The Drive & Control Company

Rexroth
Bosch Group

Profiled Rail Systems

- Ball Rail Systems
- Roller Rail Systems
- Miniature Ball Rail Systems
- Cam Roller Guides
- Cover Strip

Instructions

R320103885/2016-09
EN

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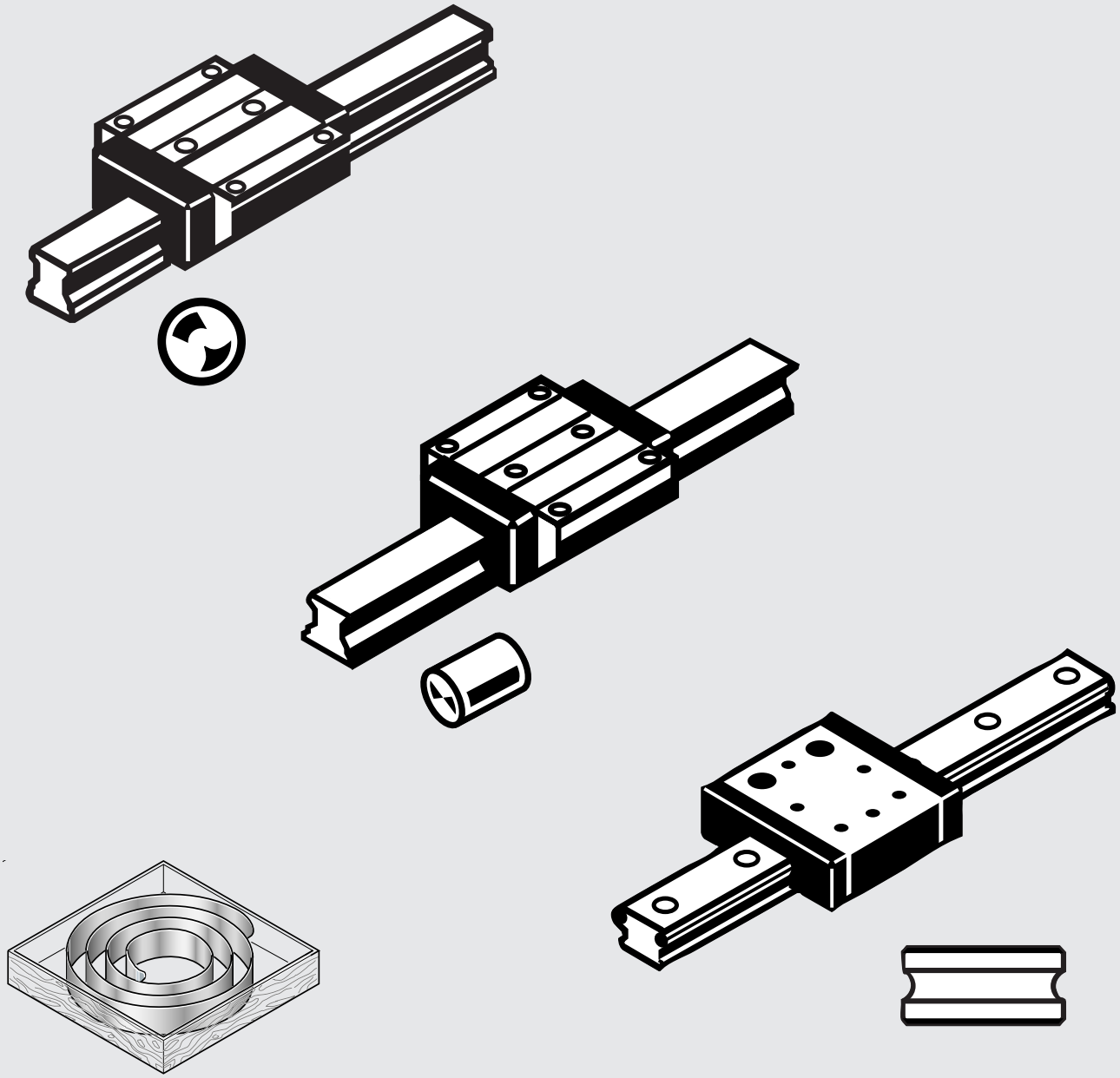
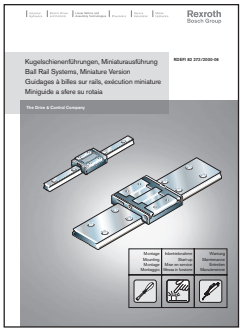


These instructions replace the following instructions:

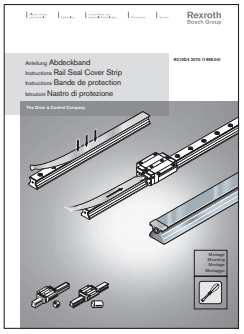
Instructions
Ball Rail Systems
R320103095

Roller Rail Systems
R320103096



Instructions for
Ball Rail Systems,
Miniature Version
R320103183

Instructions for
Cam Roller Guides
R320103093



Instructions for
Rail Seal Cover Strip
R320103110

Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
BSHP	BSHP ball rail system	RS	Roller guide rail
BSCL	BSCL ball rail system	M_A	Tightening torque
RSHP	RSHP roller rail system	FW	Runner block
MKS	Miniature ball rail system	FS	Guide rail
LRF	Cam roller guide	KSF	Ball rail system
KW	Ball runner block	RSF	Roller rail system
RW	Roller runner block		
KS	Ball guide rail		

Die vorliegende Anleitung ist in folgenden Sprachen verfügbar.
These operating instructions are available in the following languages.
Les présentes instructions de service sont disponibles dans les langues suivantes.
Le presenti istruzioni per l'uso sono disponibili nelle lingue seguenti.
El presente manual de instrucciones está disponible en los siguientes idiomas.
As presentes instruções de serviço estão disponíveis nas seguintes línguas.

DE	German (Original document)
EN	English
FR	Français
IT	Italiano
ES	Español
PT	Português
ZH	Chinese

This data has been provided solely for the purpose of product description. No statement regarding any particular quality or suitability for any particular use can be derived from this information.
The information does not release the user from making his/her own inspections and evaluations. It should be noted that our products are subject to a natural process of aging and wear and tear.

The title page contains an illustration of a sample configuration. The product as delivered can differ from the illustration.

The original instructions are in the German language.

1 About these Instructions

1.1 Scope and purpose of the documentation

This documentation applies to the following products:

- Ball rail systems, roller rail systems, miniature ball rail systems, cam roller guides, cover strip according to relevant catalog. See 2.3.

This documentation is intended for assembly/installation personnel, line operators and machinery/plant users.

This documentation contains important information for proper and safe installation, operation, maintenance and deinstallation of the product and for troubleshooting simple errors oneself.

▶ Before working with the product, be sure to read these Instructions carefully and completely.

1.2 Required documentation

Documentation which is indicated by the book symbol 📖 must be obtained before handling the product and must be adhered to:

	Title	Document number	Document type
📖	Ball Rail Systems (BSHP/BSCL), Roller Rail Systems (RSHP), Miniature Ball Rail Systems, Cam Roller Guides	See 2.3	Catalog
📖	Material safety data sheet for Dynalub 510	R320103160	Material safety data sheet
📖	Product data sheet Dynalub 510	R310DE2052	Product data sheet
📖	Material safety data sheet for Dynalub 520	R320103161	Material safety data sheet
📖	Product data sheet Dynalub 520	R310DE2053	Product data sheet
📖	System documentation of the machinery/system manufacturer		
📖	Manuals for the other machine/system components		

The Rexroth documentation is available for download at www.boschrexroth.com/mediadirectory.

1.3 Standards

The following standards must be observed: DIN 637

1.4 Presentation of information

To enable users to work rapidly and safely with the product while following these instructions, this documentation uses standardized safety instructions, symbols, terms and definitions, and abbreviations. These are explained in the following sub-sections.

1.5 Safety notices in these Instructions

These Instructions contain safety (warning) notices preceding any actions that involve a risk of personal injury or damage to property. The safety precautions described must be adhered to.

Warning notices are structured as follows:

⚠ SIGNAL WORD

Type of hazard!

Consequences if ignored.

▶ Hazard avoidance precautions.

- Safety alert symbol: draws attention to the hazard
- Signal word: indicates the severity of the hazard
- Type of hazard: indicates the type or source of the hazard
- Consequences: describes the consequences that may occur if the hazard avoidance precautions are ignored
- Hazard avoidance precautions: indicates how to avoid the hazard.

The warning notices cover the following hazard levels. The hazard level describes the risks involved if the warning notice is ignored.
Hazard levels as per ANSI Z535:

Safety alert symbol, signal word	Meaning
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Damage to property: Risk of damaging the product or the surrounding environment.

1.6 Symbols

The following symbols designate notes or cross-references that are not safety-relevant but increase the clarity of the documentation.

Meaning of the symbols

Symbol	Meaning
	If this information is not observed, the product will not be used optimally.
▶	Single, independent work step
	Note
1. 2. 3.	Numbered work steps The sequence of the work steps is indicated by the numbers.
➠ 7	See section 7
➠ ☒ Fig. 7.1	See figure 7.1
	Screw with strength class...
⊘	Tightening torque
μ	Friction factor for screws

1.6.1 Pictograms

The following pictograms are used in this document:

Symbol	Meaning
	Take note of the additional information given in the catalog
	Risk of injury due to sharp edges
	Wear gloves
	Pay attention to cleanliness/clean product
	Visual inspection
	Parts may heat up considerably during operation. Let them cool down before touching or wear suitable protective clothing (e.g. heat-resistant protective gloves) to protect yourself from burns.

1.6.2 Notes

General notes, notes on proper usage and improper usage as well as general safety notices can be found in the relevant catalog.

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2 Overview

2.1 BSHP, RSHP, BSCL, and MKS – overview

1 Various guide rail versions. E.g. ones that can be mounted from above, below, ones with a cover strip or mounting hole plugs, etc.

2 Guide rail accessories.
E.g. mounting hole plugs, cover strips, terminal/wedge profile strips, etc.

3 Runner blocks with various designs (e.g. FNS,FLS, ...,).

4 Accessories for runner blocks (e.g. scraper plates, FKM and NBR seals, etc.)

A detailed overview of products/accessories as well as their description and technical data can be found in the relevant catalog.

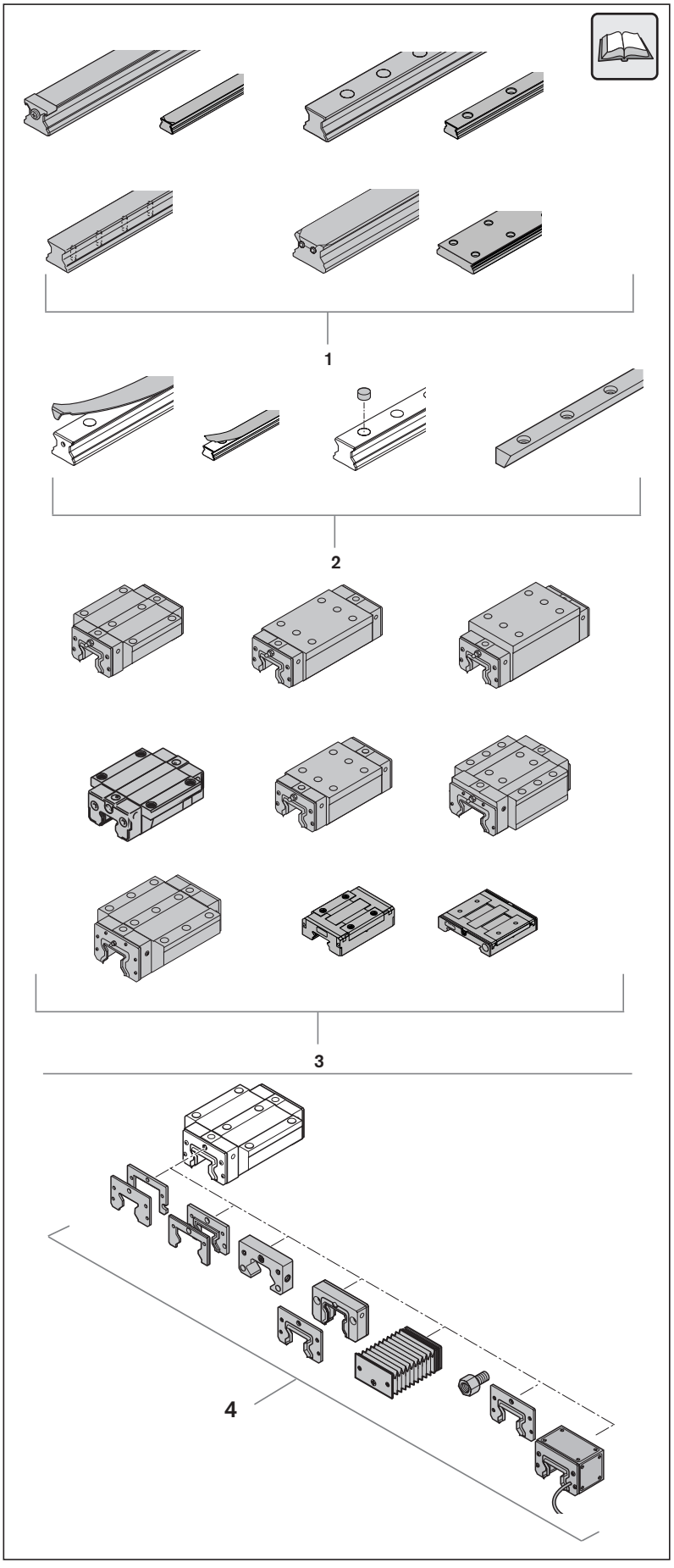


Fig. 1: **Overview (examples) of BSHP, RSHP, BSCL, MKS**

2.2 LRF – overview

1 Standard guide rails
2 Guide rails with T-slot
3 Low-profile guide rails
4 U-type guide rails
5 Standard half-rail guide rails
6 Low-profile half-rail guide rails
7 Wide guide rails
8 Mounting hole plugs
9 Standard runner blocks
10 Super runner blocks
11 Profile runner blocks
12 U-form runner blocks
13 Single bearing runner blocks
14 Double bearing runner blocks
15 Dead stops
16 Cam rollers with central spigot
17 Cam rollers with eccentric spigot

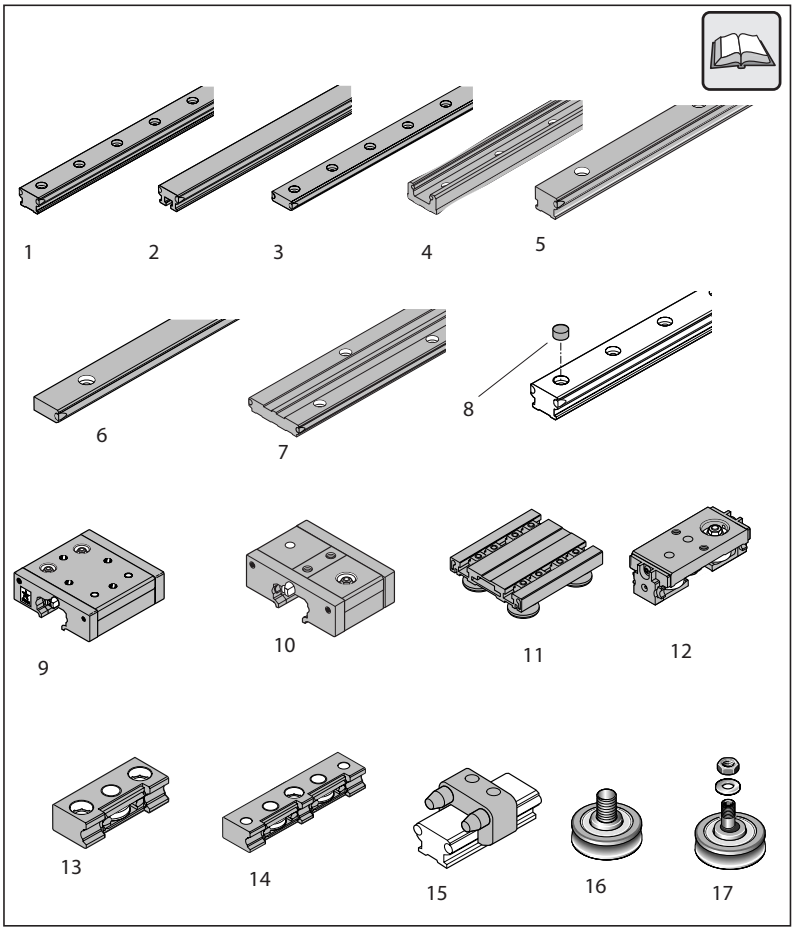


Fig. 2: **Cam roller guides – overview**

2.3 Ordering

For details on how to order components and accessories, see the relevant catalog.

- For BSHP ball rail systems: see the “Ball Rail Systems” and “NRFG Ball Rail Systems” catalogs
- For BSCL ball rail systems: see the “BSCL Ball Rail System” catalog
- For RSHP roller rail systems: see “Roller Rail System” catalog
- For ball rail systems, miniature version: see “Ball Rail Systems, Miniature Version” catalog
- For cam roller guides: see “Cam Roller Guides, Miniature Version” catalog
- Catalogs: Please contact your local sales partner.

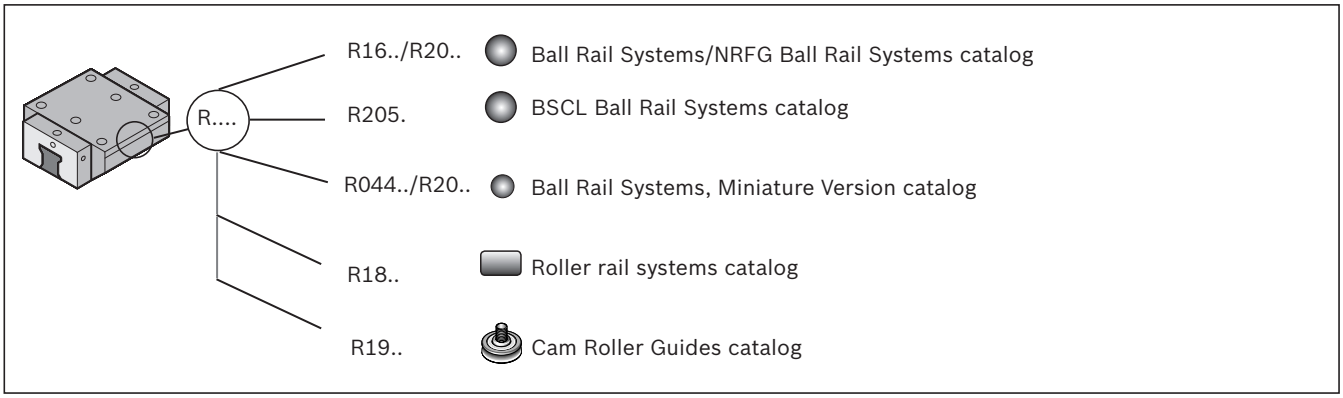


Fig. 3: **Ordering/catalogs**

3 Delivery

3.1 Delivery of guide rails

⚠ WARNING

Guide rails are heavy

Risk of injury.

- Use lifting/hoisting equipment (5/6/7) as appropriate for the weight or length of the guide rail!

⚠ CAUTION

Risk of injury when handling the cover strip

Risk of minor injuries.

- Wear gloves
- Avoid uncontrolled whipping of the cover strip (3) by holding down the cover strip ends.

NOTICE

Deflection of the guide rails

Damage to the product

- Use suitable lifting/hoisting equipment (7) for guide rails > 3000 mm in length to avoid deflection.

- One-piece guide rails with cover strip: The cover strip is already clipped on; protective caps are provided in the package (1).
- Composite guide rails: Matching sections of a composite guide rail are identified by a label on the packaging. For guide rails (2) with cover strip, the cover strip is supplied in one piece, matching the overall length, together with protective caps, screws and washers, in its own packaging (4) which is labeled with the same production job number as the ball rail systems.

Transporting / Unpacking
Do not recycle packaging until mounting has been completed! The packaging can protect not yet mounted guide rails or cover strips while mounting work is in progress.

BSHP	(kg/m)
15	1.4
20	2.4
25	3.2
30	5.0
35	6.8
45	10.5
55	16.2
65	22.4
20/40	5.3
25/70	11.6
35/90	21.0

BSCL	(kg/m)
15	1.2
20	1.8
25	2.6
30	3.6
35	5.1
45	7.7

RSHP	(kg/m)
25	3.1
30	4.3
35	6.3
45	10.3
55	13.1
65	17.4
55/85	24.7
65/100	34.7
100	42.5
125	75.6

MKS	(kg/m)
7	0.22
9	0.33
12	0.61
15	0.97
20	2.11
Wide	
9	0.92
12	1.45
15	2.86

LRS	(kg/m)
20	0.60
25	1.00
32	1.60
52 / 52-h / 52-sh	3.60

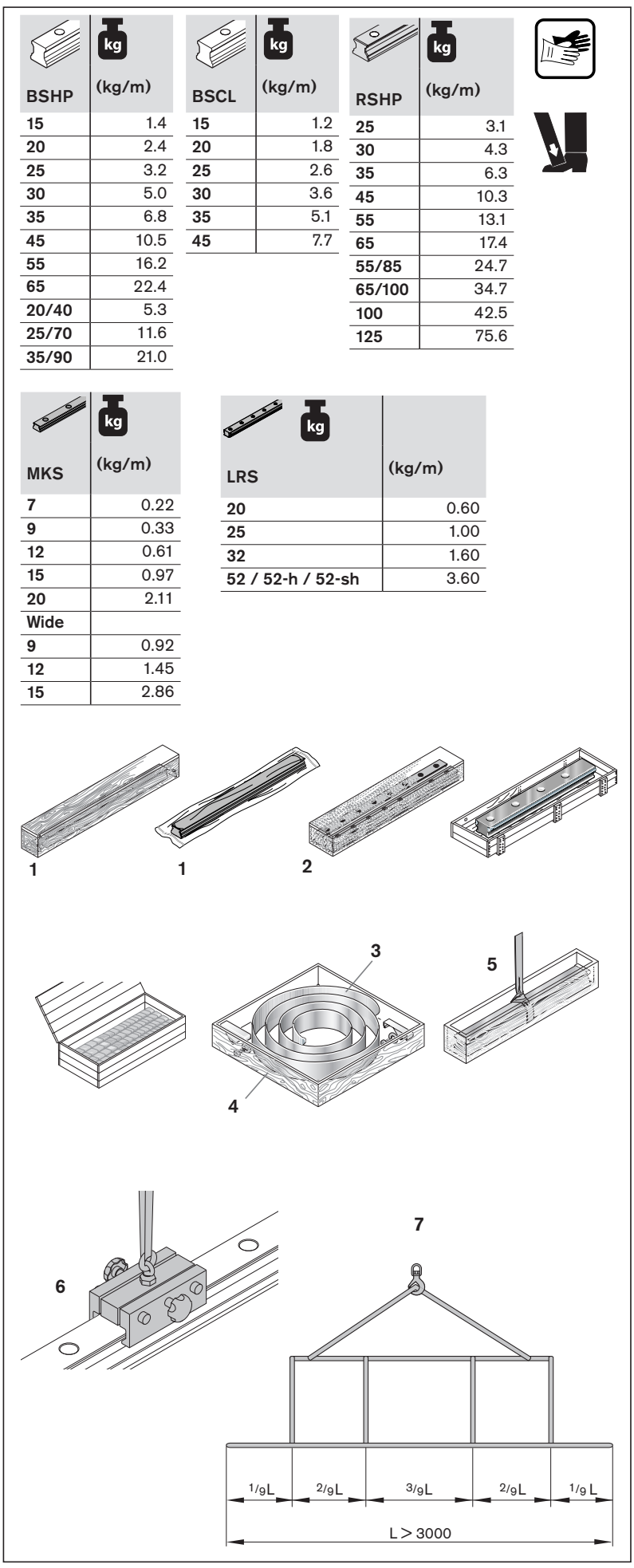


Fig. 4: **Weight and delivery of guide rails**

3.2 Delivery of runner blocks

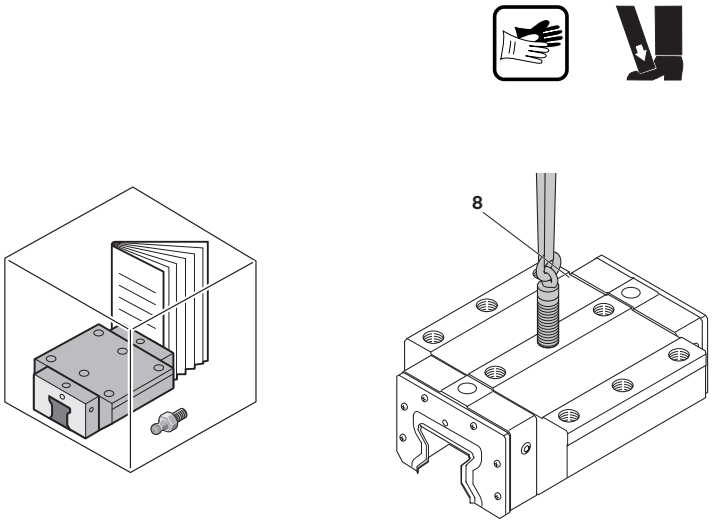
⚠ WARNING

Runner blocks are heavy

Risk of injury.

- Use lifting/hoisting equipment as appropriate for the weight of the runner blocks!
  (Do not damage the runner block surface)

When using lifting equipment to transport the runner block, lifting bolts (8) that can be screwed into the threads on the runner block are useful in addition to a suitable lifting sling.



BSHP	(kg)
15	max. 0.30
20	max. 0.55
25	max. 0.90
30	max. 1.50
35	max. 2.25
45	max. 4.30
55	max. 7.50
65	max. 14.15
20/40	max. 0.40
25/70	max. 1.20
35/90	max. 3.70

BSCL	(kg)
15	max. 0.25
20	max. 0.53
25	max. 0.80
30	max. 1.31
35	max. 2.11
45	max. 4.11

RSHP	(kg)
25	max. 0.93
30	max. 1.67
35	max. 2.70
45	max. 5.15
55	max. 7.15
65	max. 20.30
55/85	max. 11.50
65/100	max. 20.70
100	max. 42.00
125	max. 89.80

LRF	(kg)
20	max. 0.20
25	max. 0.25
32	max. 0.56
42	max. 1.03
52	max. 1.50
52-h	max. 2.60
52-sh	max. 3.30

MKS	(g)
7	max. 14
9	max. 41
12	max. 76
15	max. 170
20	max. 177

Fig. 5: **Weight and delivery of runner blocks**

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4 Mounting the guide rails

4.1 Preparation

- Take note of the weight and length of the guide rail ➠ 3.1
- Carefully remove guide rails from the packaging. Use slings or suitable lifting claws (5/6/7). Do not damage the guide rail surfaces.

⚠ CAUTION

Risk of injury when using unsuitable tools (4)

Minor injuries to hands.

- Wear gloves

NOTICE

Unsuitable tools (4)!

Damage to the guide rail

- Use a suitable tool to cut through the wrapping paper.

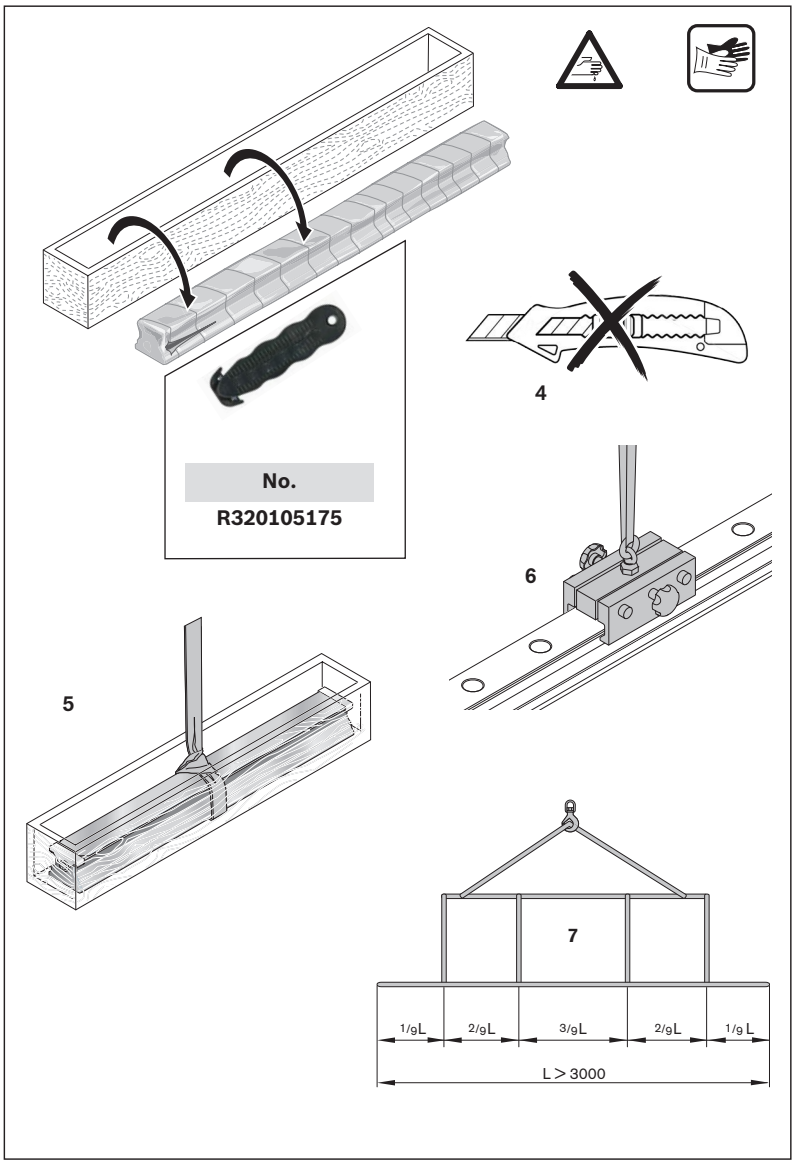

Fig. 6: **Preparations for mounting the guide rails**

4.1.1 Preparations for mounting guide rails delivered as sets

- Lay out the guide rails belonging to one set.

Identification scenario 1::
Each guide rail in a set is marked with a consecutive number (on the packaging (1) and on the rail (2)).

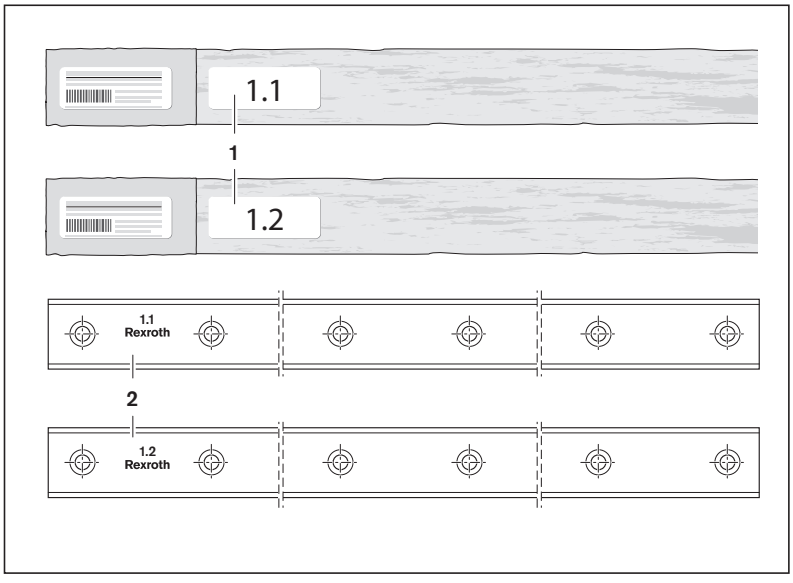

Fig. 7: **Laying out the guide rails delivered as a set**

4.1.2 Preparing composite guide rails for mounting

⚠ CAUTION

Sharp-edged joints (1)

Minor injuries to hands.

- Wear gloves

The joints (1) are numbered consecutively (2). For guide rails with two sections, the stamp (3) is located on both sections (5). All sections of a guide rail comprising three or more sections have the same number (4). The stamp (3) is located on both end pieces (6).Matching sections of a composite guide rail are identified by a label on the packaging.

- Lay out the guide rails belonging to one set.
- Sort sections
- RSHP: Use aligner bars (9) to align the guide rails when the mounting base (7) has no reference edge (8).

To order aligner bars, see roller rail systems catalog.

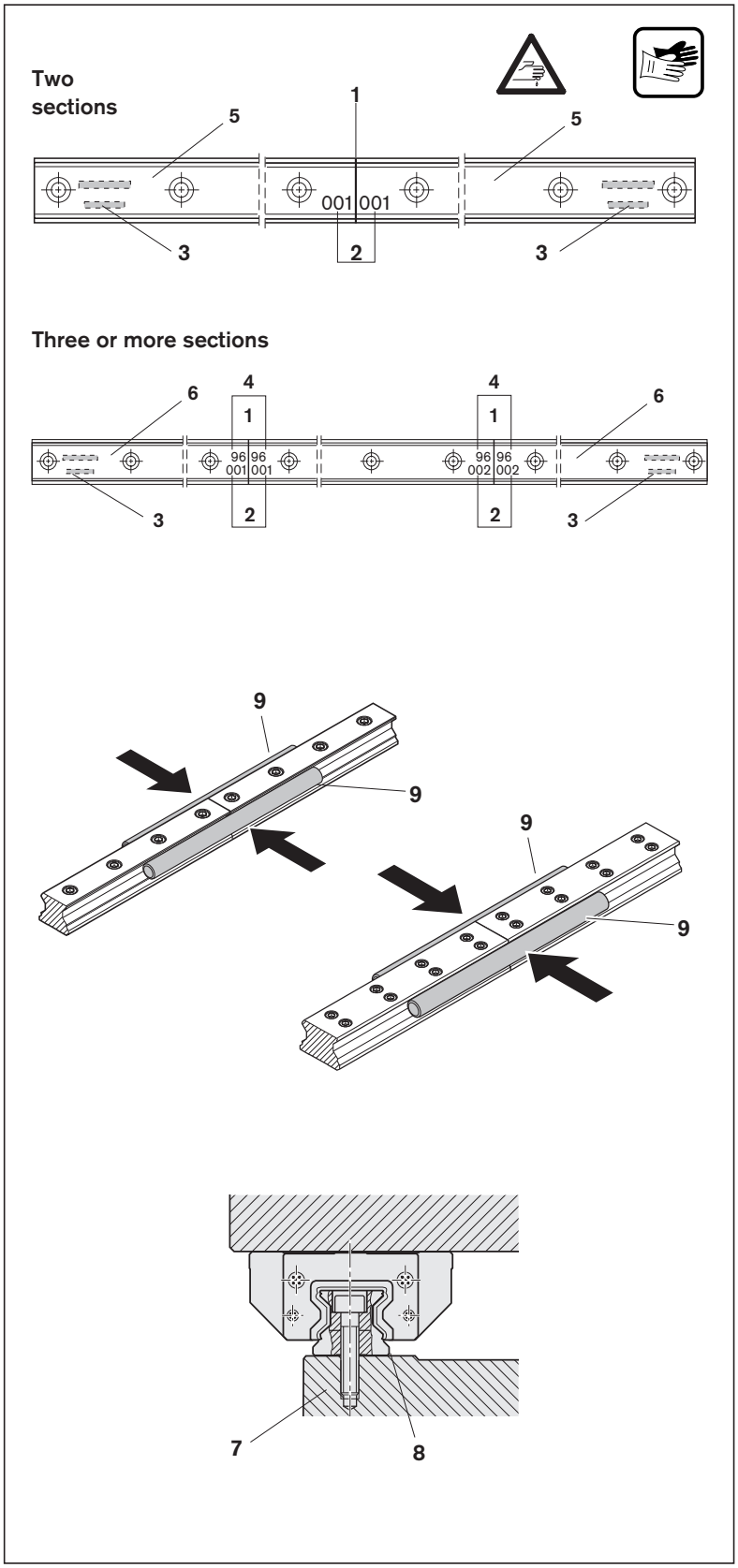

Fig. 8: **Laying out the composite guide rails**

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4.2 General mounting instructions

Guide rails with ground reference surfaces can be mounted to a reference edge (1) for lateral retention.
Guide rails without lateral retention have to be aligned straight and parallel when mounting, preferably using a straightedge.

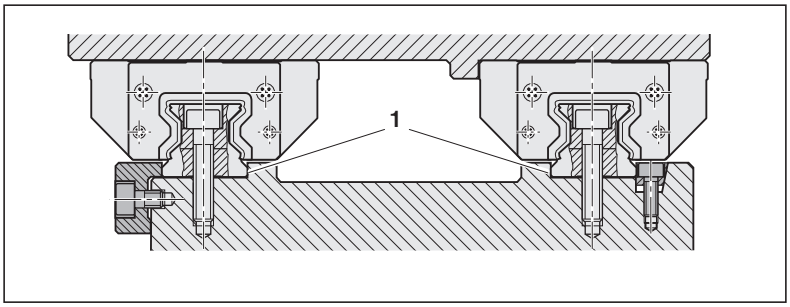

Fig. 9: **General guide rail mounting instructions**

4.3 Preparing the adjoining structure

1. Drill holes / tap threads into the supporting structure for fastening of the guide rail. For dimension data, see catalog.
2. Check the corner radii r_1, heights of reference edges h_1, and supporting and reference surfaces.
3. Carefully hone the mating surfaces for the guide rail and clean them thoroughly. Hone using a honing stone (grain size 200/300) or an oil stone.

Contamination, out-of-flatness (material displaced by damage to the surface) or burrs are not permitted.

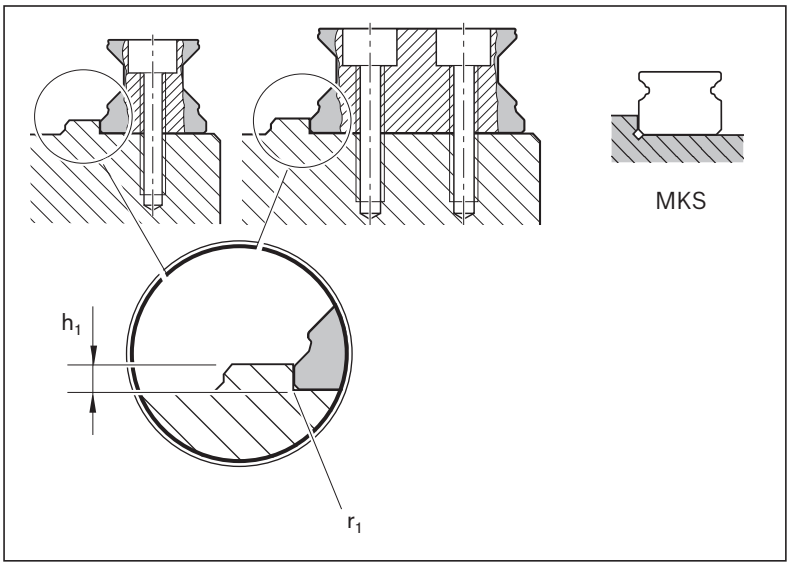

Fig. 10: **Preparing the adjoining structure**

4.4 Mounting BSHP, RSHP, BSCL and MKS guide rails

⚠ WARNING

Excessively high loads and moments may cause the limits for screw connections to be exceeded.

Risk of injury or death due to falling rail system.

- Screw connections must be recalculated and verified during design calculations. See catalog.

⚠ CAUTION

Risk of injury due to sharp edges on end faces of guide rails

Minor injuries to hands.

- Wear gloves

1. For guide rails with pre-mounted cover strip (Rail Seal), remove the cover strip. See Chapter 9. Chamfer the end faces of the guide rails if necessary and round off transitions (remove all burrs).
2. For composite guide rails, hone the end faces of the joints. Then clean the joint faces and apply a thin coat of oil to them.
3. Check supporting and reference surfaces of the guide rails.

Hone using a honing stone
(grain size 200/300) or an oil stone.

NOTICE

Damage to the runner block! (seals)

Damage to the product

- For deliveries of BSHP/RSHP guide rails in factory lengths/packaging units, the rail ends must be chamfered according to Fig. 11.
  For more information on this see the “Easy Customizing R3201031592 catalog”.

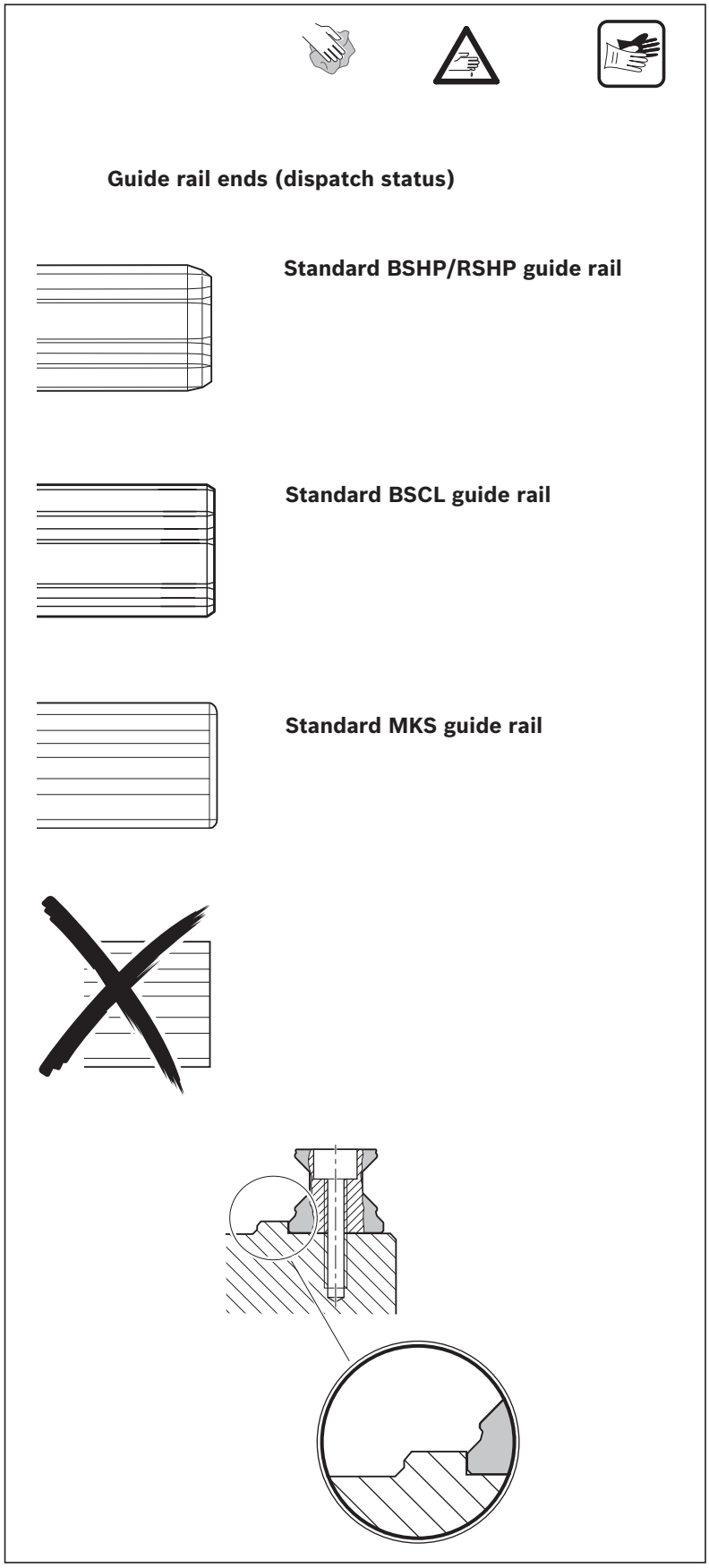

Fig. 11: **Preparing the guide rails**

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▶ Select and lay out screws ready to mount the guide rails.

Do not use washers!

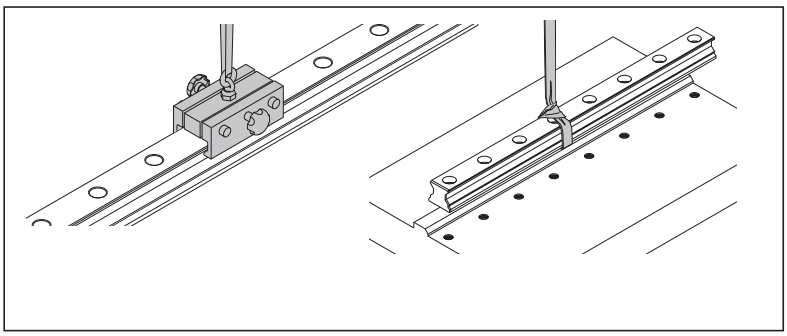


Fig. 12: **Attaching the guide rails**

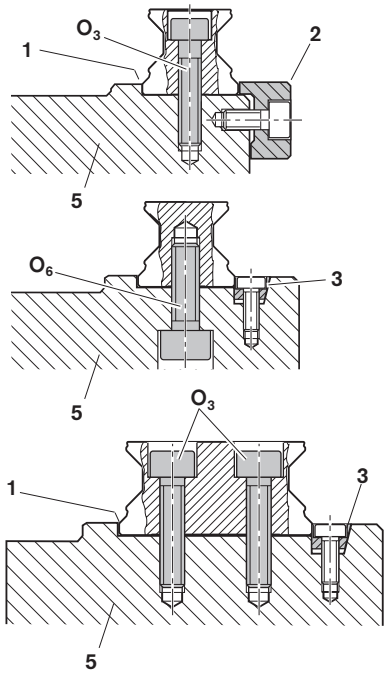
Composite guide rails:

1. Preparing guide rails for mounting ➠ 4.1.2

Mounting the guide rail:

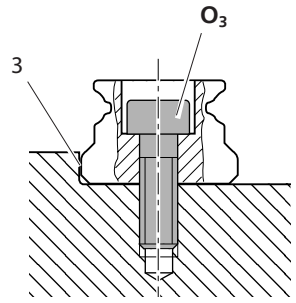
2. Carefully set the guide rails down on the supporting structure (5) (consider the weight and length of the guide rails) ➠ 3.1
3. Press the guide rails against the reference edge (1) and tighten the screws (O_3 / O_6) lightly, working from the middle to the outside. For lateral retention, either the right or the left reference surface of the guide rails can be used.
4. If necessary, fix the guide rails in place with clamping strips (2) or wedge profile retaining strips (3).
5. Guide rails without any lateral retention are to be aligned straight and parallel, preferably using a straightedge.
6. Tighten the screws to the specified tightening torque M_A! ➠ Fig. 14.
7. Secure the screws in the case of vibrations or impacts.

BSHP / RSHP / BSCL



Size BSHP/ RSHP/ BSCL	O_3 ISO 4762 (DIN 912)	O_6 ISO 4762 (DIN 912)
15	M4x20	M5x12
20	M5x25	M6x16
25	M6x30	M6x20
30	M8x30	M8x20
35	M8x35	M8x25
45	M12x45	M12x30
55	M14x50	M14x40
65	M16x60	M16x45
20/40	M4x20	M5x12
25/70	M6x30	M6x20
35/90	M8x35	M8x25
55/85	M12x30	-
65/100	M14x35	-
100	M24x100	-
125	M30x120	-

MKS



Size MKS	O_3 ISO 4762 (DIN 912)
7	M2x5
9/M3	M3x8
12	M3x8
15	M3x10
20	M5x14
Wide	
9	M3x8
12	M4x10
15	M4x12

Fig. 13: **Mounting the guide rails**

Tightening torques for profiled rail systems (as per DIN 637)

The tightening torques M_A for screw strength class 8.8 correspond to DIN 637. The tightening torques for screw strength classes 10.9 and 12.9 were calculated for the dimensions of a Rexroth rail system.

Input values for calculation:

- Friction coefficient in thread μ_G = 0.125
- Friction coefficient on top surface μ_K = 0.125
- Friction coefficient in joint μ_T = 0.125
- Torque wrench tightening factor α_A = 1.5

	M_A (Nm) for BSHP/RSHP/BSCL at strength class		
	8.8	10.9	12.9
M4	3	4.4	5.2
M5	6	8.9	10
M6	10	15	17
M8	25	36	43
M10	49	71	83
M12	83	120	140
M14	130	200	230
M16	200	300	350
M20	410	590	690
M24	710	1000	1170
M27	1040	1490	1740
M30	1400	1990	2330

	M_A (Nm) for MKS at strength class	
	A2-70	12.9
M2	0.35	0.5
M3	1.10	2.1
M4	2.00	4.6
M5	3.90	9.5

Fig. 14: **Tightening torques for profiled rail systems**

4.5 Mounting the wedge profile retaining strips

▶ Mount wedge profile retaining strip (1).
Take note of the torque M_A ➠ 14

The wedge effect multiplies the lateral clamping force. Tighten the mounting screws of the guide rails and the wedge profile screws in stages, alternating between them.

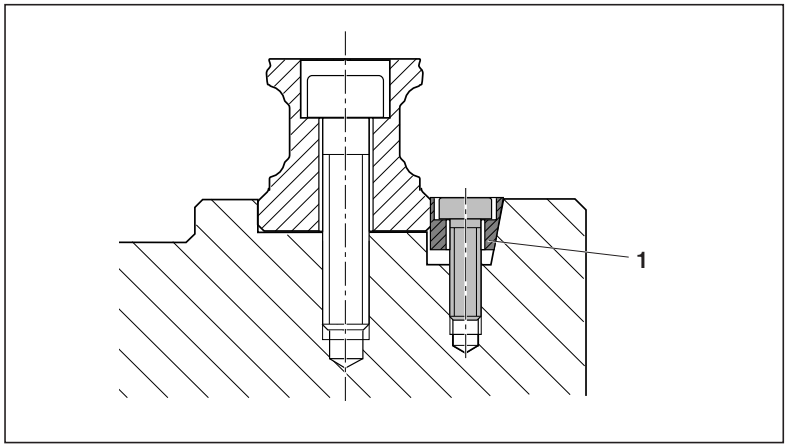


Fig. 15: **Mounting the wedge profile retaining strips**

4.6 Mounting and aligning parallel guide rails

The parallelism of the mounted guide rails must be checked using mounting runner blocks or runner blocks before plugging the mounting holes.

Requirement: The first guide rail must already be aligned and mounted. See catalog for values.

If roller runner blocks are to be used to check the parallelism, take note of the instructions in section 5. The parallelism offset $\mathbf{P_1}$ causes a slight rise in the preload on one side of the assembly. As long as the values specified in the catalog table are met, the effect of this on the service life is generally negligible

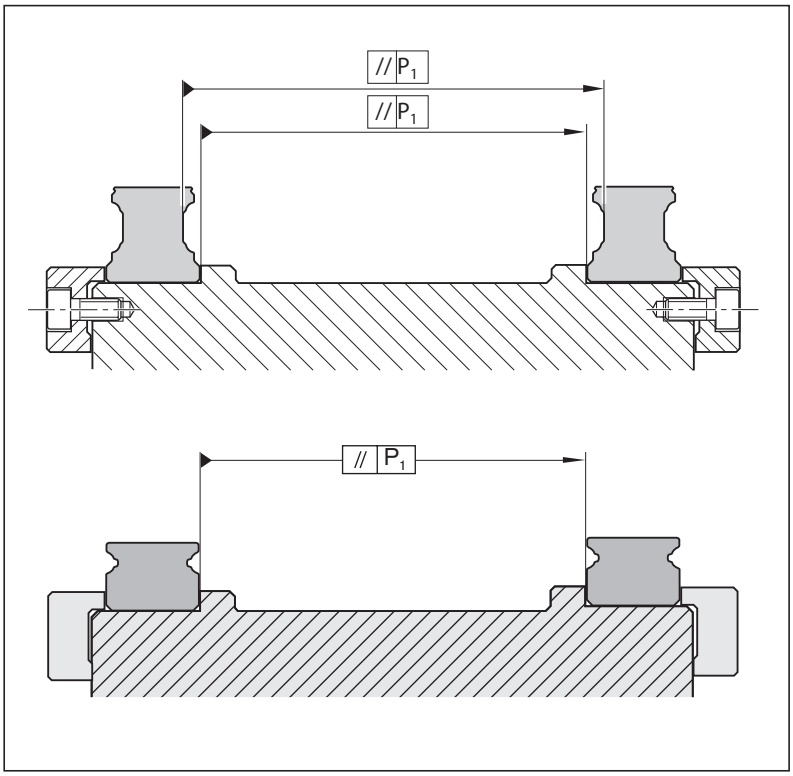


Fig. 16: **Checking the parallelism of the guide rails**

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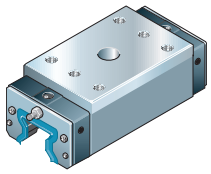
Mounting with mounting runner block

- The central hole D in the mounting runner block allows precise measurement of the relative rail position. The rail mounting screws can also be driven down through this hole.



Size	Mounting runner block Material number
25	R1829 220 27
30	In preparation
35	R1829 320 39
45	R1829 420 53
55	R1829 520 14
65	R1829 620 04

Fig. 17: **Mounting runner block (only for roller rail systems)**

Aligning the rails

1. Align and mount the first guide rail using a graduated straightedge.
2. Take note of the instructions for mounting the runner blocks ➠ 5.
3. Set up a mounting bridge with dial gauge between the runner blocks.
4. Move both runner blocks in parallel.
5. Align the ball guide rail manually until the dial gauge shows the correct dimension.
6. Tighten guide rail to tightening torque M_A. (use the mounting runner block for RSHP versions).

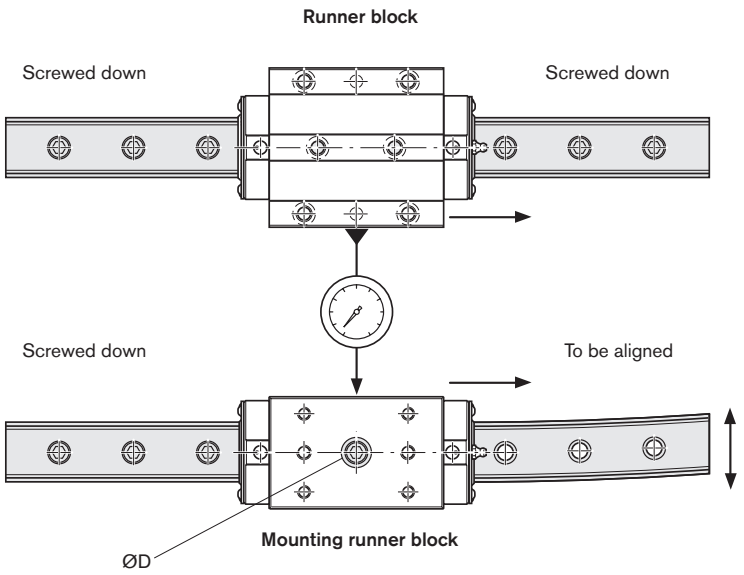


Fig. 18: **Aligning and mounting the guide rail**

4.7 Checking the vertical offset

The actual vertical offsets S_1 and S_2 must be checked using mounting runner blocks or ball runner blocks before plugging the mounting holes in the guide rail (3) ➠ 5.

Provided the vertical offset is kept within the stated maximum tolerances for the transverse (S_1) and longitudinal (S_2) directions, its influence on the service life can generally be neglected.
See catalog for values.

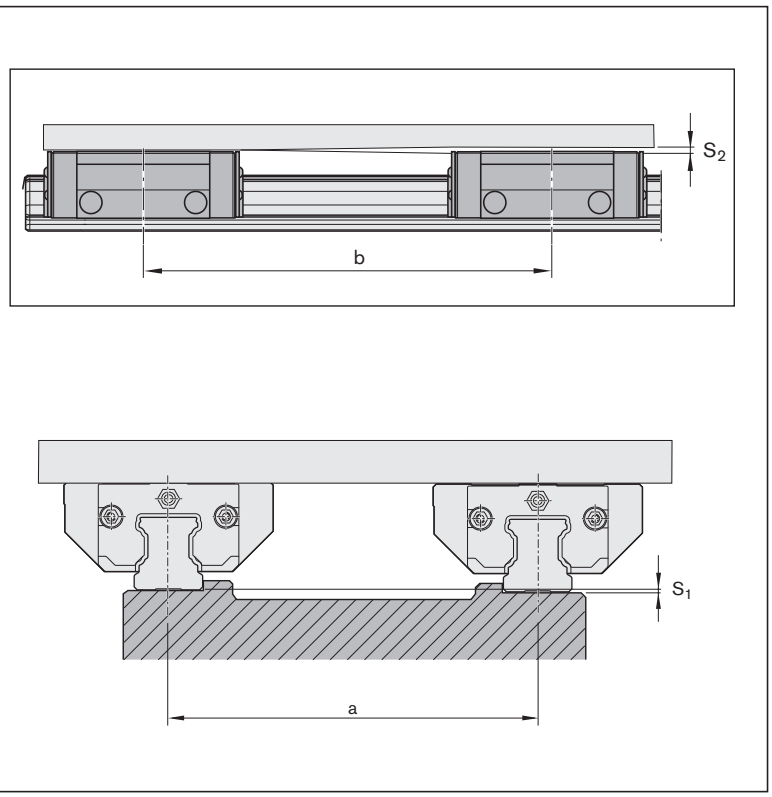


Fig. 19: **Checking the vertical offset of the guide rails**

4.8 Permissible nonlinearity

For super ball runner blocks S, the permissible nonlinearity in longitudinal direction is 10' measured between two successive runner blocks.

☞ Provided the permissible nonlinearity is not exceeded, the influence on the service life will generally be negligible.

4.9 Permissible errors in alignment

For super ball runner blocks S, an error in alignment of 10' on the ball guide rail and on the ball runner block is permissible in both planes.

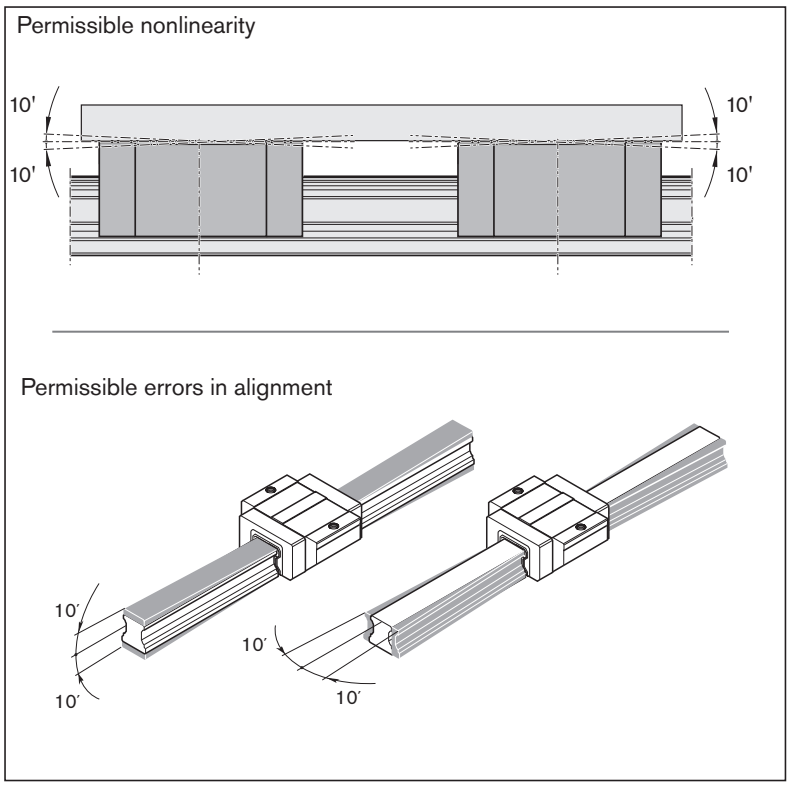


Fig. 20: **Permissible out-of-flatness / permissible alignment errors when using super ball runner blocks S**

EN

4.10 Mounting plastic mounting hole plugs

Tap the plastic mounting hole plugs (1) into place with the aid of a plastic pad (2) until flush with the surface of the rail.

Alternative:
Steel mounting hole plugs ➠ 4.11
Cover strip ➠ 4.12

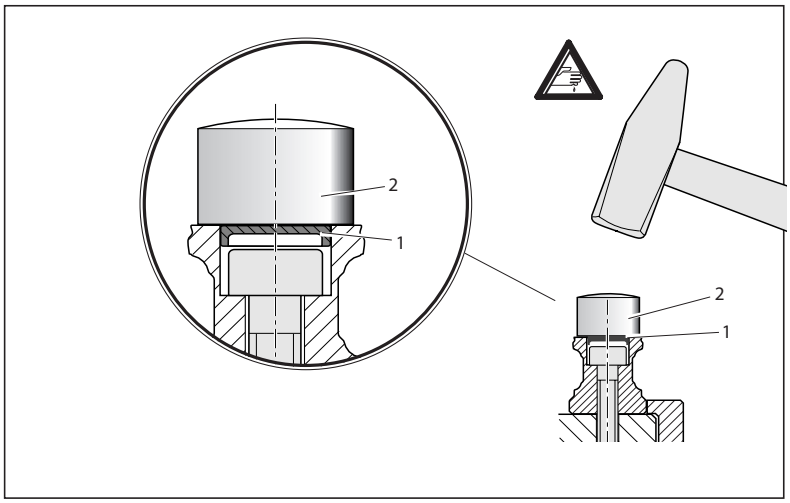


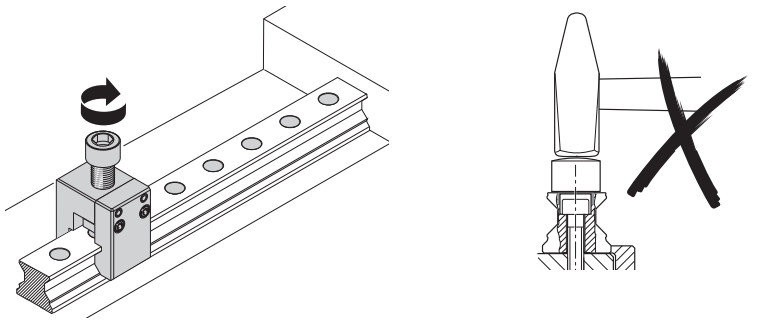
Fig. 21: **Mounting plastic mounting hole plugs**

4.11 Mounting the steel mounting hole plugs

Steel mounting hole plugs must be inserted using a mounting tool! (Do not use a hammer).

For mounting tools see table.(for sizes 15, 20, and 20-40, no steel mounting hole plugs are provided).

1) Can only be delivered as one part.



Size	Mounting tool mat. no.		Mass (kg)	Tightening torque (Nm)
	KSF	RSF		Compression screw
25	R1619 210 00[1)]	R1619 210 20	0.37	approx. 20
30	R1619 710 00[1)]		0.37	approx. 20
35	R1619 310 10	R1619 310 30	0.57	approx. 20
45	R1619 410 10	R1619 410 30	0.85	approx. 35
55	R1619 510 10	R1619 510 30	1.50	approx. 55
65	R1619 610 00[1)]	R1619 610 30	1.85	approx. 75
25/70	R1619 210 40		0.75	approx. 20
35/90	R1619 310 40		1.05	approx. 20
100		R1810 251 30	2.80	approx. 105

Fig. 22: **Mounting tool for mounting hole plugs**

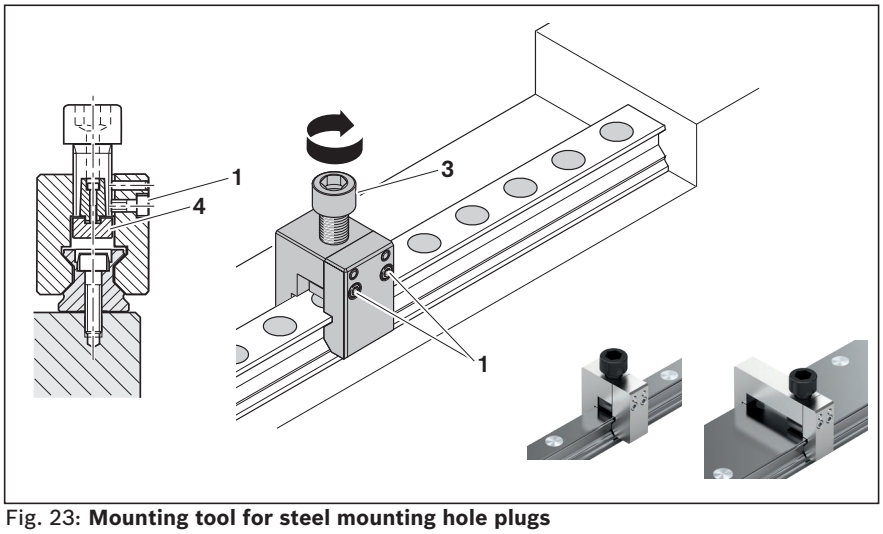


Fig. 23: **Mounting tool for steel mounting hole plugs**

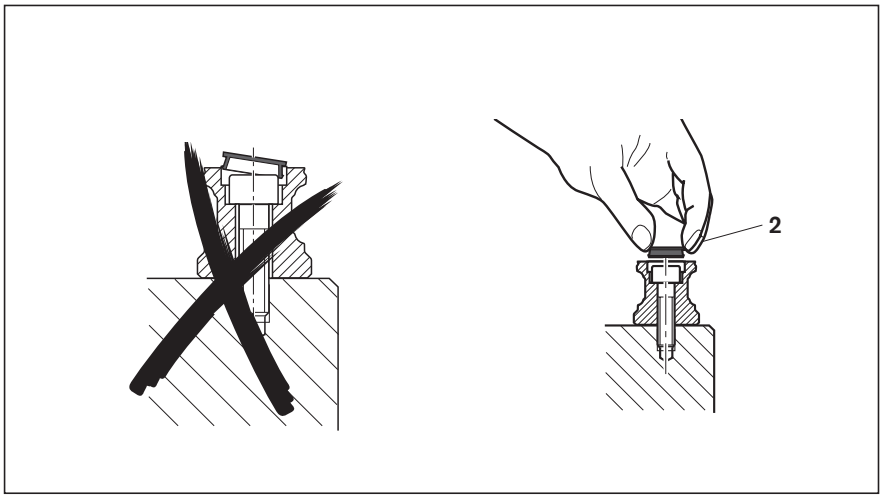


Fig. 24: **Mounting the steel mounting hole plugs**

4.11.1 Fitting the mounting tool

If the mounting tool cannot be slid onto one end of the guide rail:

1. Loosen the screws (1) only as far as necessary to allow the mounting tool to be fitted over the guide rail.
2. Pull the mounting tool apart.
3. Fit the mounting tool around the guide rail.
4. Retighten the screws (1).

4.11.2 Mounting the mounting hole plugs

1. Insert the mounting hole plugs (2) so that they lie flat.
2. Position the mounting tool centrally over the mounting hole plug.
3. Screw in the compression screw (3) until the pressure plate (4) of the mounting tool lies flat against the guide rail.
4. Loosen the compression screw and slide the mounting tool until it is positioned centrally over the next mounting hole plug.

4.11.3 Completing mounting of steel mounting hole plugs

⚠ CAUTION

Risk of injury due to sharp edges.

Risk of minor injuries.

- Wear gloves

1. Remove mounting tool.
2. If there is any slight positive or negative height offset between the mounting hole plugs and the guide rail, smooth the edges using suitable means, e.g. a sanding pad.
3. Using a ruler, check for any height differences between the mounting hole plugs and the guide rail. At points (1) and (2), each mounting hole plug must be flush with the guide rail.
4. Clean the guide rails.

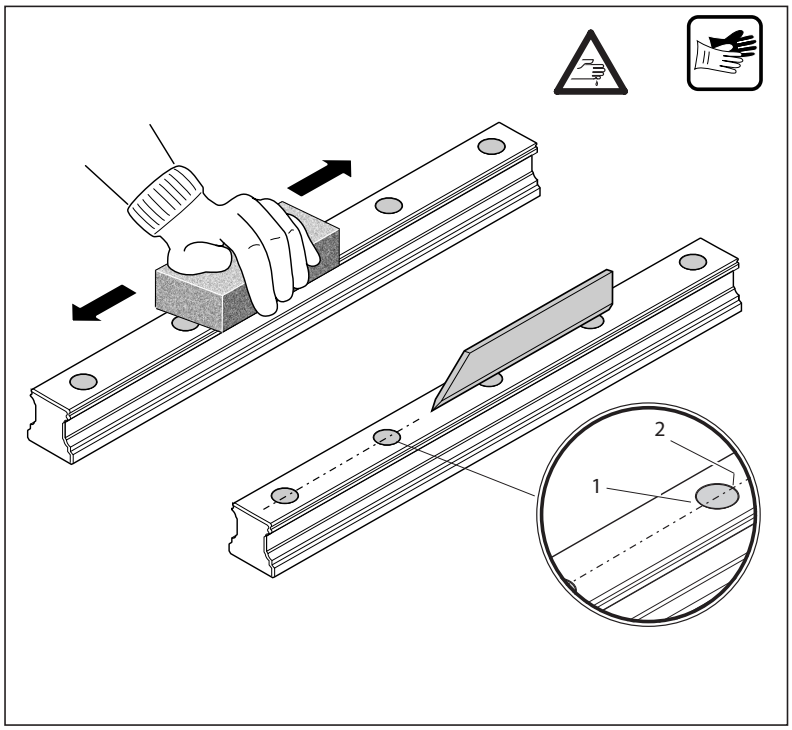


Fig. 25: **Completing mounting of steel mounting hole plugs**

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4.12 Cover strip for BSHP, RSHP

4.12.1 General Information

Advantages of the Rail Seal cover strip
The Rail Seal is easy to clip on and remove.

This considerably facilitates and speeds up the mounting process:

- No need to plug every 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.

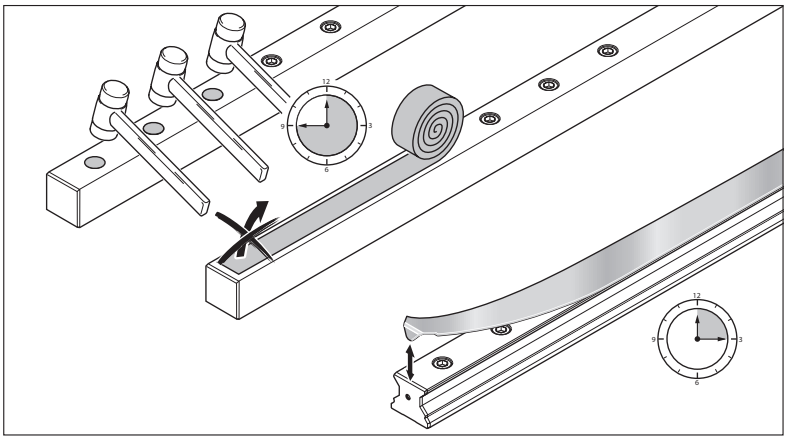

Fig. 26: **Advantages of the Rail Seal cover strip**

Versions/Functions

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 super-structure 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.

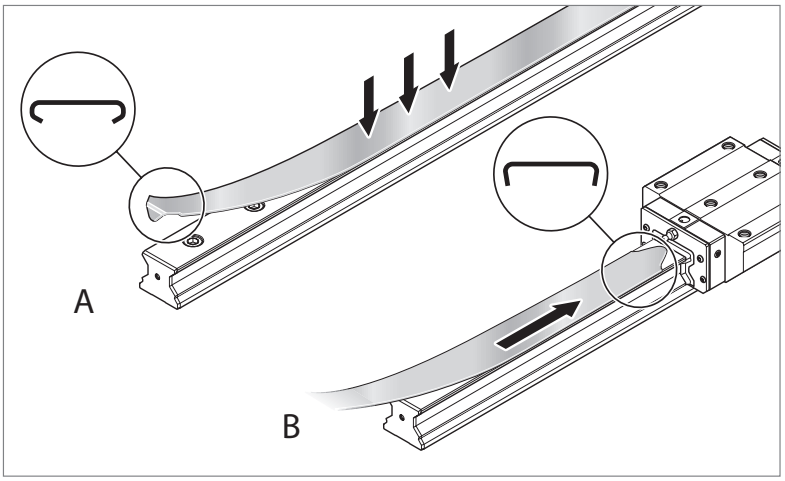

Fig. 27: **Snap-fit/sliding Rail Seal**

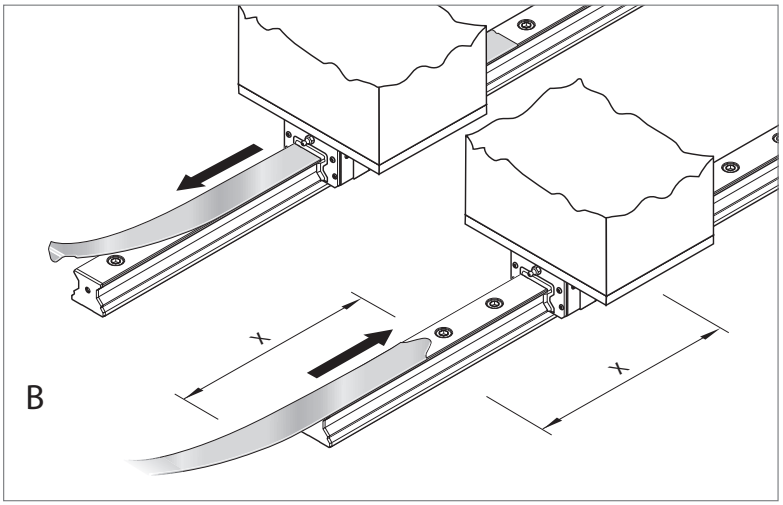

Fig. 28: **Sliding-fit Rail Seal**

An arbor (available as an option) for Rail Seals can be used to create a sliding fit after installation.

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

For mounting of sliding-fit Rail Seals see chapter 4.13.6

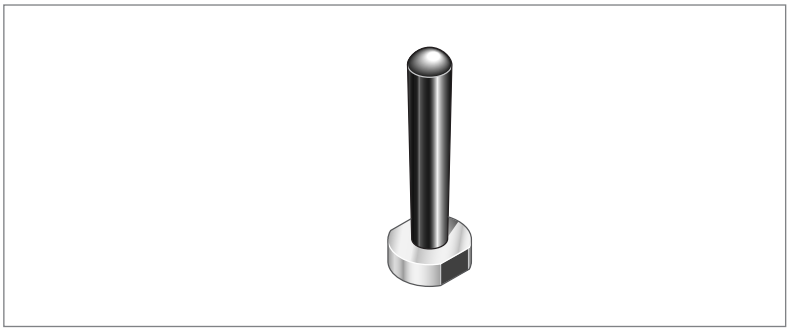

Fig. 29: **Arbor for Rail Seals**

4.12.2 Delivery

Guide rails with pre-mounted cover strip (Rail Seal)

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

For composite guide rails:
A Rail Seal (to cover the total length) and protective caps are 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.

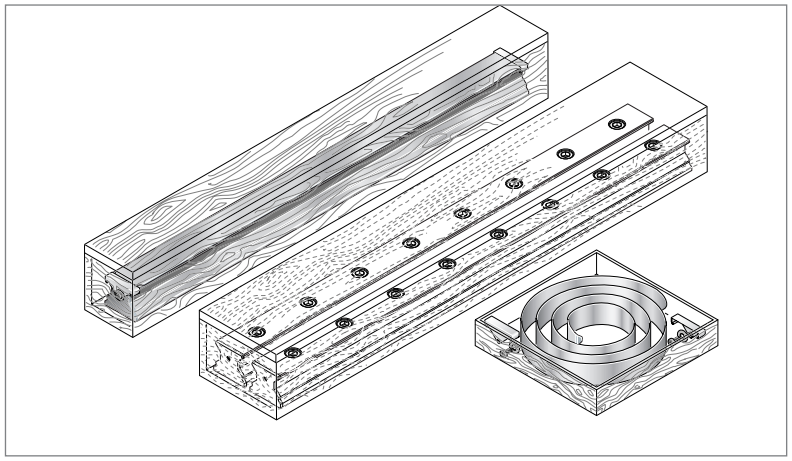

Fig. 30: **Delivery of guide rails with cover strip**

R1619- without cover strip (for storage /replacement)
See relevant catalog for deliverable lengths.

Principle:

A suitable Rail Seal can be delivered for every guide rail length in accordance with the length matrix.

- ▶ If short guide rails are used, the Rail Seal will have to be shortened to suit.
- ▶ Observe the overhang L_V! ➠Fig. 38

Delivery:

- Short Rail Seals: unrolled in oblong packaging.
- Long Rail Seals are rolled in boxes.
- Protective caps are available as an option.

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

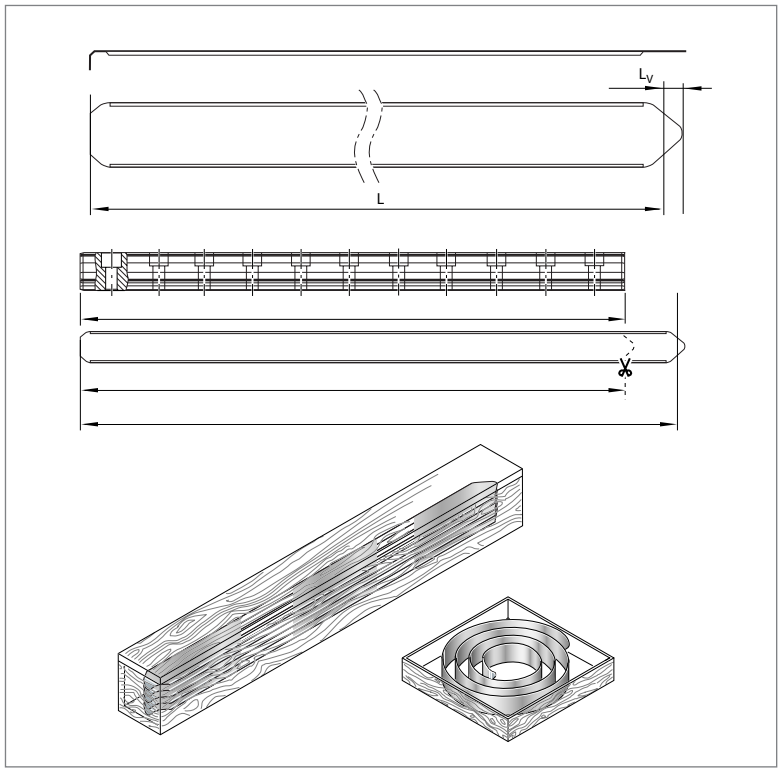

Fig. 31: **Rail Seal for storage**

Protective caps
Use protective caps to protect the Rail Seal.

Protective caps can:

- Prevent injury
- Prevent accidental lifting of the Rail Seal and infiltration of dirt
- Fix Rail Seal.

Mounting the protective caps ➠ 4.13.7

If it is not possible to mount protective caps, secure the Rail Seal via other means. ➠ 4.13.7

See relevant catalog for protective cap part numbers.

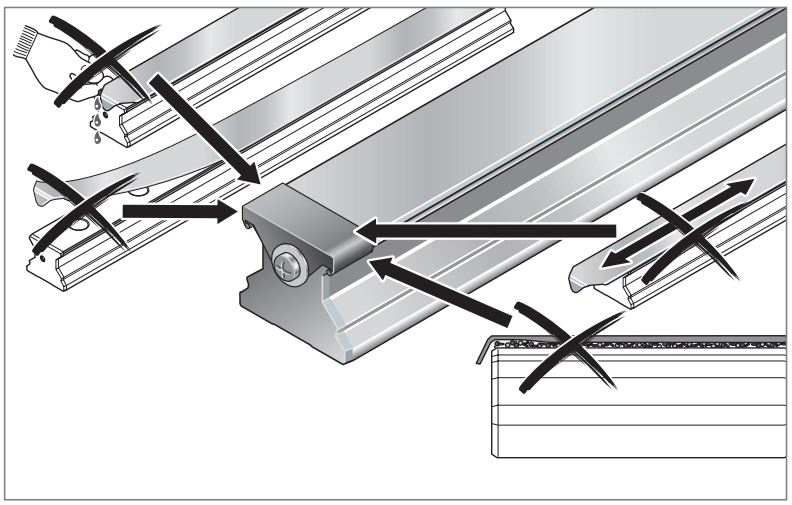

Fig. 32: **Protective caps for guide rails**

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4.13 Mounting Rail Seal

4.13.1 Basic preparations

⚠ Clean all the mounting surfaces and the workplace thoroughly before mounting!

4.13.2 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!
Bent Rail Seals must not be used!

☞ 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 damage to the Rail Seal will shorten its service life!

☞ The Rail Seal can be protected by the following:

- Transport packaging
- Cable duct
- etc.

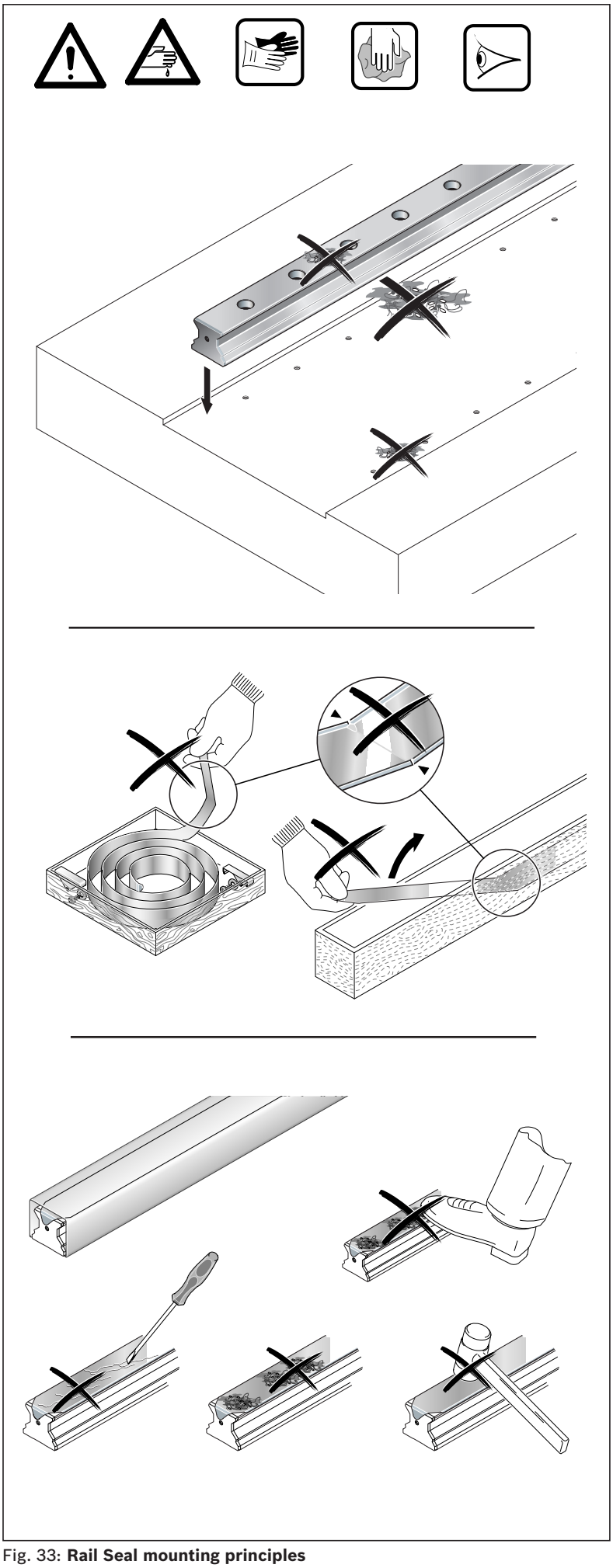

Fig. 33: **Rail Seal mounting principles**

4.13.3 Mounting enclosed Rail Seals

Observe section 4.12. 2

Preparations for mounting one-piece rails:

- First carefully remove the guide rail with the Rail Seal from its packing crate.
- Use a suitable tool to cut through the wrapping paper. The guide rail must not be damaged by blades or similar in the process.
- The Rail Seal is modified exactly to fit the length of the guide rails.
  Please take care always to remount a removed Rail Seal on the matching guide rail.
- Before installing the rail, carefully peel off the Rail Seal from one end to the other.
  Use the lift-off plate for 0.3 mm Rail Seals!

⚠ Risk of injury at the edges and ends of the Rail Seal! Wear gloves!

⚠ 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.

Size	Part number Mounting arbor + lift-off plate	
	KSF	RSF
25	R1619 210 80	R1619 210 40
30	R1619 710 80	R1619 710 50
35	R1619 310 60	R1619 310 50
45	R1619 410 60	R1619 410 50
55	R1619 510 60	R1619 510 50
65	R1619 610 60	R1619 610 50

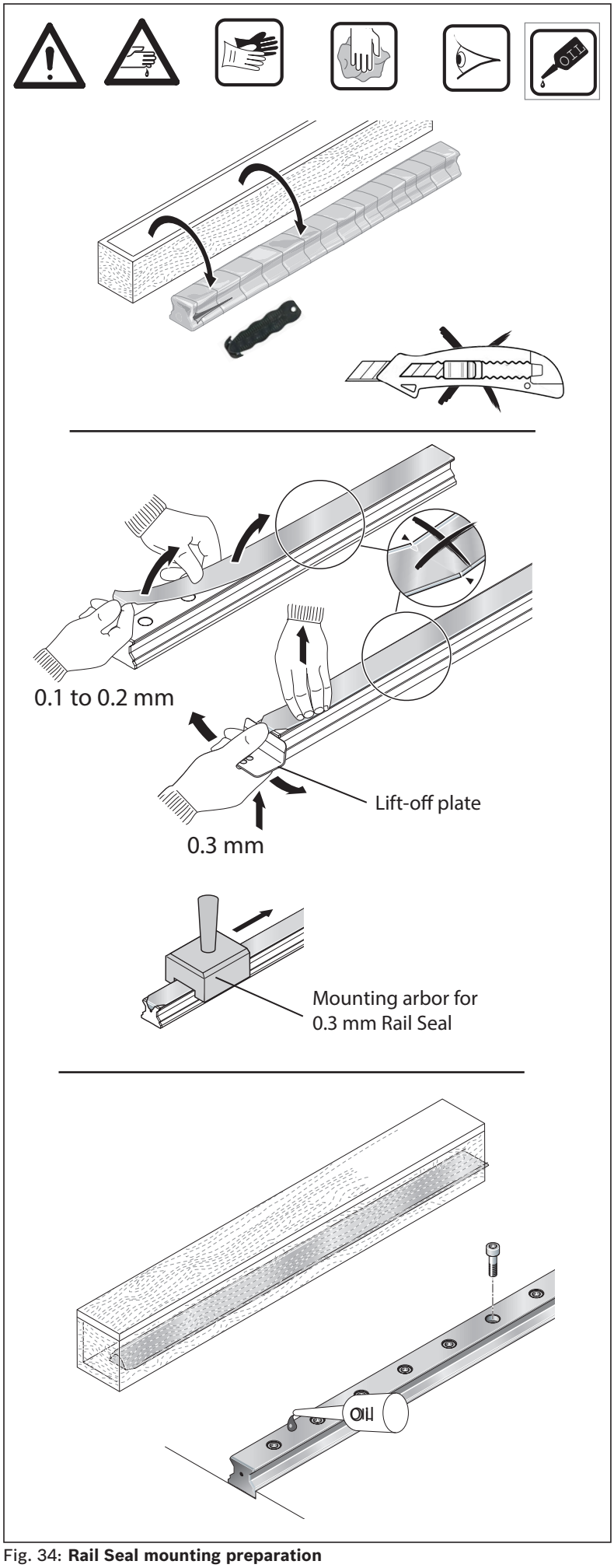

Fig. 34: **Rail Seal mounting preparation**

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The following applies to all Rail Seals:

⚠ Check each Rail Seal prior to mounting! Bent Rail Seals must not be used! When mounting the Rail Seal, start at the end of the rail where the runner blocks are 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.

Rail Seal 0.1 to 0.2 mm:

- 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 mounting arbor!

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

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

- 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

- 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 shape the tongue flush round the rail end.
  Do not cut the tongue off!
- If necessary, shorten the end of the seal just enough to expose the tapped hole on the rail end face ➠ Fig. 35

Before runner block mounting:

- Keep Rail Seal covered! ➠ 4.13.2

After runner block mounting:

- Fit protective caps! ➠ 4.13.17

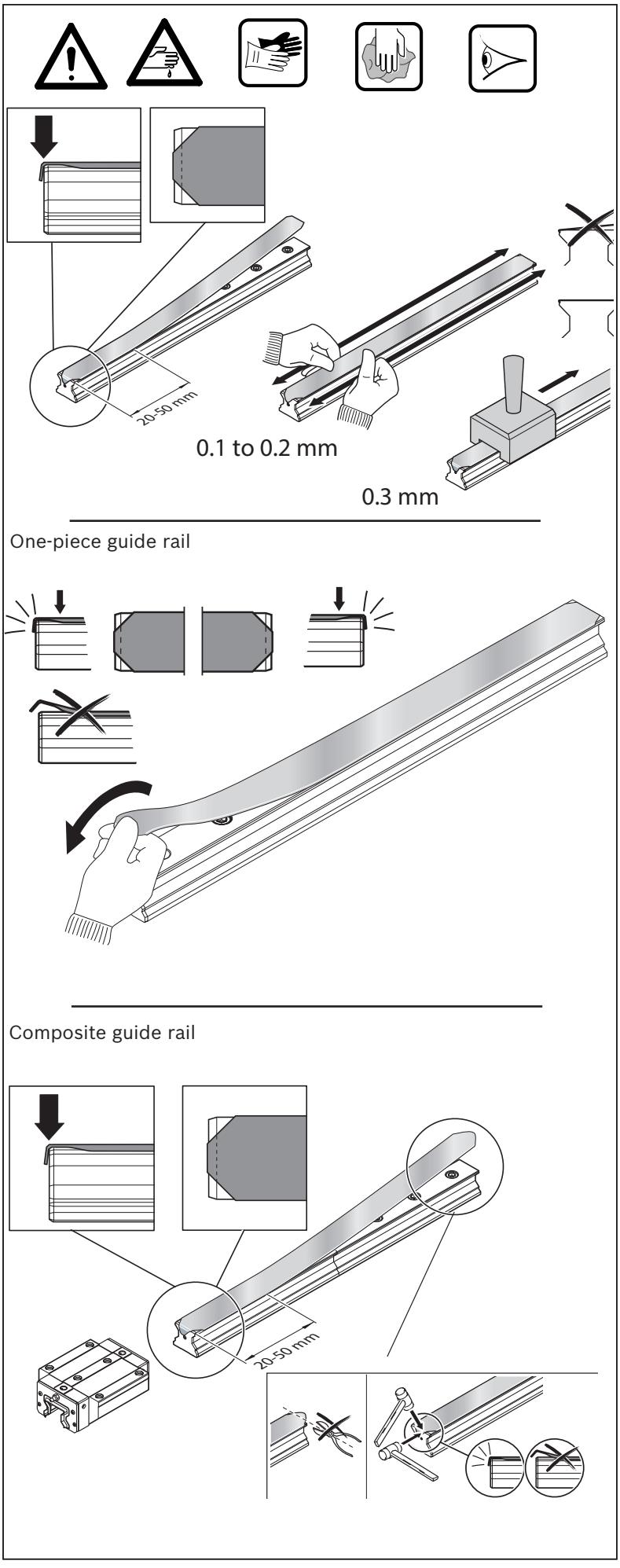

Fig. 35: **Mounting Rail Seal**

4.13.4 Mounting loose snap-fit Rail Seals

Observe section 4.12.1 A and 4.12.2

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 removed and recycled.

⚠ Risk of injury at the edges and ends of the Rail Seal! Wear gloves!

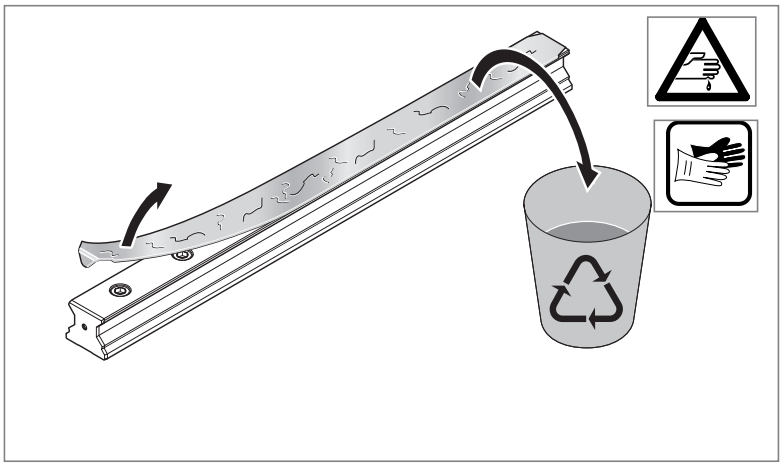

Fig. 36: **Mounting loose Rail Seals**

For custom-length Rail Seals:
☛ Rail Seals can be delivered already cut to the right length.
One end tongue is angled down, the other straight.

Before mounting:

⚠ ➠ Fig. 37

⚠ 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.
- ▶ Use a plastic mallet to shape the tongue flush round the rail end. Do not cut the tongue off! ➠ Fig. 37
- ▶ If necessary, shorten the end of the seal just enough to expose the tapped hole on the rail end face.

⚠ The Rail Seal must fit snugly around the end of the guide rail! ➠ Fig. 37
No burrs permissible!
If necessary, correct the fit.

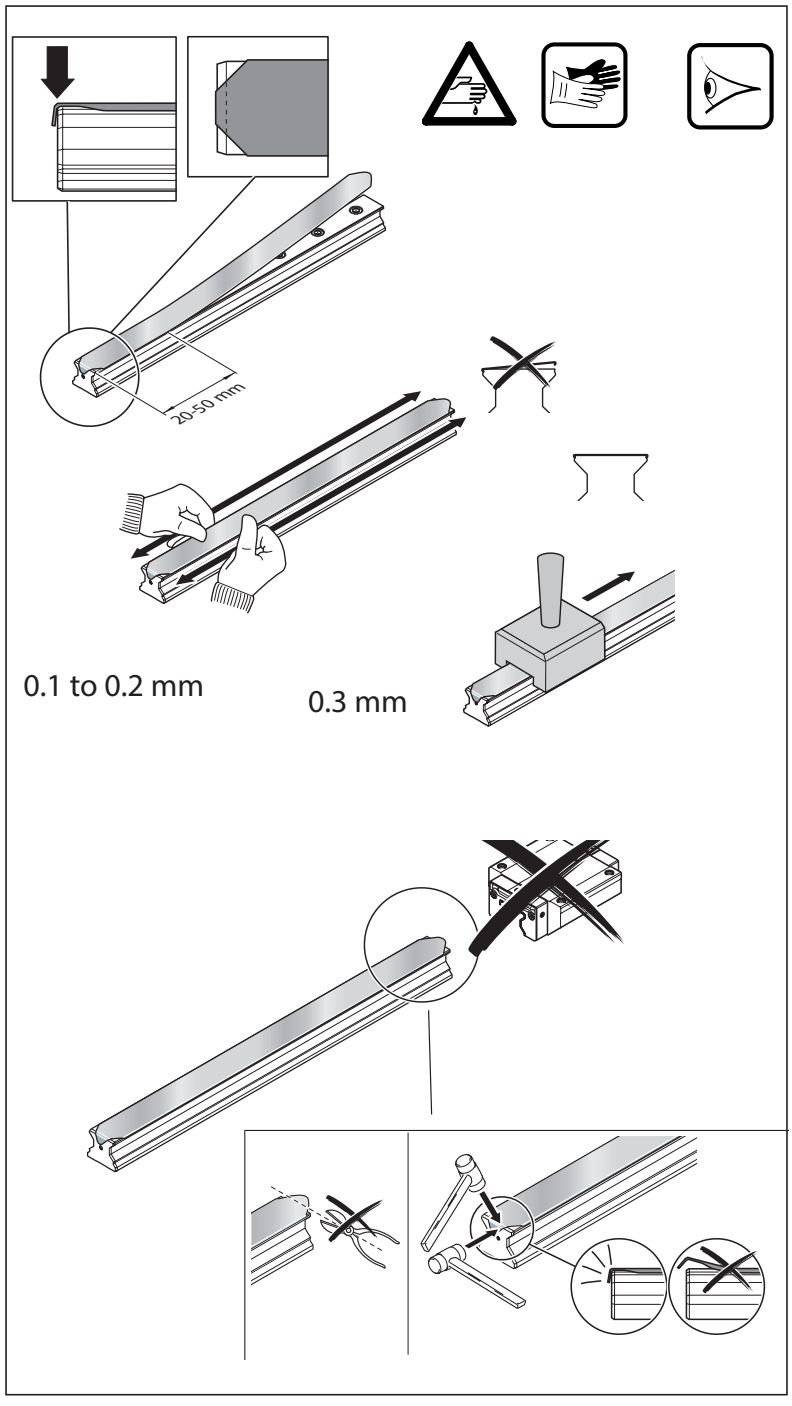

Fig. 37: **Mounting custom-length Rail Seals**

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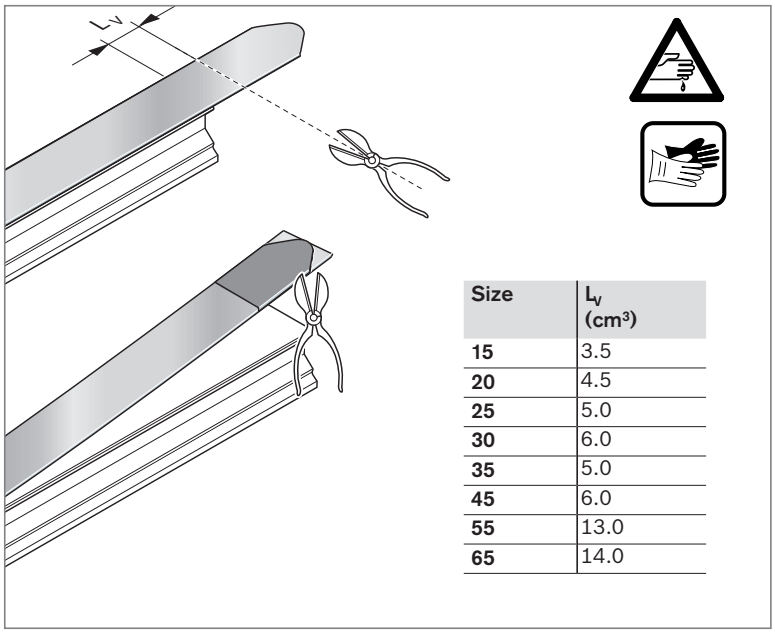
If the Rail Seal is not the right length:

- Mount the Rail Seal, starting at the end with the angled-off tongue.
  ➠ Fig. 37
- 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!

⚠ Risk of injury at the edges and ends of the Rail Seal! Wear gloves!

⚠ Do not bend or scratch the Rail Seal!



Size	L_v (cm^3)
15	3.5
20	4.5
25	5.0
30	6.0
35	5.0
45	6.0
55	13.0
65	14.0

Fig. 38: **Mounting Rail Seals if the Rail Seal is not the right length**

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

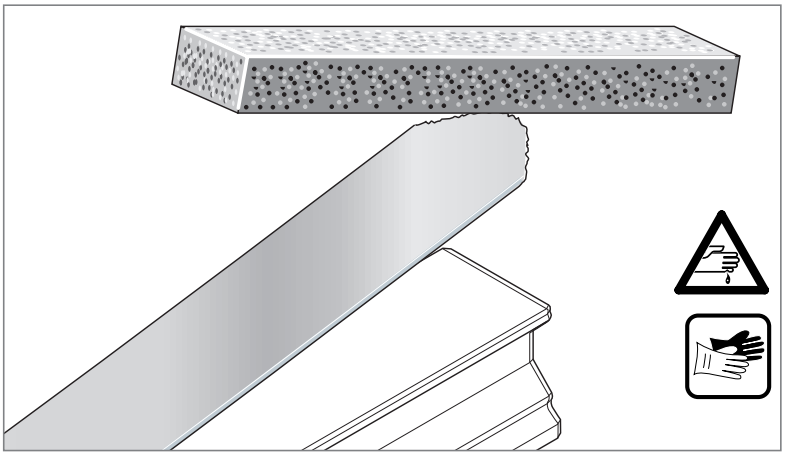


Fig. 39: **Deburring the cut edges of the Rail Seals**

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

⚠ The Rail Seal must fit snugly around the end of the guide rail! No burrs permissible! If necessary, correct the fit ➠ Fig. 37.

⚠ Do not slide runner blocks on over the cut end of the Rail Seal!
Slide runner blocks on at the preformed and preshaped end! ➠ 5.2

Fit protective caps ➠ 4.13.17

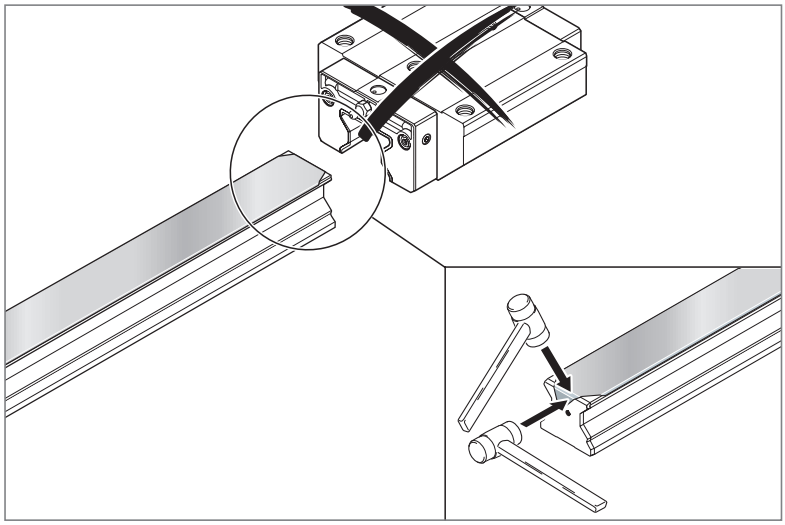


Fig. 40: **Completing mounting of Rail Seals**

4.13.5 Removing the snap fit Rail Seal

(With pre-mounted superstructure)

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 and store them. They are reusable!
- Lift 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, lift the Rail Seal off the rail and use pliers to pull it out from under the runner block.

⚠ The Rail Seal is now unusable! Take it to recycling!

For guide rails of approx. 1000 mm and longer:

- First remove the protective caps and store them. They are reusable!
- Pull the runner block with its superstructure to a distance of at least L +500 mm from one end of the rail.
- Lift the Rail Seal at this end.

⚠ Do not bend the Rail Seal!

- Cut off the tongue. ➠ Fig. 41

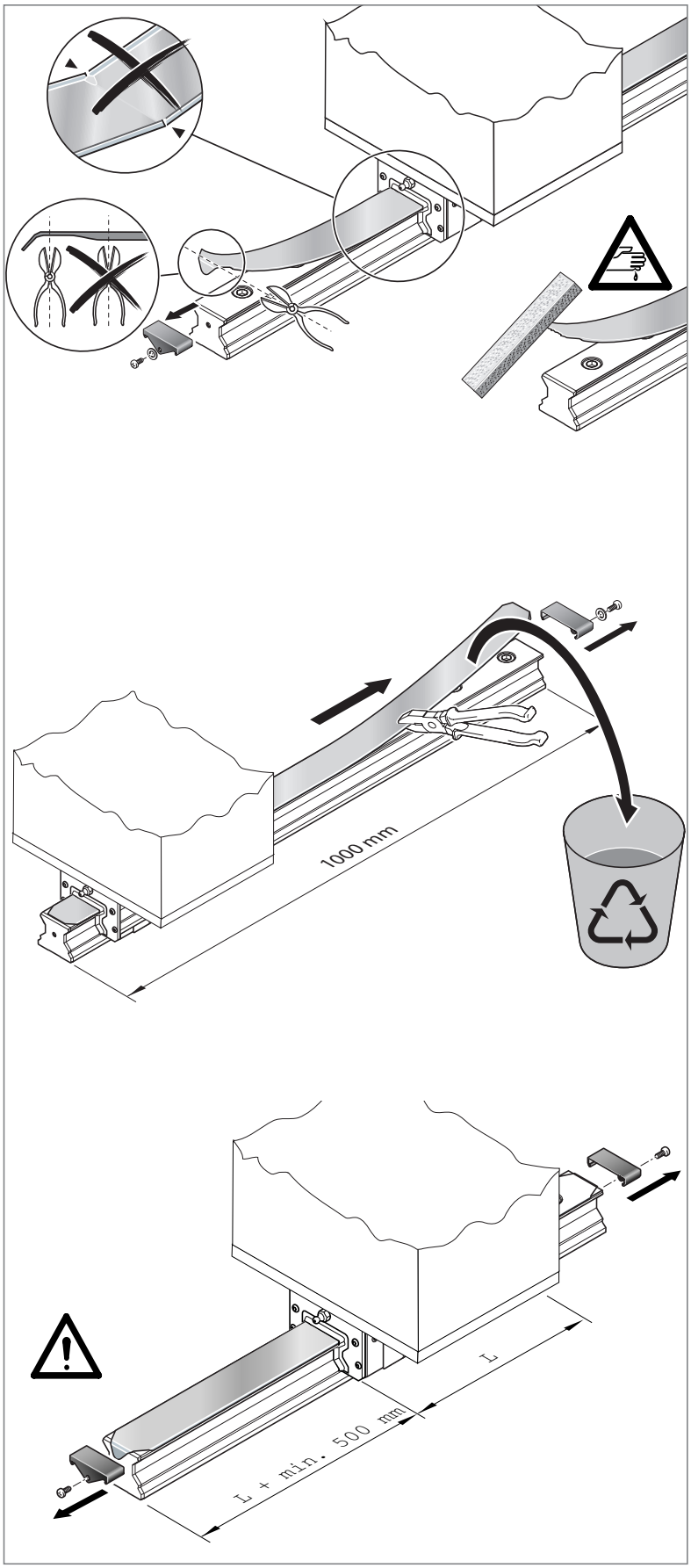


Fig. 41: **Removing the snap-fit Rail Seal**

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- 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.

⚠ Do not bend the Rail Seal!

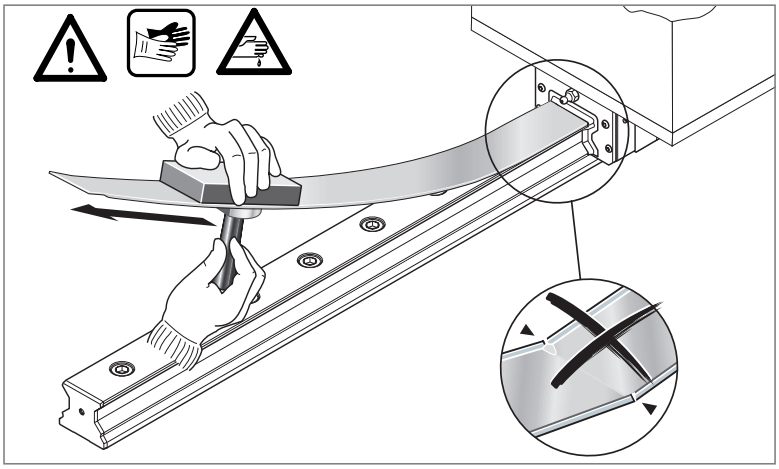


Fig. 42: **Widening the Rail Seal**

- Clip the widened sliding section of the Rail Seal completely back onto the rail.
- Push the runner block with its superstructure back onto the sliding section.

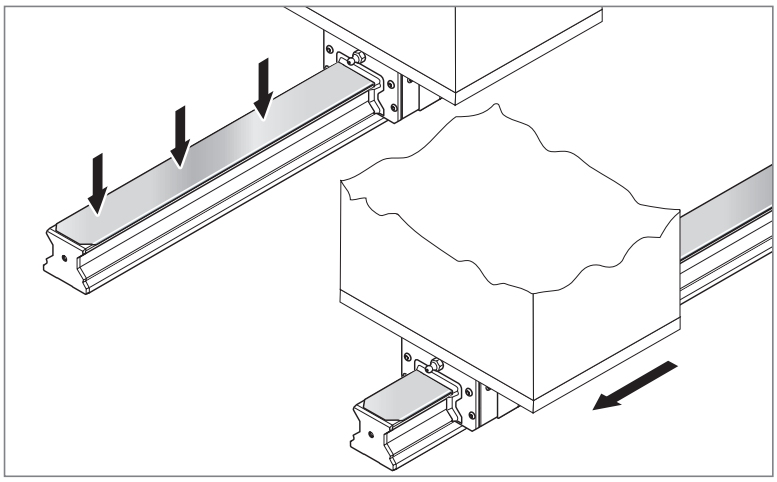


Fig. 43: **Clip on Rail Seal/push runner block back into the widened sliding section**

- Use pliers to ease the Rail Seal off the other end of the rail and pull it out from under the runner block.

⚠ The Rail Seal is now unusable! Take it to recycling!

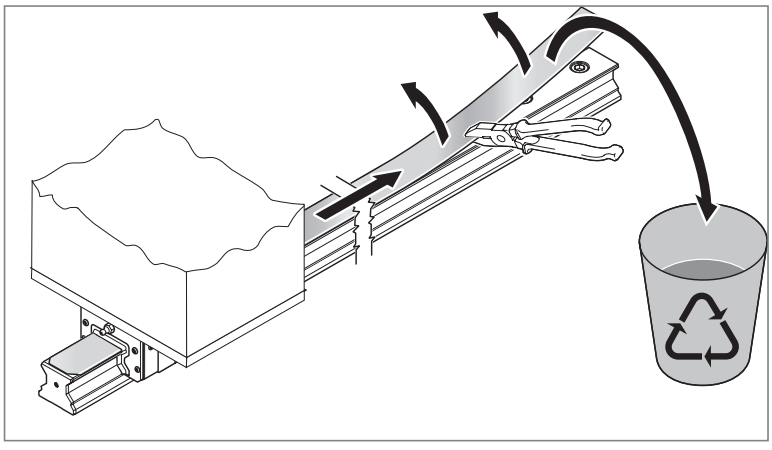


Fig. 44: **Pulling out the Rail Seal**

4.13.6 Mounting the sliding-fit Rail Seals

Observe section 4.12.1

Starting point (example):
Damaged seal needs to be exchanged. However, the runner block and its superstructure cannot be removed.

Solution:

A sliding-fit section can be prepared on the Rail Seal for mounting and removal purposes.

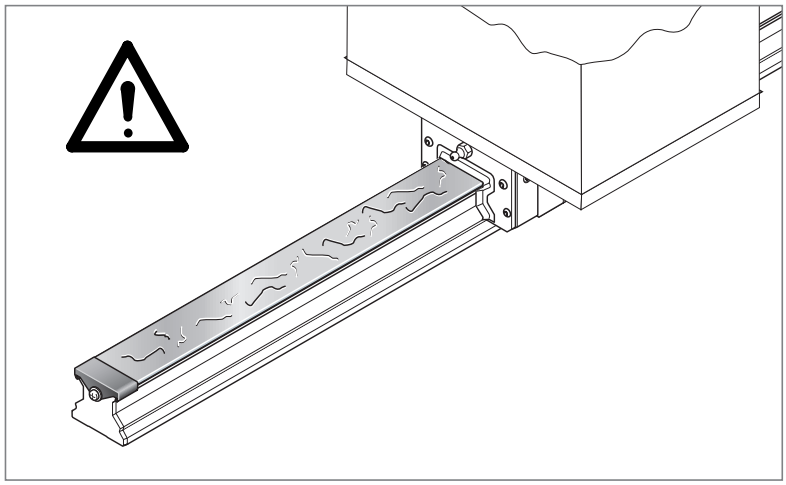
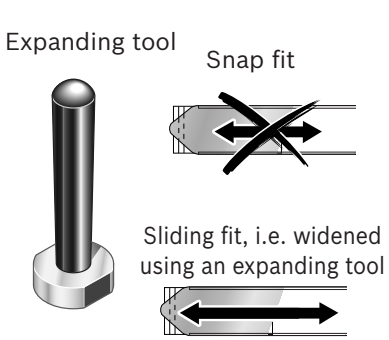


Fig. 45: **Sliding-fit Rail Seal**

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.

⚠ Rail Seals must be fixed in place with protective caps! ➠ 4.13.17



Size	Cover strip	Expanding tool material numbers
15	0.1 mm	R1619 115 10
20	0.2 mm	R1619 815 10
25		R1619 215 10
30		R1619 715 10
35	0.3 mm	R1619 315 30
45		R1619 415 30
55		R1619 515 30
65		R1619 615 30

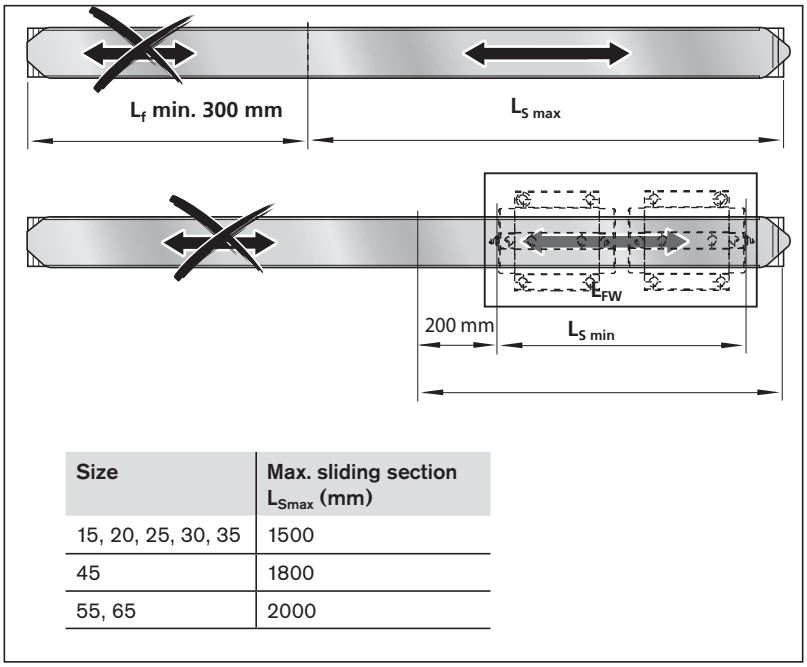
Fig. 46: **Material numbers for expanding tool**

Calculating the length of the sliding fit
The maximum length of the sliding fit L_{Smax} is limited by the manual pushing force. See table opposite.

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

In the smaller sizes up to size 25, the overall length of the superstructure 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!



Size	Max. sliding section L_{Smax} (mm)
15, 20, 25, 30, 35	1500
45	1800
55, 65	2000

Fig. 47: **Calculating the length of the sliding fit**

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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. Hold the Rail Seal down with the other hand.

⚠ Risk of injury at the edges and ends of the Rail Seal! Wear gloves!

For longer sliding-fit sections:
☞ The best solution is for two people to carry out the operation with one person holding down the Rail Seal while the other draws the expanding tool through.

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

⚠ Make sure the supporting surface is flat and clean!

⚠ Risk of injury at the edges and ends of the Rail Seal! Wear gloves! Take care not to let the expanding tool slip! You may cause burrs on the clip-on edges!
There is a risk of damaging seals!

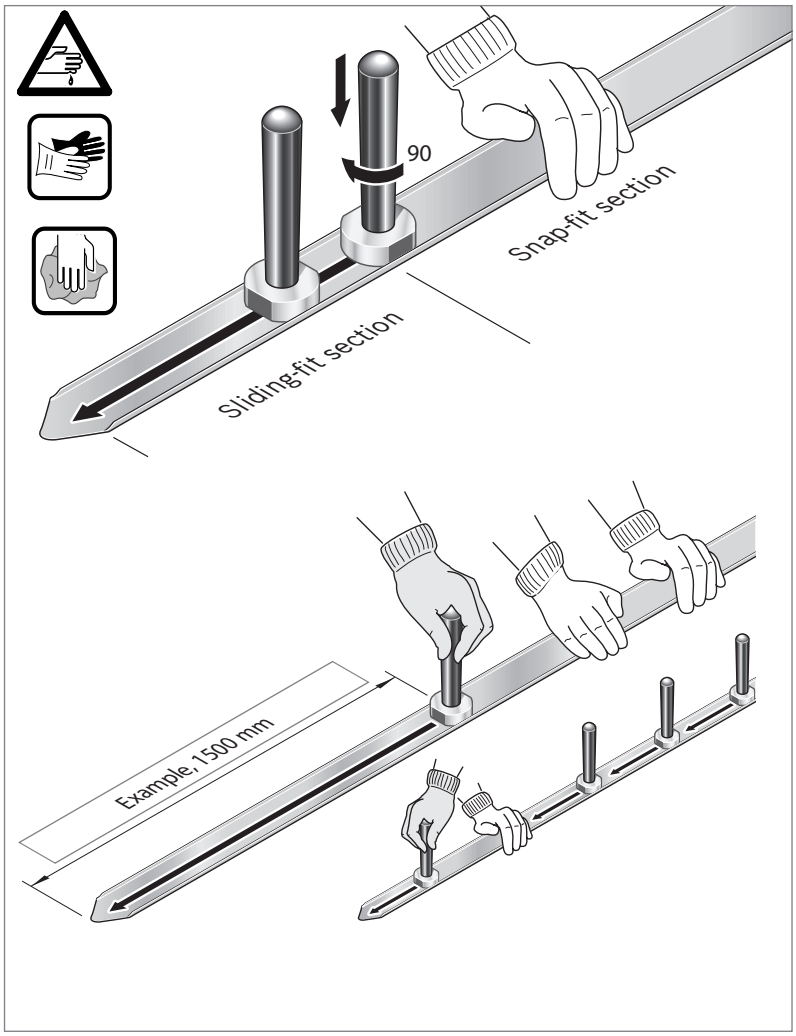


Fig. 48: **Preparing the sliding-fit section**

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 front 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!

⚠ Risk of injury at the edges and ends of the Rail Seal!

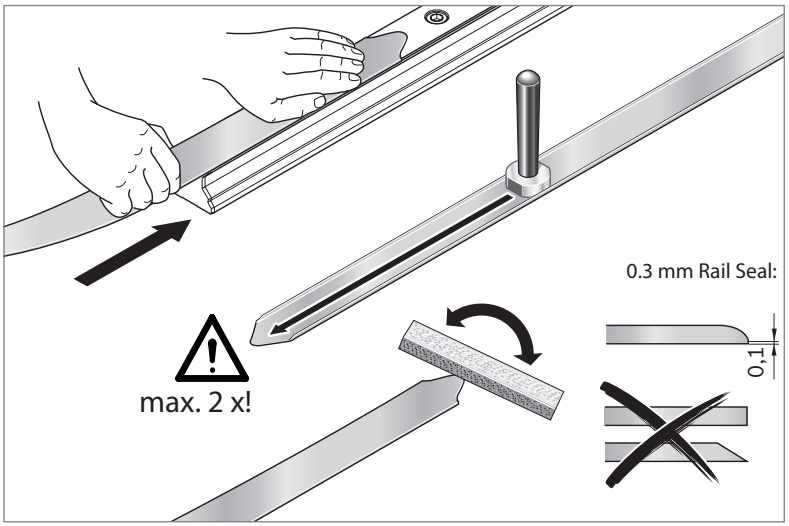


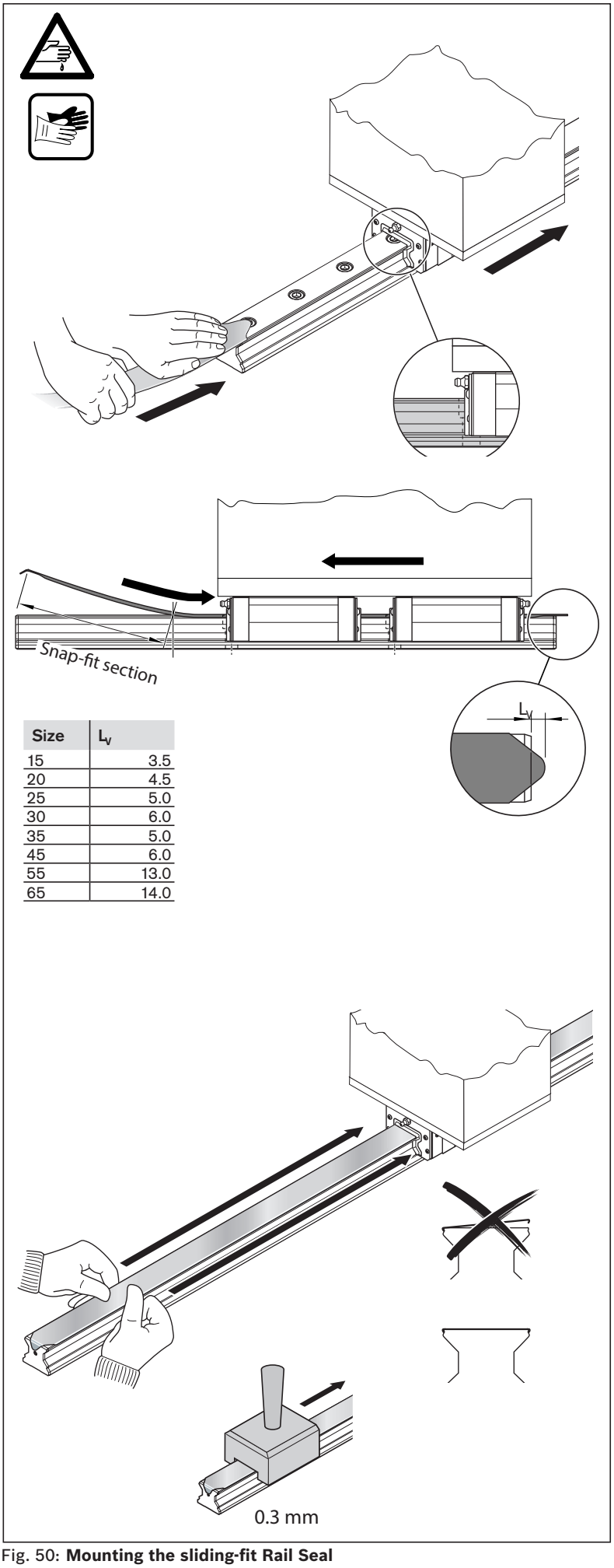
Fig. 49: **Checking the sliding fit**

Mounting the sliding-fit Rail Seal

- Push the runner block with superstructure 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. ➠ Fig. 49
- Push the sliding-fit end of the Rail Seal onto the guide rail, starting at the front 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 superstructure 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!
- 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.
  ➠ Fig. 38.

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

- Angle down the Rail Seal tongue.
  ➠ Fig. 37.
- Fit protective caps.
  ➠ 4.13.17.



Size	L_V
15	3.5
20	4.5
25	5.0
30	6.0
35	5.0
45	6.0
55	13.0
65	14.0

Fig. 50: **Mounting the sliding-fit Rail Seal**

EN

4.13.7 Securing the Rail Seal

- Rail Seals should preferably be secured using a strip clamp (A) or protective caps (B) (1)!

For protective caps threads are provided in the end faces of the guide rails ex works.

If it is not possible to mount protective caps or the strip clamp:

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

Alternatively (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 from above 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.

or (4):

- First proceed as in (3.), then machine an additional 90° countersink, remove drillings, and screw down Rail Seal using a countersunk screw.

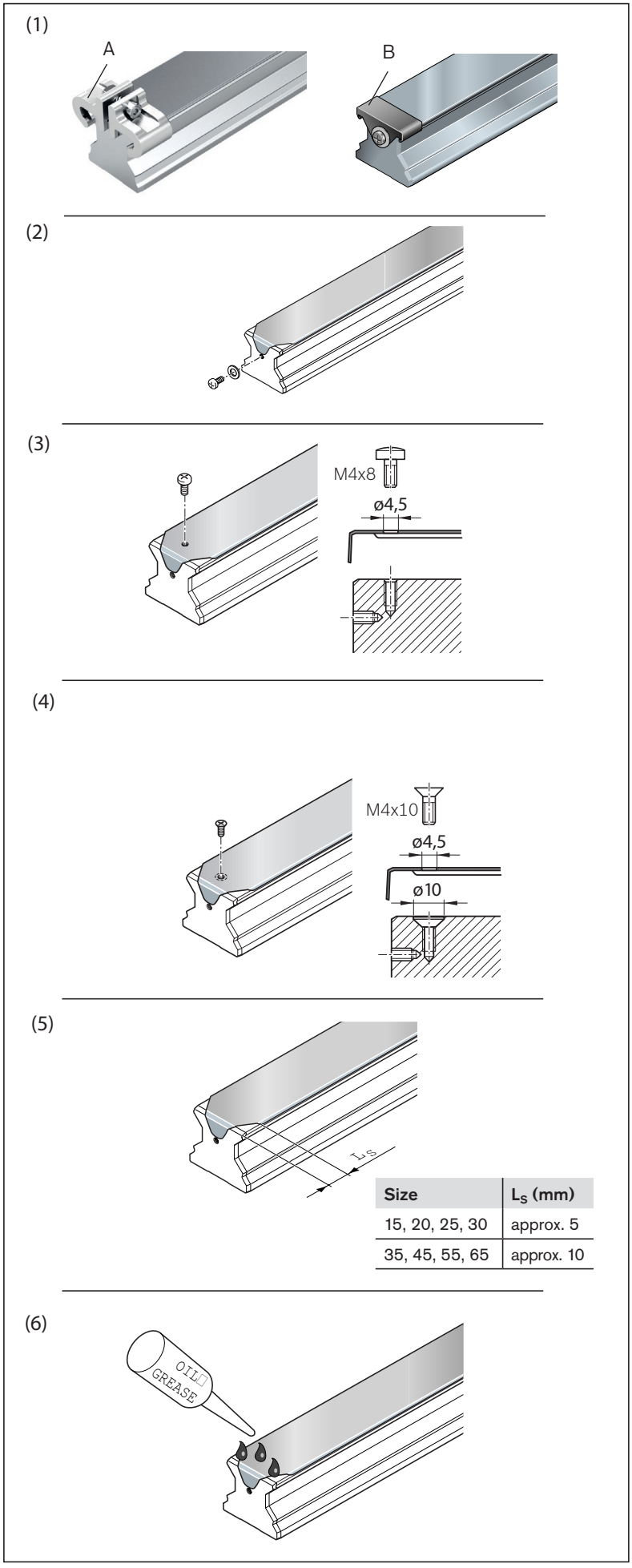
⚠ For all fastenings without protective caps: Seal the end of the seal (bevel cut) with highly viscous oil so that no dirt can infiltrate!

⚠ 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 (6):

- 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.



Size	L_S (mm)
15, 20, 25, 30	approx. 5
35, 45, 55, 65	approx. 10

Fig. 51: **Securing the Rail Seal**

9 Lubrication

See relevant catalog

10 Technical data

See relevant catalog

11 Operating conditions

See relevant catalog

12 Tightening torques

If not specified otherwise here, please refer to the corresponding publications for tightening torques for fastening screws.

13 Disposal

The rail system contains a number of different materials: Aluminum, steel, plastics, grease.

NOTICE

Environmentally hazardous materials can pollute the environment if not disposed of properly!

Environmental pollution.

- Collect any escaping lubricant and dispose of it correctly.
- The rail system must be disposed of correctly and in compliance with all applicable national and international guidelines and regulations.

14 Service and support

Our Customer Service helpdesk staff will be happy to assist you in any way they can.

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E-mail: service.svc@boschrexroth.de