on over the cut end of the Rail Seal, but always at the preformed and preshaped end!
➤ 5.1
- Mount the protective caps!
➤ 4.7

<table>
<thead>
<tr>
<th>( L_v ) (mm)</th>
<th>15</th>
<th>20</th>
<th>25</th>
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<td>6</td>
<td>5</td>
<td>6</td>
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<td>14</td>
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4.5 Dismantling of Snap-fit Rail Seals  
(with carriage installed)

For guide rails up to approx. 1000 mm:

- Guide rails up to approx. 1000 mm require no widening of the Rail Seal.
- First remove the protective caps. Do not discard these as they are reusable!
- Ease up the end of the Rail Seal.

⚠️ Do not bend the Rail Seal!
- Cut off the tongue only (as illustrated). Do not cut into the clip-on edges!
- To prevent any damage to seals when the Rail Seal is pulled out, use a grindstone to deburr the top and sides of the cut edge! Also check that there are no burrs on the clip-on edges!
- Pull the runner block with its superstructure as far as possible toward the end of the rail where you have cut off the Rail Seal tongue.
- At the other rail end, ease the Rail Seal off the rail and use pliers to pull it out from under the runner block.

⚠️ The Rail Seal is now unusable and should be recycled!

For guide rails of approx. 1000 mm and longer:

- First remove the protective caps. Do not discard these as they are reusable!
- Pull the runner block with its carriage to a distance of at least $L$ mm from one end of the rail.
- Ease off the Rail Seal at this end.

⚠️ Do not bend the Rail Seal!
- Cut off the tongue.

⇒ 4.5.1
• Widen the Rail Seal using the expanding tool with a wooden or plastic block as a support on the other side and pulling these simultaneously along the Rail Seal.
• For the 0.3 mm Rail Seal, use the special expanding tool! (in preparation)

⚠️ Do not bend the Rail Seal!

⚠️ The Rail Seal is now unusable and should be recycled!
4.6 Mounting Instructions for Sliding-Fit Rail Seals (according to Section 2.2 B)

Starting point (example):
A damaged Rail Seal has to be replaced although the runner block and its carriage cannot be removed.

Solution:
A sliding-fit section can be prepared at one end of the Rail Seal for mounting and removal purposes.

Preparing the Sliding-Fit of the Rail Seal
An expanding tool is used to widen a section at the tongue end of a snap-fit Rail Seal, which can then be easily slid under the runner block.

The expanding tool can be ordered as an option. See table for part numbers.

⚠️ Sliding-fit Rail Seals must be fixed in place with protective caps!

⇒ 4.7

1) An additional special expanding tool for the 0.3 mm Rail Seal is in preparation.

Calculating the length of the sliding fit
Maximum length of the sliding fit $L_{\text{max}}$:
This is limited by the manual pushing force. See table opposite.

Minimum length of the sliding fit:
$L_{\text{min}} = L_{\text{FW}} + \text{approx. 200 mm}$
(FW = runner block length)

In the smaller sizes up to size 25, the overall length of the carriage may necessitate a longer sliding-fit section in order to be able to push the Rail Seal the required distance.

⚠️ The length of the snap-fit section $L_f$ should be at least 300 mm!

Ordering data for rail seals supplied ex-factory with ready-made sliding fit:
0.15 mm Rail Seal:
1619-.30-.10, Snap-fit length, $L_{\text{min}}$

0.30 mm Rail Seal:
1619-.30-.30, Snap-fit length, $L_{\text{min}}$

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<th>Part numbers</th>
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<tr>
<th>Size</th>
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<td>15, 20, 25, 30, 35</td>
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<td>1800</td>
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<td>55, 65</td>
<td>2000</td>
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</table>
Preparing the Sliding-Fit section (continued)

⚠️ Place the Rail Seal with its edges pointing upward on a flat, clean surface!

- Insert the expanding tool into the Rail Seal at the transition point between the snap-fit and the sliding-fit sections, initially with the flat edges of the tool parallel to the Rail Seal edges. Then turn the tool 90° to the right (thread) and push down and out to widen the Rail Seal toward the end, while holding the Rail Seal down with the other hand.

⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges of the Rail Seal!

For longer sliding-fit sections:

⚠️ The best solution is for two people to carry out the operation, one person holding down the Rail Seal while the other pushes the expanding tool.

Alternatively, one person working alone can widen the Rail Seal bit by bit.

⚠️ Make sure the supporting surface is flat and clean!

⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges of the Rail Seal! Take care not to let the expanding tool slip, otherwise you may cause burrs on the clip-on edges and risk damaging runner block seals!

Checking the Sliding Fit

Generally, the expanding tool needs to be drawn through only once for optimum sliding capability and a good fit.

- Push the sliding section a little way onto the guide rail, always starting at the end of the rail!

⚠️ If the Rail Seal does not slide on easily, there is a risk of it bending or not achieving the proper sliding-fit length! In this case, the sliding fit must be widened once more! For 0.3 mm Rail Seals: Use the special tool for repeated widening ➤ 4.6. 2

⚠️ Caution: Wear gloves to avoid cutting hands on sharp edges and ends of the Rail Seal.
Mounting the Sliding-Fit Rail Seal

- Push the runner block with the carriage to the other end of the rail, positioning the sealing lip of the first runner block over a mounting screw hole.

- Before sliding on the Rail Seal, make sure that the seal tongue is angled slightly downward to ensure it can be easily slid under the sealing lip of the runner block.

- Push the sliding-fit end of the Rail Seal onto the guide rail, starting at the end of the rail!

- Slide the whole length of the sliding-fit section onto the rail up to the runner block, while holding up the snap-fit section with the other hand.
- Slide the Rail Seal under the first runner block.
- Keep repositioning the carriage so that the sealing lip of the next runner block is above a mounting screw hole.
- Slide the Rail Seal under the remaining runner blocks until the tongue of the Rail Seal projects beyond the end of the rail. Observe the overhang $L_V$ as given in the table.

- Exerting slight pressure on the outer edges, now gently smooth down the snap-fit section of the Rail Seal along its entire length so that its edges snap into the grooves on both sides of the rail.
- If necessary, shorten the projecting end of the Rail Seal.

⚠️ Check that the seal fits snugly all along the rail!

- Angle down the Rail Seal tongue.

- Fit the protective caps.

<table>
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<th>$L_V$ (mm)</th>
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<tbody>
<tr>
<td>15</td>
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<td>65</td>
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0,3 mm
4.7 Securing the Rail Seal

- Rail Seals should preferably be secured using protective caps (1)!
  Guide rails come with pre-drilled and tapped holes in their end faces.

If it is not possible to mount protective caps:

2. Fasten the tongue directly to the rail end face using the screws and washers provided with the protective caps (2).

Alternative (equivalent, to be performed by customer):

3. If it is not possible to secure the Rail Seal on the rail end face, it may be secured on the rail top:
   - Drill a 3.3 mm diam. hole through the Rail Seal into the rail.
   - Widen the hole in the Rail Seal to 4.5 mm diam.
   - Tap an M4 thread, remove drillings, and secure Rail Seal with a screw (3).
   or:
   - First proceed as in 3.), then machine an additional 90° countersink, remove drillings, and screw down Rail Seal using a countersunk screw (4).

⚠️ For all fixing methods without protective caps: seal off the Rail Seal end (bevel cut) with high-viscosity oil (or similar) to prevent any ingress of dirt!

⚠️ Limit the stroke to ensure the runner block will not run right to the rail end (bevel cut of the Rail Seal) or over the countersunk screw, otherwise the seals could be damaged. Observe dimension $L_s$ (5)!

Before mounting the runner block:

- Oil or grease the chamfers and the Rail Seal at the end face of the guide rail as well as the runner block seal lips.
5. Mounting Instructions for Roller Runner Blocks

5.1 Mounting the runner block

The runner block is supplied complete with a plastic mounting tool (mandrel).

⚠️ Keep the mandrel in the runner block until the time comes to slide the runner block onto the guide rail! If the mandrel is prematurely removed, the rolling elements (rollers) may fall out!

Before mounting the runner block:

- Oil or grease the inner and outer sealing lips on the runner block. Only pull the mandrel out as far as necessary to expose the seals!
- Oil or grease the chamfers and Rail Seal on the end face of the guide rail.
- Position the runner block, with its mandrel inserted, at one end of the rail.

⚠️ Always push the runner block onto the end of the rail with the ready-made angled-down Rail Seal tongue! Never attempt to push the runner block over a cut end or one you have shaped yourself, as this may result in damage to the sealing lip and cause the runner block to fail! The Rail Seal must fit snugly around the end of the guide rail!

- Push the runner block onto the rail. As this is done, the mandrel will be pushed out of the runner block by the guide rail.

5.2 Removing the runner block

⚠️ Slide the runner block off the guide rail and onto the mandrel! Once removed, a runner block should always be stored with the mandrel inserted!