SKF Precision rail guides

The SKF Group

The SKF Group is an international industrial corporation of AB SKF Sweden, founded in 1907, operating in 130 countries. The company has some 45000 employees and more than 80 manufacturing facilities throughout the world.
Its international network is supported up by nearly 20000 distributors and retailers. SKF is the world leader in the rolling bearing business.
Bearings, seals and special steels are SKF's main product areas. In addition, they also manufacture and sell, other industrial precision components and products.

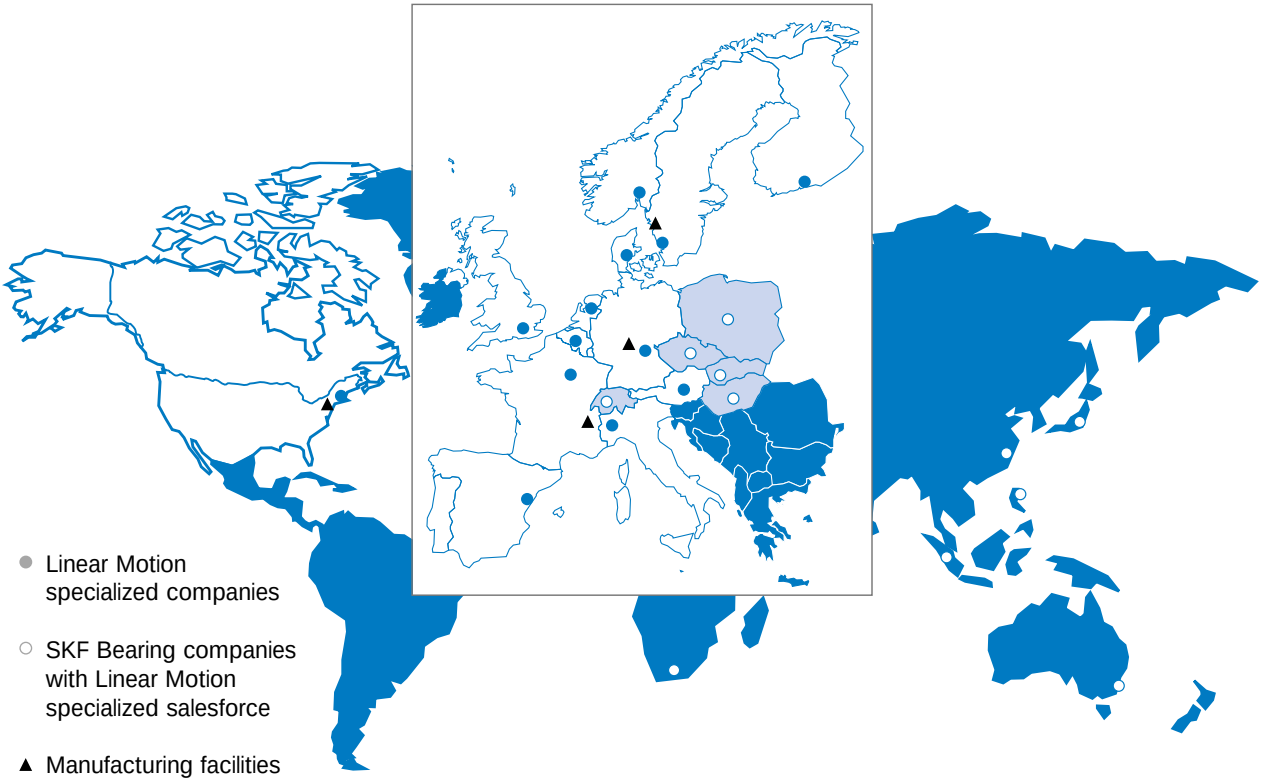
SKF Linear Motion

One of these industrial precision products assortment is manufactured and sold by the SKF Linear Motion Division.
This unit has some 700 employees, 6 manufacturing facilities, 3 product lines. One of the division's strengths is its ability to serve the market through its organization based on 11 specialized Sales Companies located in Europe and North America; however product availability and product application support is provided word-wide by the SKF international network.

The Linear Motion product range covers:
- High Efficiency Screws
- Linear Guiding Systems
- Electromechanical Actuators

CD-ROM "Designer"

All linear Motion products are available in this CD, in DWG and DXF files.
Thanks to "Designer", you can easily copy the drawing of the product you need into your own design drawing. If you are interested, please do not hesitate to contact your local SKF sales organization. It is free of charge.



● Linear Motion specialized companies

○ SKF Bearing companies with Linear Motion specialized salesforce

▲ Manufacturing facilities

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Earlier catalogues the data in which deviate from those given here, are rendered invalid.
The right is reserved to make changes necessitated by technological developments.

Introduction

As world leader in the manufacture of rolling bearings, SKF supplies practically every kind of bearing for rotational and linear motion.

SKF is therefore in a position to meet almost any customer requirement both technically and economically.

This catalogue covers the SKF range of precision rail guides and accessories.

SKF precision rail guides are precision products for linear motion and are therefore ideally suited for use with in wide variety of machine tools, work centres, handling systems, special machinery, measuring and test equipment.

The “Modular range” has introduced a new concept to the market of interchangeability of all the well known guidance systems including the high capacity LWRE type guides. This matrix range of rail guides is suitable for almost every area of application.

SKF precision rail guides are available in many different designs, sizes and standard lengths, incorporating ball, roller or needle roller assemblies and plain bearings. Suitable accessories are also available for attachment and sealing.

The use of SKF precision rail guides facilitates the construction of economical, clearance-free linear guides of practically any type and length, according of the building block principle. The characteristics of the guides include:

- a constant, high degree of running accuracy
- low-friction stick-slip-free operation
- high speed of travel
- low heat generation
- low friction and high reliability
- high stiffness
- excellent load carrying capacity

For applications where high accelerations occur or where strokes are short and of high frequency, SKF rail guides with dry sliding liners are recommended.

These guides are also suitable for machine tool applications where the good damping properties of these plain bearing guides is of greater importance than the lower friction of the rolling element rail guides. For those applications where rail guides, for instance because of their limited travel are unsuitable, SKF can supply alternative forms of linear guidance systems. If you would like further details, please contact SKF for technical advice. We will be pleased to provide the required information without obligation and at no cost, or to prepare a technical proposal.

This catalogue brings together all the basic data which we consider to be of interest. For additional information we recommend the SKF Technical Handbook, No. 4185 on Linear guidance systems which contains sections on the selection, application, operational life, mounting and maintenance of SKF precision rail guides. For further specialised advice please contact your nearest SKF sales office.

All data in this catalogue is based on 1992 design and manufacturing standards.

Earlier publications, the data in which deviates from that given here, are rendered invalid.

We reserve the right to make any necessary technical changes to the information contained herein.

In this catalogue the units used are in accordance with the international SI system. Conditions of delivery and payment are generally based on those ruling at the time of delivery.

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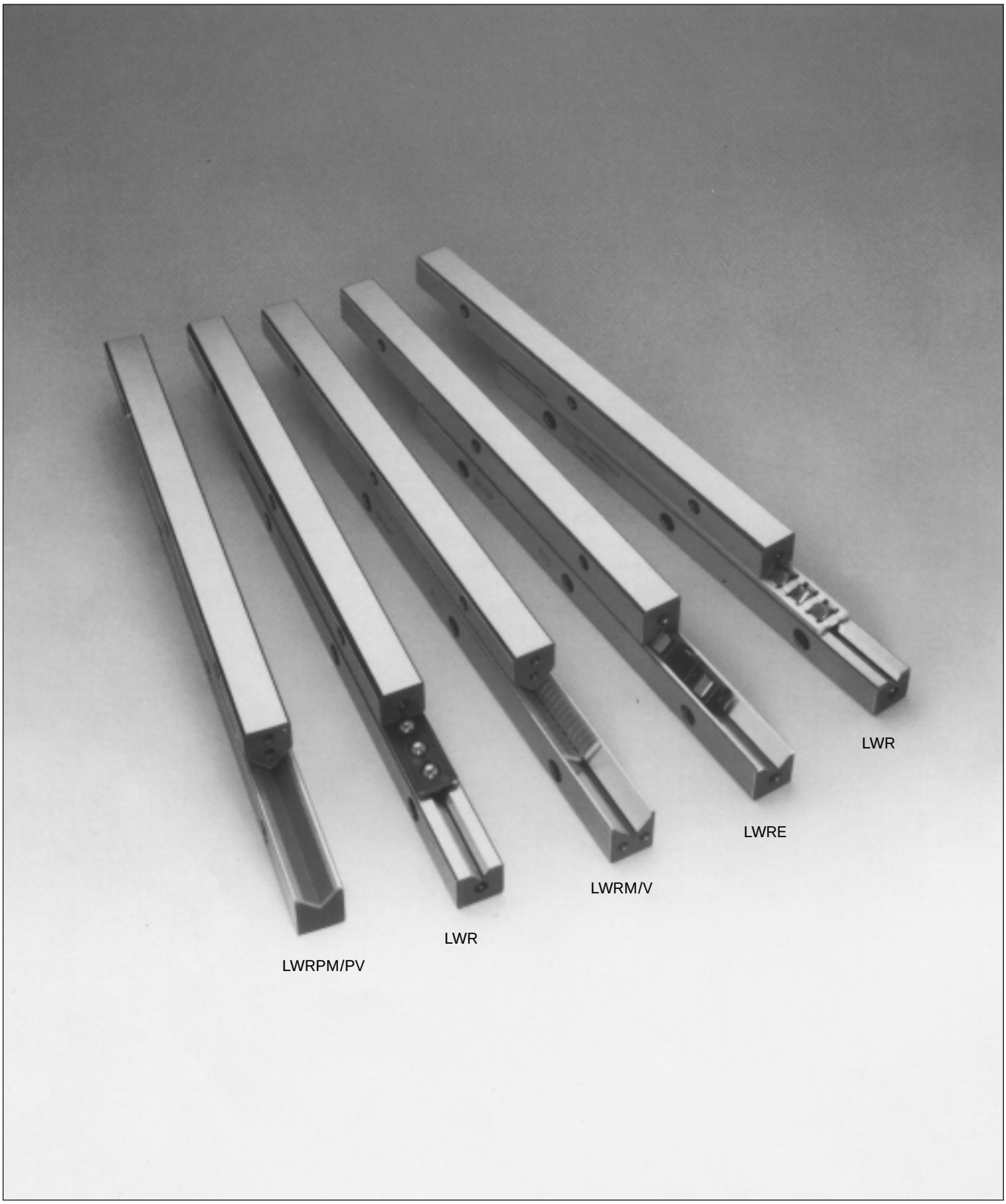
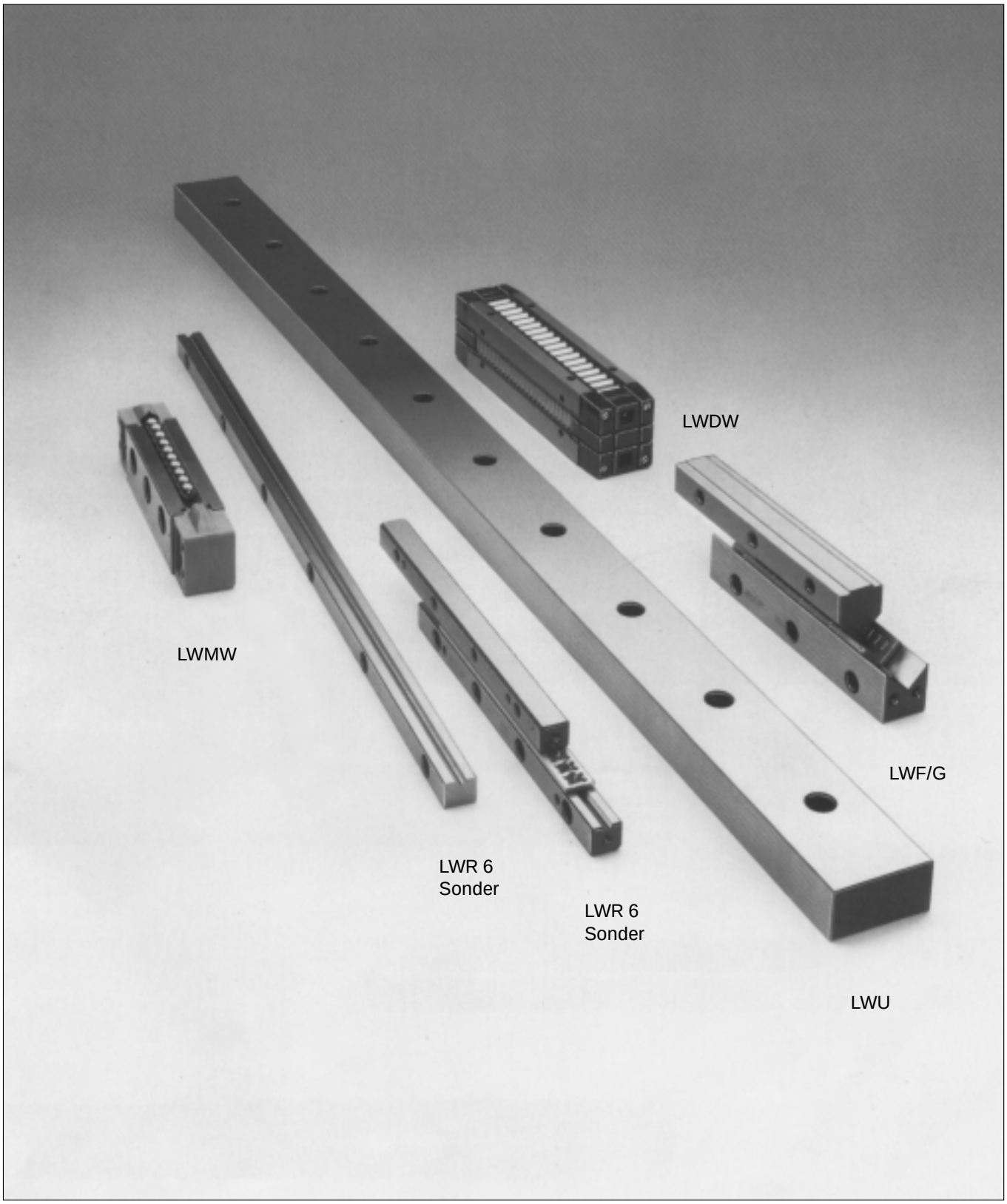


Product review

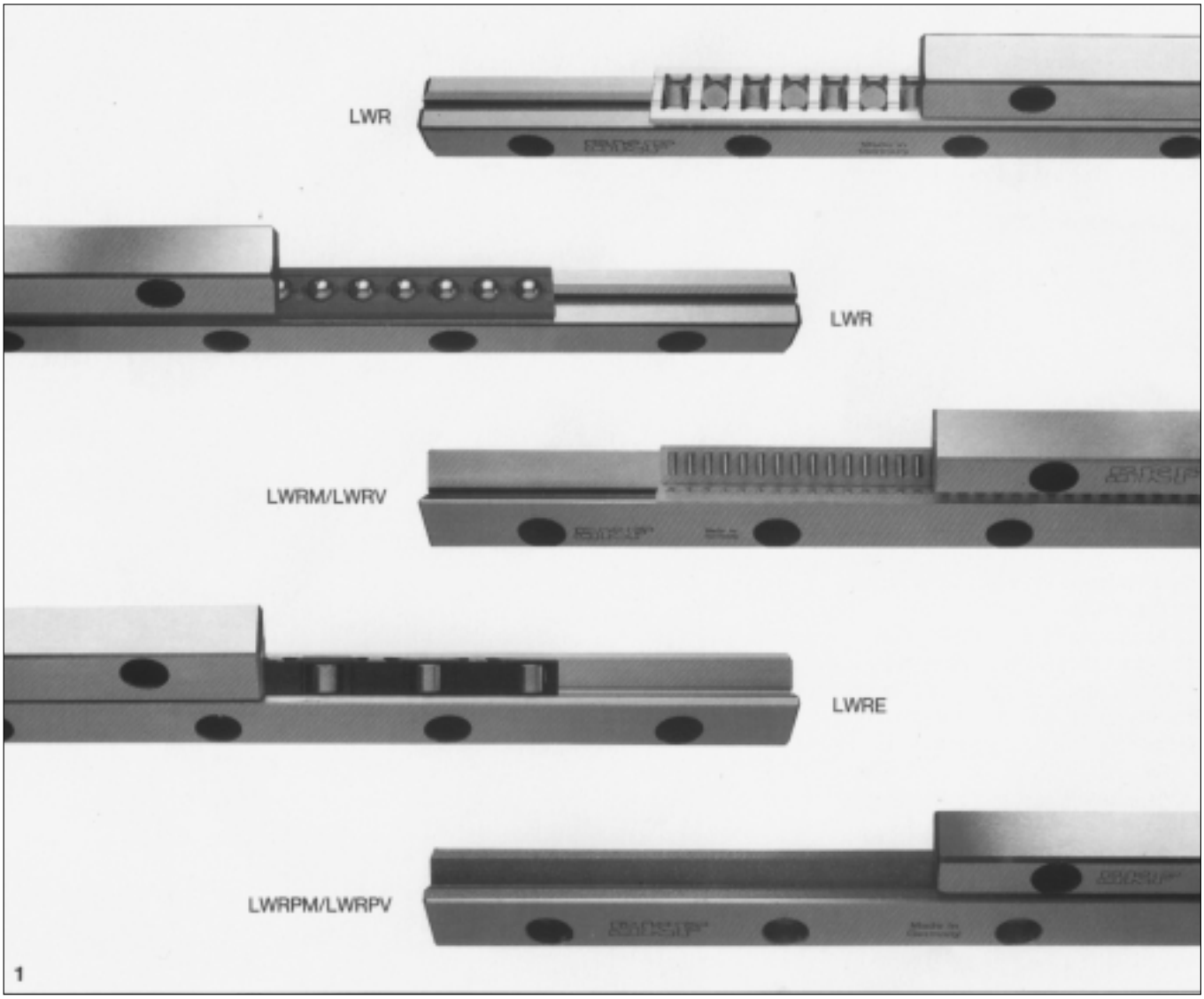
Other products



Product range

SKF Modular Range rail guides
The SKF Modular Range consists of a matrix range of rail guide modules which enable an individual choice of combinations of rails and rolling element assemblies. Different requirements for the guides do not call for changes in the design or mechanical environment. The choice of appropriate rail guides is determined solely by the mechanical conditions under which the guide system is to operate. The operating requirements are covered by five different models (fig 1) which may be defined as rail guides with:

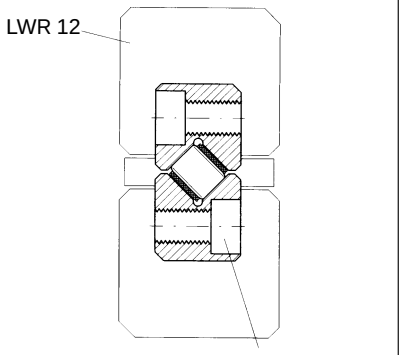
- crossed roller cage assemblies of the standard LWR series
- ball cage assemblies of the LWR series
- crossed roller cage assemblies of the optimised LWRE series
- needle roller cage assemblies of the LWRM/LWRV series
- slideway liners of the LWRPM/LWRPV series



1

Increased performance achievable without design modification

The Modular System is based on the well-proven LWR design which covers a wide range of applications. The new optimised LWRE series offers either doubled stiffness and a load carrying capacity increased by a factor of five or, alternatively, for a given load carrying capacity, a 50 % reduction in bearing size compared with the standard LWR design (fig 2).



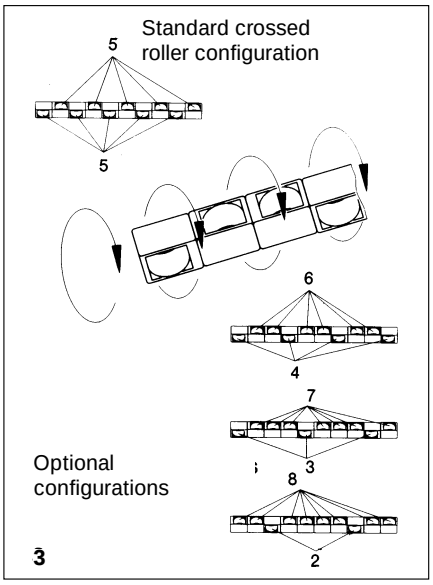
2

Complete range

In order to simplify the application of Modular Range of rail guides even easier, all guides within a given size range have the same external dimensions and thus fit the space requirements of most commercially available rail guides. This results in a very wide choice in terms of load carrying capacity, stiffness and operating characteristics.

From the economical point of view, the use of the optimised LWRE Series offers a double advantage. Firstly (although the initial cost is higher) the range of application is extended significantly as regards stiffness and load carrying capacity; this results in a better price/performance ratio. Secondly, the replacement of other rail guides, even those supplied by other manufacturers and already installed, can be carried out simply and with the minimum of delay.

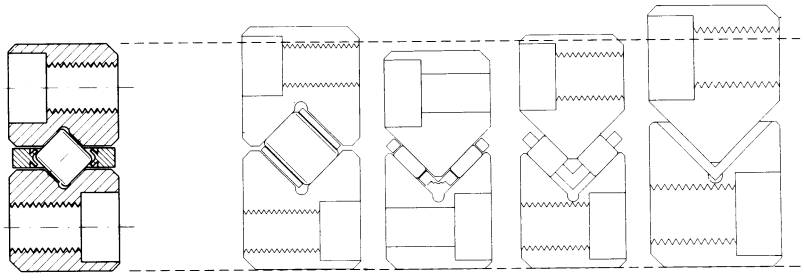
Above all, where the user needs to increase machine performance, a unit with a higher load rating can be fitted. In-situ replacement is made easier by the fact that no new attachment holes or fixing devices are required when using rail guides of the Modular Range. An additional advantage is the world-wide availability through distributors, simply by quoting the appropriate catalogue number. The internal design of the LWRE Series assures increased operational life through the even distribution of load. This results from the optimisation of the cross-section, enabled through the use of larger rolling elements. The new design allows a significant improvement in the roller/raceway contact performance. An important additional benefit from the updating programme is the introduction of the practically maintenance-free cage made of POM which matches are stringent demands for long operational life of the rolling elements and maintains is dimensional stability up to +80 °C. The individual rollers are well covered and the space between the rails is almost filled, thus providing good protection against contamination. A special characteristic of these cages is that they consist of ‘snap-on’ elements and can be adapted to suit individual needs (fig 3). Conventional crossed roller cages have their rollers arranged alternately evenly spaced, so that only half the rollers in a preloaded guide are load-bearing while the remainder act as idlers. In the new LWRE cage these essentially unused rollers cab be partially turned in the direction of the load. For this purpose each individual cage segment is designed to be turned through 90° about the longitudinal axis. These are manual adjustments and no special instructions are required when ordering from the catalogue.



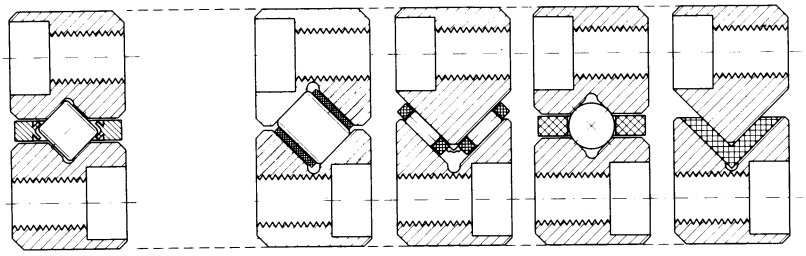
3

The Modular Range of guide rails
The blue shaded areas in the chart indicate the sizes included in the Modular Range. Some 80 % of applications can be covered by these (fig 4).

These standard, interchangeable rails of the Modular Range comprise most of the currently available types on the market (fig 5). The choice of a specific rolling element or, for extreme conditions, of a slideway liner, is determined only by the actual operating conditions (fig 6). Generally, any rail guide can be operated in the ‘clamped’ or ‘floating’ mode. The design of the rail guides does not impose any special space requirements.



Commercially available products



SKF Modular Range

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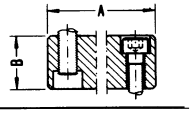

Type \ Size	A x B 8.5 x 4 — 1	12 x 6 — 2	18 x 8 — 3	31 x 15 — 6	44 x 22 — 9	58 x 28 — 12	71 x 36 — 15	83 x 14 — 18	110 x 55 — 24
LWR — LWR	X	X	X	X	X	X	O	O	O
LWRE — LWRE	–	–	X	X	X	–	–	–	–
LWRV — LWRM	–	–	–	X	X	O	O	–	–
LWRPV — LWRPM	–	–	X	X	X	O	O	–	–
LWR — LWR	X	X	X	X	X	X	O	O	O

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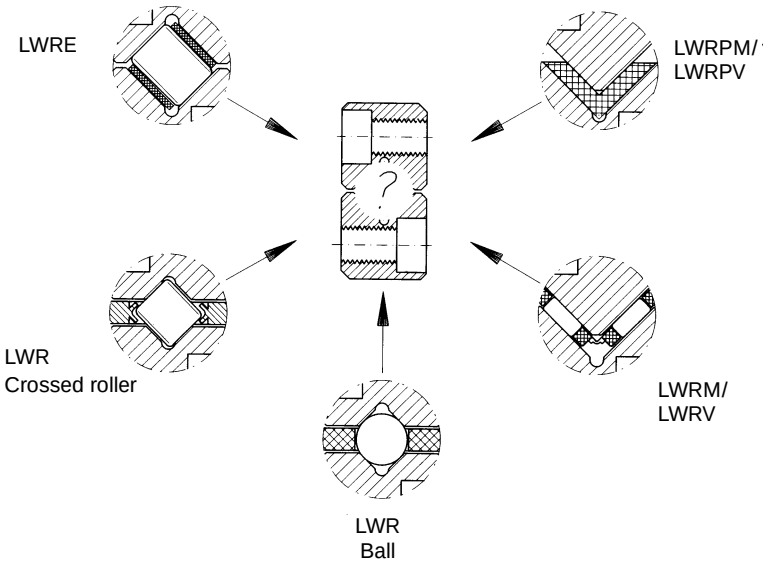
= Modular range

X = available ex-stock in standard lenghts
O = available to order
– = not available



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LWR series
This basic series of the Modular Range covers a wide range of applications for linear bearings with limited travel. Where low friction is essential, ball cage assemblies are recommended. If, on the other hand, high load carrying capacity is the chief requirement, crossed roller assemblies are to be preferred. The LWR series is manufactured in nine sizes based on rolling element dimensions.

LWRE series
For a given load carrying capacity, the dimension of the LWRE series are significantly less than those of the corresponding member of the LWR series. Thus, for instance, an LWRE 6 guide with a cage length of 100 mm has a greater load carrying capacity than a standard LWR 12. The LWR 12 measures 58 x 28 mm whereas the LWRE 6 measures only 31 x 15 mm (fig 2).

LWRM/LWRV series
These guides are used principally where high load carrying capacity is called for in combination with high stiffness, for instance on grinding machines. This series is fitted with needle roller and cage assemblies consisting of two rows of needle rollers at right angles to each other.

LWRPM/LWRPV series
Where short strokes of high frequency occur, this version with sliding liners is an essential alternative to those with rolling bearing assemblies. In the case of balls or rollers subjected to high transverse acceleration, pitting of the tracks may occur as a result of the unfavourable tribological conditions. Sliding rail guides are preferred in such circumstances. The liner material is based on PTFE and is bonded on to the unhardened LWRPM rail guide and then ground to the correct dimension.

These wear-resistant guides are characterised by their stick-slip-free, vibration-damping running properties, at the same time offering excellent stiffness and emergency running properties. These guide rails are largely unaffected by dirt, coolants and lubricants.

Materials and precision
The rails of the Modular Range guides are manufactured from tool steel 90 MnCrV 8 with a hardness of between 58 and 64 HRC. If required by the application, the rails can also be supplied in special stainless steel, e. g. X 90 CrMoV 18 in all standard dimensions. The rolling elements are made from carbon chromium steel 100 Cr 6 with a hardness of between 58 and 64 HRC. The parallelism of the raceways is divided into three classes. Class P10, with a maximum deviation of 10 µm per 1000 mm length, meets most of the demands for normal machinery. Where greater precision is required, tolerance classes P5 and P2 are also available.

The range is complemented by various accessories specially designed for the Modular Range of guide rails. These include end pieces with or without wipers, also special mounting screws.

Computerised Modular Range data
Data relating to the Modular Range of rail guides is also included in the LinCAD software program.

LinCAD consists of a selection and a graphics program, enabling the choice of rail guide and of its incorporation into a drawing.

Other products
In addition to the Modular Range, the selection of SKF products also includes a wide variety of rail guides and rolling elements.

LWM/LWV rail guides
(see table on pages 34 – 36)
LWM/LWV rail guides differ from the LWRM/LWRV guides of the Modular Range only in their external dimensions. The internal geometry is identical and the same needle roller assemblies are therefore used.

In contrast to the LWRM/LWRV (two series) the LWM/LWV guides comprise 6 series up to size of A x B = 80 mm x 50 mm. LWM/LWV rail guides are supplied as standard with holes of type 15, namely through holes with counterbore. If for design reasons, it is necessary to screw both rails from the same side, then one of the rails should have holes of type 13, i. e. with thread insert.

LWML rail guides
(no table)
The LWML rail guide consists of a modified LWM rail guide with the addition of an adjustment wedge. Used in conjunction with an LWV unit and a needle roller assembly this provides an adjustable rail guide. The inclination of the wedge surface is 1,5 % so that a displacement of the wedge by 1 mm brings about a 15 µm alteration in the height.

LWM/LWV rails are supplied as standard with holes type 15 or, if required, with holes of type 13, i. e. with thread insert.

LWML rails can be supplied to tolerance classes P10 and P5.

The LWML rail guides, as well as the appropriate needle roller assemblies and end pieces, are made to order.

Because of the many permutations available, each par of an LWML/LWV rail guide system must be ordered separately, e. g.:

1 rail LWML 55200400
1 rail LWM 40200400
2 rails LWV 40200400
2 end pieces LWEML 4020
2 end pieces LWEM 4020

It should also be stated whether the holes are required for right-hand or left-hand mounting.

LWN/LWO rail guides
(no table)
LWN/LWO rail guides differ from the LWM/LWV rail guides only in their height, width and attachment holes. The internal geometry is identical to that of the LWM/LWV types, i. e. they have the same load rating.

LWN/LWO rail guides are available in tolerance classes P10, P5 and P2 to order.

LWW/LWZ flat rail guides
(no table)
LWW/LWZ flat rail guides are used in conjunction with LWR rail guides for the construction of slides. LWW/LWZ flat rail guides and the appropriate rolling bearing assemblies and end pieces are made to order.

LWJ/LWS flat rail guides
(no table)
LWJ/LWS flat rail guides are used in conjunction with LWRM/LWRV, LWM/LWV or LWN/LWO rails as non-locating rail guide assemblies. They are used in the construction of slides.

LWJ/LWS flat rail guides, as well as the appropriate rolling bearing assemblies and end pieces are available to order.

Special rail guides and recirculating roller guides
In addition to the standard rail guides included in this catalogue, SKF also manufactures flat rail guides with recirculating roller assemblies as well as special rail guides to customers' own drawings for such applications as machine tools, handling systems and robotics.

Further information on these special versions and their availability will be supplied on request.

Technical data

Precision of rail guides
SKF precision rail guides, regardless of type, are available in the same tolerance grades as indicated below.

Raceway accuracy
To meet the different requirements in terms of precision of linear bearing arrangements, the rails are produced in three different tolerance classes. These are classified according to the parallelism between the raceways and the support surfaces A and B (fig 7).

P10
Tolerance class normal. This meets the requirements of general engineering applications. The deviation from parallelism for a 1000 mm long rail is approximately 10 µm. See also adjacent table 1.

P5
This corresponds to the normal precision requirements for machine tool applications. The deviation from parallelism for 1000 mm long rail is approximately 5 µm. See also adjacent table 1.

P2
Higher accuracy than P5 for the most exacting demands in terms of accuracy of a linear guidance system. Rails made to this tolerance class should only be used when the associated components can be made to a correspondingly high degree of precision. Rails to tolerance class P2 will be manufactured by SKF to special order, the maximum available length being 1000 mm. The deviation from parallelism for a 1000 mm long rail is approximately 2 µm.

If no mention is made of the requisite accuracy on the order, rails made to normal P10 tolerances will be supplied.

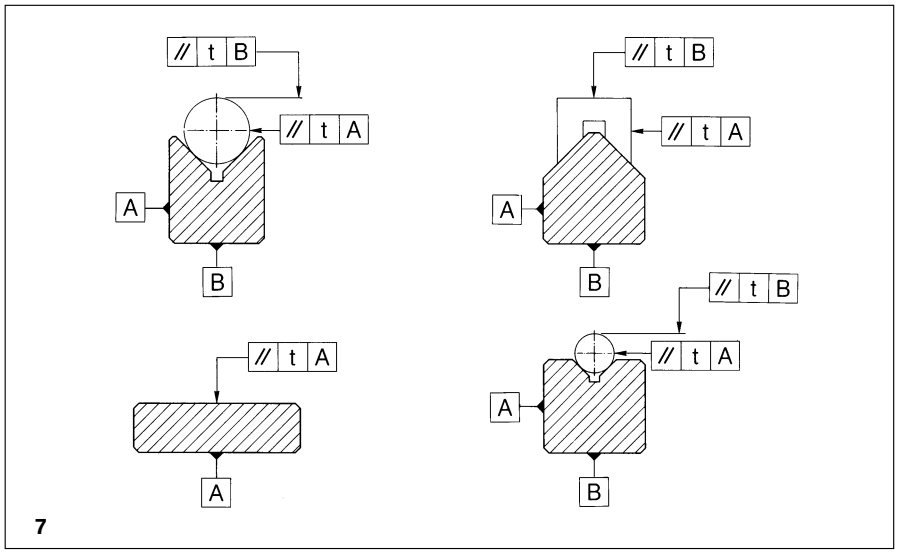
Dimensional accuracy
SKF rail guides with limited travel are produced to the following tolerances (figs. 8 and 9):

Width A: 0/-0,3mm
Abutment height
$T = B_1 + B_2$ ± 0,02 mm
Rail height B: 0/-0,2 mm
Rail length L: ± 0,001 · L mm

For rails composed of two or more sections the tolerance for the total length is ± 2 mm.

SKF precision rail guides for recirculating roller assemblies are produced to the following tolerances:

Width A: 0/+0,1 mm
Height A: 0/+0,1 mm
Length L: 0/+0,002 · L mm



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Permissible deviation in parallelism between surfaces A and B

Rail length from	to	Tolerance class P10	P5	P2
mm		µm		
	100	2	1	1
100	**200**	3	1	1
200	**300**	4	2	1
300	**400**	5	2	1
400	**500**	6	3	1
500	**600**	7	3	2
600	**700**	8	4	2
700	**800**	8	4	2
800	**900**	9	5	2
900	**1000**	9	5	2
1000	**1200**	10	6	
1200	**1400**	11	6	

Table 1

Grading

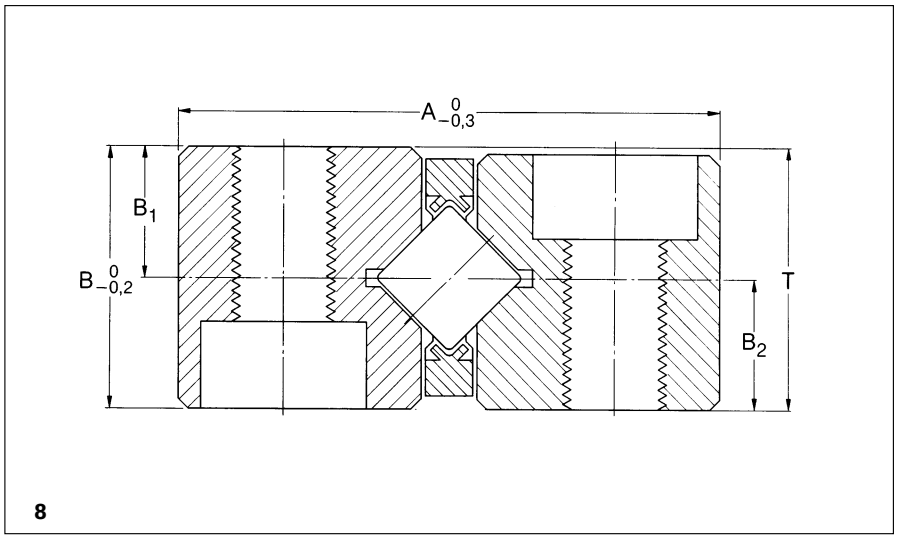
Precision rail guides are generally mounted in pairs. In order to obtain the same assembly width A and height T (fig 8) the rails are graded and supplied in pairs.

This ensures that any two similar rail guides in a system will have the same height. The grading accuracy is always within the appropriate tolerance class for the parallelism.

If two or more rolling element assemblies are to be mounted immediately behind each other in a rail guide, the rolling elements must have the same tolerance grade. On request, graded rolling element assemblies can be supplied.

Rails of the same profile for recirculating roller assemblies, which are to be mounted immediately adjacent to each other or immediately behind eych other should be ordered specially. These will be graded in height or in height and width depending on the design and then delivered as a single package.

Built-up rail guides are always matched so that it is not necessary to request this when ordering.



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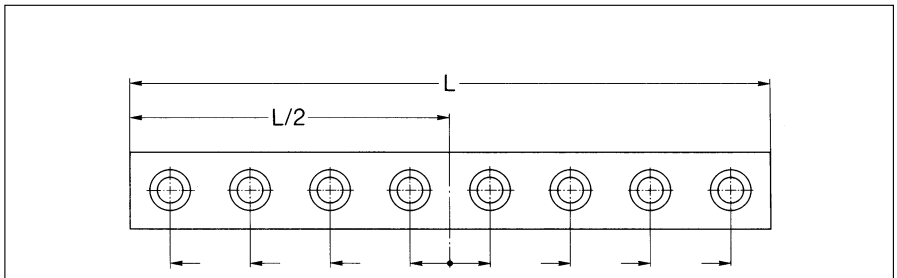
Tolerance of interval between holes

The maximum deviation in the interval between holes measured from centre to centre is ± 0,8 $^{0}/_{00}$ of the rail length L for one-piece rails (fig 9). The tolerance for built-up rails is also ± 0,8 $^{0}/_{00}$ but related to the length of the longest section. Rails having tighter tolerances for the interval between holes can be supplied on request.



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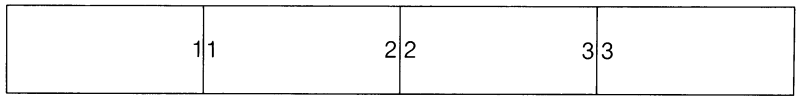


9 a

Marking of matched sets

Matched components are marked with consecutive numbers as indicated in fig 9a.

Accuracy of adjacent components
An important criterion for the correct performance of a rail guide system is the accuracy of the associated components. The higher the demands for accuracy of guidance and for smooth, easy operation, the greater the attention which must be paid to the accuracy of form and position of the associated components. Generally the same accuracy requirements should be applied to these components as to the rail guides themselves. The adjacent table shows the values, for each tolerance class, of the surface roughness, rectangularity and parallelism of the adjacent components.

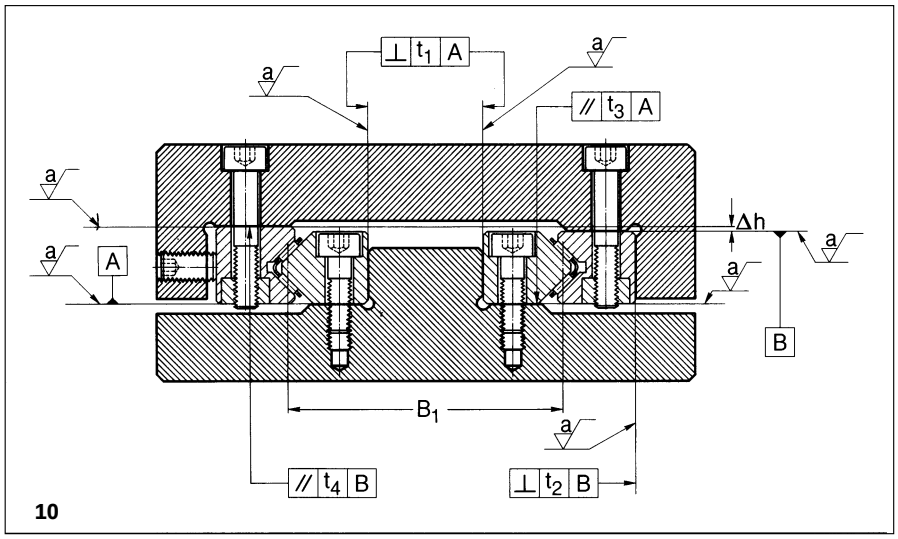
To assure an even load distribution over the roller length, the maximum difference in height of the supports for a rail guide should not exceed

$\Delta h = 0{,}1 \cdot B_1$

where

Δh = Maximum height deviation, µm
B_1 = mean distance between two rail guides, mm

To obtain good support for the rails on the associated components the attachment holes should be carefully deburred (figs 10 and 11).



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Accuracy of form of support surfaces

Characteristic	Symbol for		Permissible deviation of form			
	Characteristic	Tolerance zone	Dimensions	Tolerance class		
				P10	P5	P2
Roughness R_a	▽	a	µm	1,6	0,8	0,2
Perpendicularity	⊥	t_1/t_2	µm/mm	0,3	0,3	0,3
Parallelism	//	t_3/T_4	µm	depending on the guide length L. (mm)		
				3	2	1	200
				6	4	2	500
				10	6	3	1000

11

Selection of a rail guide for limited travel
When selecting a rail guide for limited travel, the length of travel, load carrying capacity, requisite life and stiffness are governing factors. Other factors are also important, including the requisite speed of travel, lubrication, operating temperature, ease of movement, environmental influences and certain design constraints, for instance whether “clamped” or “floating” guidance is required.

The most important considerations when selecting the size and length of the rolling element assembly are load carrying capacity, life and stiffness.

For light, centrally acting loads and moderate demands for speed of travel, it is possible to use practically all the types of guides listed in this catalogue. However, technical and economic reasons often dictate the choice of the most appropriate model for a given application.

In selecting the length of a rail guide and of the individual rails, the travel as well as the load carrying capacity and the main factors, the length of the cage assembly being chosen to give the requisite life.

The following relationships serve as guidelines in making such calculations:
For a given length to travel:

Cage length = stroke, at least

For a given cage length:

Rail length = cage length
+ 0,5 x stroke

For a given rail length and stroke, the cage length is given by:

Cage length = Rail length
– 0,5 x stroke

LWR Precision rail guides

LWR rail guides are well-proven, limited-travel, linear guides used in numerous applications. They consist of two identical rails between which crossed roller assemblies or ball assemblies are inserted, depending on the application.

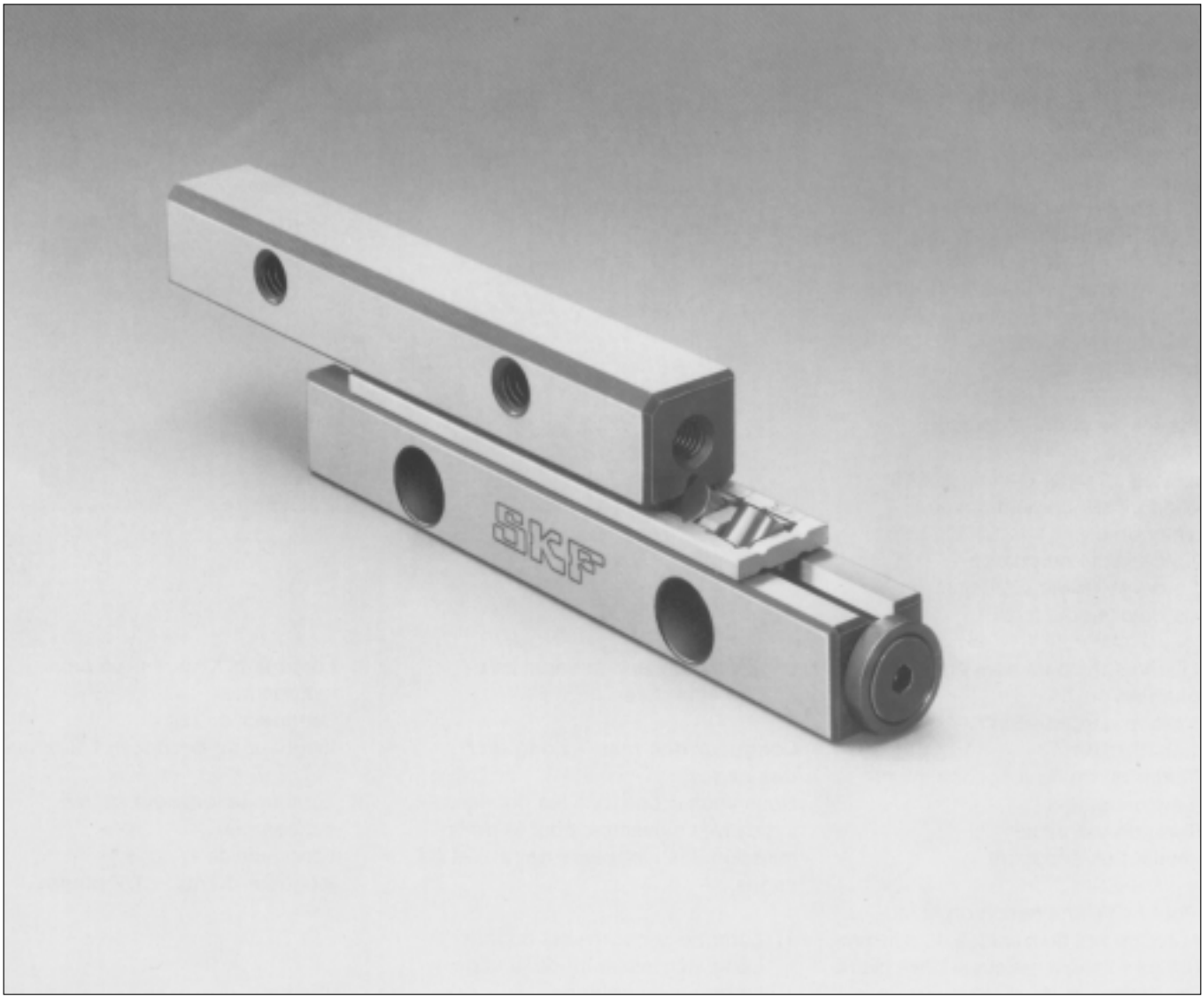
LWR rail guides with crossed roller assembly are robust linear bearings with high load carrying capacity. Their special characteristics make them suitable for a large proportion of linear bearing arrangements with limited travel.

LWR rail guides will ball assembly can be used to advantage where loads are light and easy running is required.

Rails with a length greater than 1200 mm are supplied in sections.

Because of the many permutations available, each part of an LWR rail guide system must be ordered separately, e. g:

4 rails LWR 90600
2 crossed roller cage assemblies
LWAL 9 x 25
8 end pieces LWERB 9



Ball and crossed roller assemblies for LWR rail guides

Ball assemblies
Where moderate loads are to be supported by a rail guide and greater priority is given to smooth operation and low friction, the use of ball assemblies is recommended.

LWJK ball assemblies are provided with a plastic ball-retaining cage. These are available for sizes 1 to 12, the cages for sizes 6 and upwards being reinforced with steel wire.

LWJJ ball assemblies with brass cage are available in sizes 1 to 24. For sizes 6 to 12, the balls are retained through staggering or the apertures.

Crossed roller assemblies
Where greater stiffness is required, crossed roller assemblies are recommended. Various cage types are available, depending on the size of the rollers.

LWAK crossed roller assemblies are fitted as standard with a plastic cage to retain the cylindrical rollers.

From size 3 upwards, metal cages are also available:
LWAA crossed roller assemblies with retained rollers in pressed steel cage for sizes 3 and 15.

LWDD crossed roller units with non-retained cylindrical rollers and brass cage are available from size 3 to 24.

LWAL crossed roller assemblies are available in sizes 6 to 12 with aluminium cages. In this case the rollers are retained. An overview of the various rolling element assemblies will be found on page 18.

End pieces for LWR rail guides
End pieces prevent the drift of the cage away from the loaded zone.

LWERA end pieces
fulfil these requirements in low-load conditions combined with horizontal mounting.

LWERB end pieces should be used for high loads and vertical mounting.

LWERC end pieces have the additional feature of a felt wiper with sealing lip to keep the track free from dirt.

All end pieces are supplied with attachment screws.

LWGD special attachment screws can be used for all rails within the Modular Range.

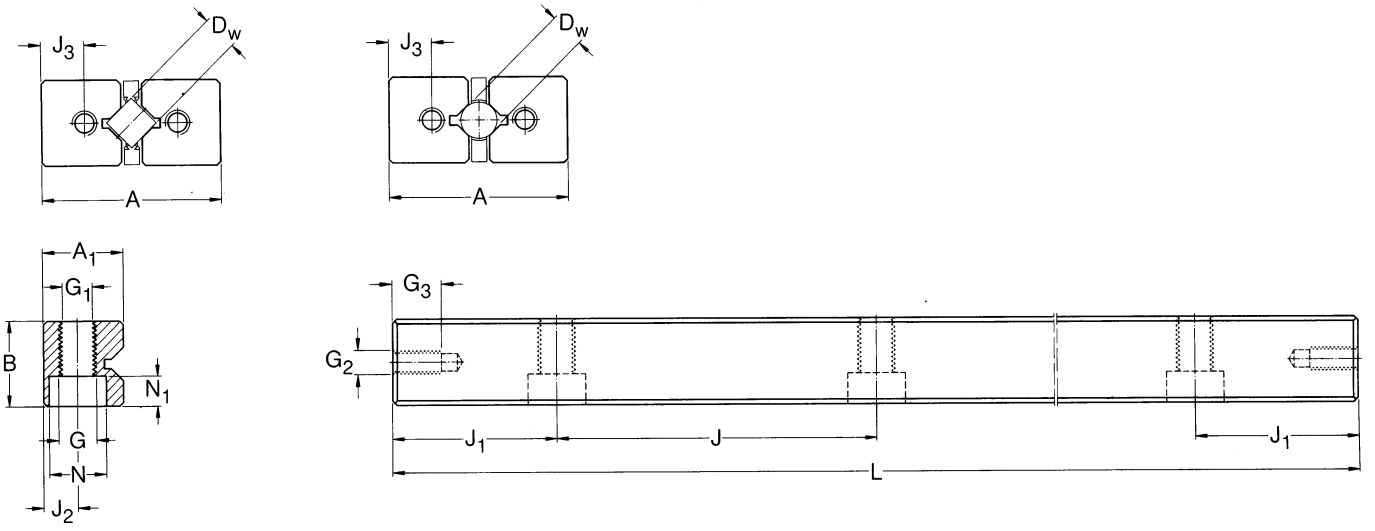
SKF Modular Range
The LWR rail guides form the basis for the whole Modular Range system. In this catalogue all guides with designations commencing LWR... are interchangeable with each other within a given dimension series. All external and attachment dimensions correspond with those of the LWR series.

LWR rail guides are available in an total of nine sizes. Within the “Modular Range” sizes 3, 6 and 9 are included which, according to experience, cover 80 % of the normal market requirements. To enable prompt delivery from stock, certain standard rail lengths have been defined.

Please refer to the tables for further data on the Modular Range of rail guides. Further information can also be found on pages 6 to 9.

LWR rail guides

LWR 1 – LWR 24

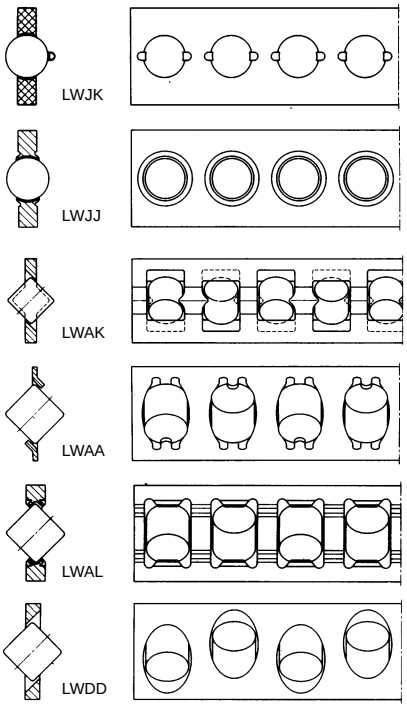


Designation	Dimensions: System				Monting holes							End face holes			Available lenghts								
	A	B	A_1	D_w	J	J_1	J_2	G	G_1	N	N_1	J_3	G_2	G_3	L[1]								
	mm														020	030	040	045	050	060	070	075	080
LWR 1	**8,5**	**4**	3,9	1,5	10	5	1,8	M2	1,65	3	1,4	1,9	M1,6	2	•	•	•		•	•	o		o
LWR 2	**12**	**6**	5,5	2	15	7,5	2,5	M3	2,55	4,4	2	2,7	M2,5	3		•		•		•		•	

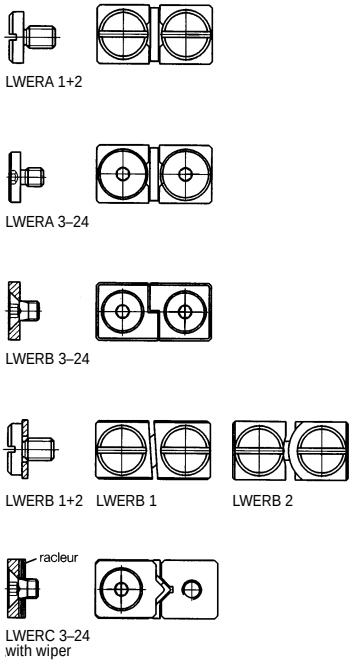
Designation	Dimensions: System				Mounting holes							End face holes			Available lengths								
	A	B	A_1	D_w	J	J_1	J_2	G	G_1	N	N_1	J_3	G_2	G_3	L[1]								
	mm														050	075	100	125	150	175	200	225	250
LWR 3	**18**	**8**	8,3	3	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6	⊡	⊡	⊡	⊡	⊡	⊡	⊡	o	•
LWR 6	**31**	**15**	13,9	6	50	25	6	M6	5,2	9,5	5,2	7	M5	9			⊡	o	⊡		⊡		⊡
LWR 9	**44**	**22**	19,7	9	100	50	9	M8	6,8	10,5	6,2	10	M6	9							⊡		
LWR 12	**58**	**28**	25,9	12	100	50	12	M10	8,5	13,5	8,2	13	M8	12							o		
LWR 15	**71**	**36**	31,9	15	100	50	14	M12	10,5	16,5	10,2	16	M8	12									
LWR 18	**83**	**40**	37,4	18	100	50	18	M14	12,5	18,5	12,2	18,7	M10	12									
LWR 24	**110**	**55**	49,9	24	100	50	24	M16	14,5	22,5	14,2	25	M10	12									

[1] Other lengths available to special order

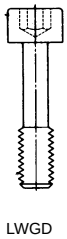
Ball and crossed roller assemblies



End pieces



Special attachment screws



LWGD

							Ball and crossed roller assemblies				End pieces[1]			Special attachment screws
090	100	105	120	135	150		LWJK	LWJJ	LWAK		LWERA	LWERB	LWERC	LWGD
o	o						•	o	•		•	•	•	
•		•	•	o	o		•	o	•		•	•	•	

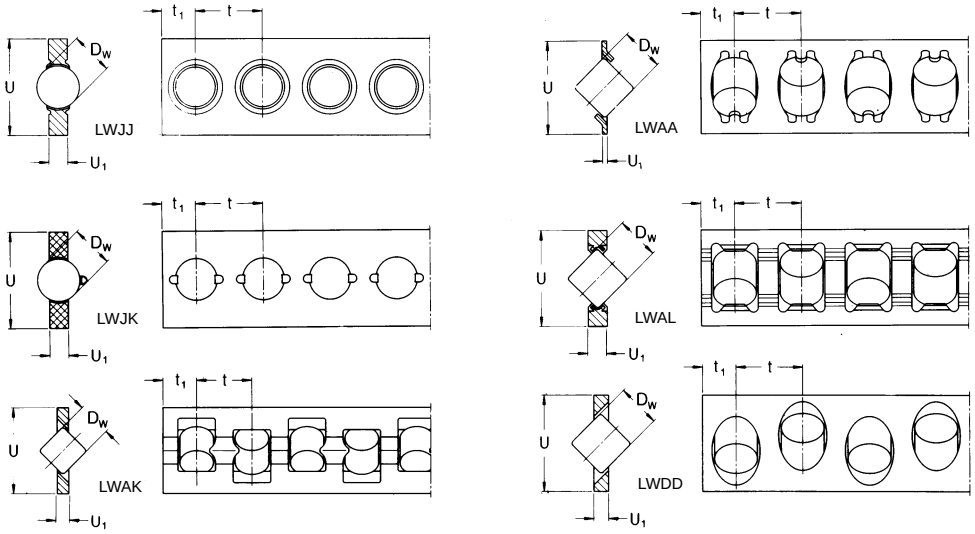
														Ball and crossed roller assemblies						End pieces			Special attachment screws
275	300	350	400	450	500	550	600	650	700	800	900	1000		LWJK	LWJJ	LWAK	LWAA	LWAL	LWDD	LWERA	LWERB	LWERC	LWGD
o	•													•	o	•	•		o	•	•	•	•
	⊡	•	⊡	•	•	o	o	o	o					•	o		o	•	o	•	•	•	•
	⊡		⊡		⊡		•		•	o	o	o		•	o		o	•	o	•	•	•	•
	•	o	•	o	•	o	•	o	o	o	o	o		•	o		o	•	o	•	•	•	•
	o		o		o		o		o	o	o	o			o		o		o	•	•	•	•
	o		o		o		o		o	o	o	o			o				o	•	•	•	•
	o		o		o		o		o	o	o	o			o				o	•	•	•	•

⊡ **SKF Modular Range.**
Preferred range, prompt delivery
• Prompt delivery
o Available to order

Example: 4 LWR 3100 or 4LWR90200
2 LWJK 3 x 17 2LWLA9x10
8 LWERB 3 4LWERC9

Accessories for LWR rail guides

Ball and crossed roller assemblies



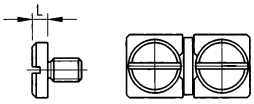
For description and data relating
to rolling element assemblies, see page 15

For calculation of the cage length, see page 13

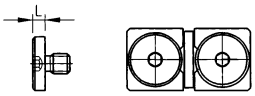
Designation[1]	**Dimensions**					**Load ratings** for 10 rolling elements dynamic	static	**Appropriate rail guide**
	D_w	U	U_1	t	t_1	C	C_0	
	mm					N		
LWJK 1	**1,5**	3,5	0,5	2,2	1,4	305	170	**LWR 1**
LWJJ 1		3,5	0,4	3	2,2	305	170	
LWAK 1		3,75	0,5	3	2,2	365	585	
LWJK 2	**2**	5	0,7	3,9	2,9	570	300	**LWR 2**
LWJJ 2		5	0,7	4	3	570	300	
LWAK 2		5,5	0,7	4	3	540	680	
LWJJ 3	**3**	7	1	5	3.5	1 340	690	**LWR 3**
LWJK 3		7	1	4,2	2,7	1 340	680	
LWDD3		7	1	5	3,5	1 320	1 600	
LWAK 3		7,5	1	5	3,5	1 320	1 600	
LWAA 3		7	0,5	5	3,5	1 320	1 600	
LWJJ 6	**6**	15	2,7	9	6	5 850	2 700	**LWR 6**
LWJK 6		14	2,5	9	6	5 850	2 700	
LWAL 6		14,8	2,7	9	6	5 850	6 800	
LWDD 6		15	2,7	9	6	5 850	6 800	
LWJJ 9	**9**	20	4	14	9,5	14 000	6 100	**LWR 9**
LWJK 9		20	3,5	14	9,5	14 000	6 100	
LWAL 9		20	4	14	9,4	17 000	18 300	
LWDD 9		20	4	14	9,5	17 000	18 300	
LWJJ 12	**12**	25	5	18	12	25 500	10 800	**LWR 12**
LWJK 12		20	4	15,5	9,5	25 000	10 800	
LWAL 12		25	5	18	12	30 000	30 500	
LWDD 12		25	5	18	12	30 000	30 500	
LWJJ 15	**15**	35	5	20	12,5	41 500	17 000	**LWR 15**
LWAA 15		31	1,2	20	12,5	50 000	56 000	
LWDD 15		35	5	20	12,5	50 000	56 000	
LWJJ 18	**18**	40	6	25	16	62 000	24 500	**LWR 18**
LWDD 18		40	6	25	16	75 000	91 500	
LWJJ 24	**24**	50	8	35	23	114 000	43 000	**LWR 24**
LWDD 24		50	8	35	23	150 000	186 000	

[1] Cage to types printed in bold type are readily available from stock

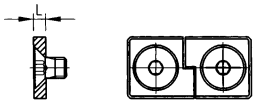
End pieces



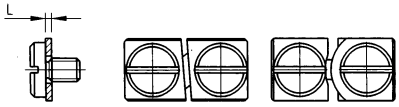
LWERA 1+2



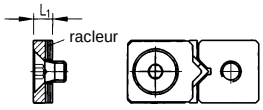
LWERA 3–24



LWERB 3–24

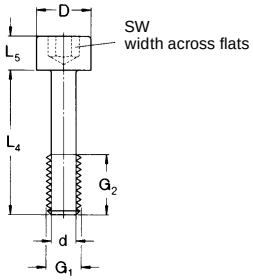


LWERB 1+2 LWERB 1 LWERB 2



LWERC 3–24
with wiper

Special attachment screws



LWGD

Designation		Dimensions		Appropriate attachment screw		Designation	Dimensions						
End pieces	End pieces with wiper	L	L_1			Special attachment screws	G1	G2	L4	L5	D	d	SW[2]
		mm		DIN 963				mm					
LWERA 1	–	1	–	M 1,6	–		–	–	–	–	–	–	–
LWERB 1	–	0,5	–	M 1,6									
LWERA 2	–	1,5	–	M 2,5	–		–	–	–	–		–	–
LWERB 2	–	0,5	–	M 2,5									
LWERA 3	–	2,5	–	M 3		**LWGD 3**	M 3	5	12	3	5	2,3	2,5
LWERB 3	–	2	–	M 3	DIN 7991								
–	**LWERC 3**	2	5	M 3									
LWERA 6	–	3	–	M 5		**LWGD 6**	M 5	8	20	5	8	3,9	4
LWERB 6	–	3	–	M 5	DIN 7991								
–	**LWERC 6**	3	6	M 5	DIN 7991								
LWERA 9	–	4	–	M 6		**LWGD 9**	M 6	12	30	6	8,5	4,6	5
LWERB 9	–	4	–	M 6	DIN 7991								
–	**LWERC 9**	4	7	M 6	DIN 7991								
LWERA 12	–	5	–	M 8		**LWGD 12**	M 8	17	40	8	11,3	6,2	6
LWERB 12	–	5	–	M 8	DIN 7991								
–	**LWERC 12**	5	8	M 8	DIN 7991								
LWERA 15	–	5	–	M 8		**LWGD 15**	M 10	16	45	10	13,9	7,9	8
LWERB 15	–	5	–	M 8	DIN 7991								
–	**LWERC 15**	5	9	M 8	DIN 7991								
LWERA 18	–	6	–	M 10		**LWGD 18**	M 12	19	50	12	15,8	9,6	10
LWERB 18	–	6	–	M 10	DIN 7991								
–	**LWERC 18**	6	9	M 10	DIN 7991								
LWERA 24	–	6	–	M 10		**LWGD 24**	M 14	26	70	14	19,5	11,2	12
LWERB 24	–	6	–	M 10	DIN 7991								
–	**LWERC 24**	6	9	M 10	DIN 7991								

[2] Width across flats of internal hexagon

LWRE rail guides

LWRE rail guides are a logical development of the proven LWR rail guides.

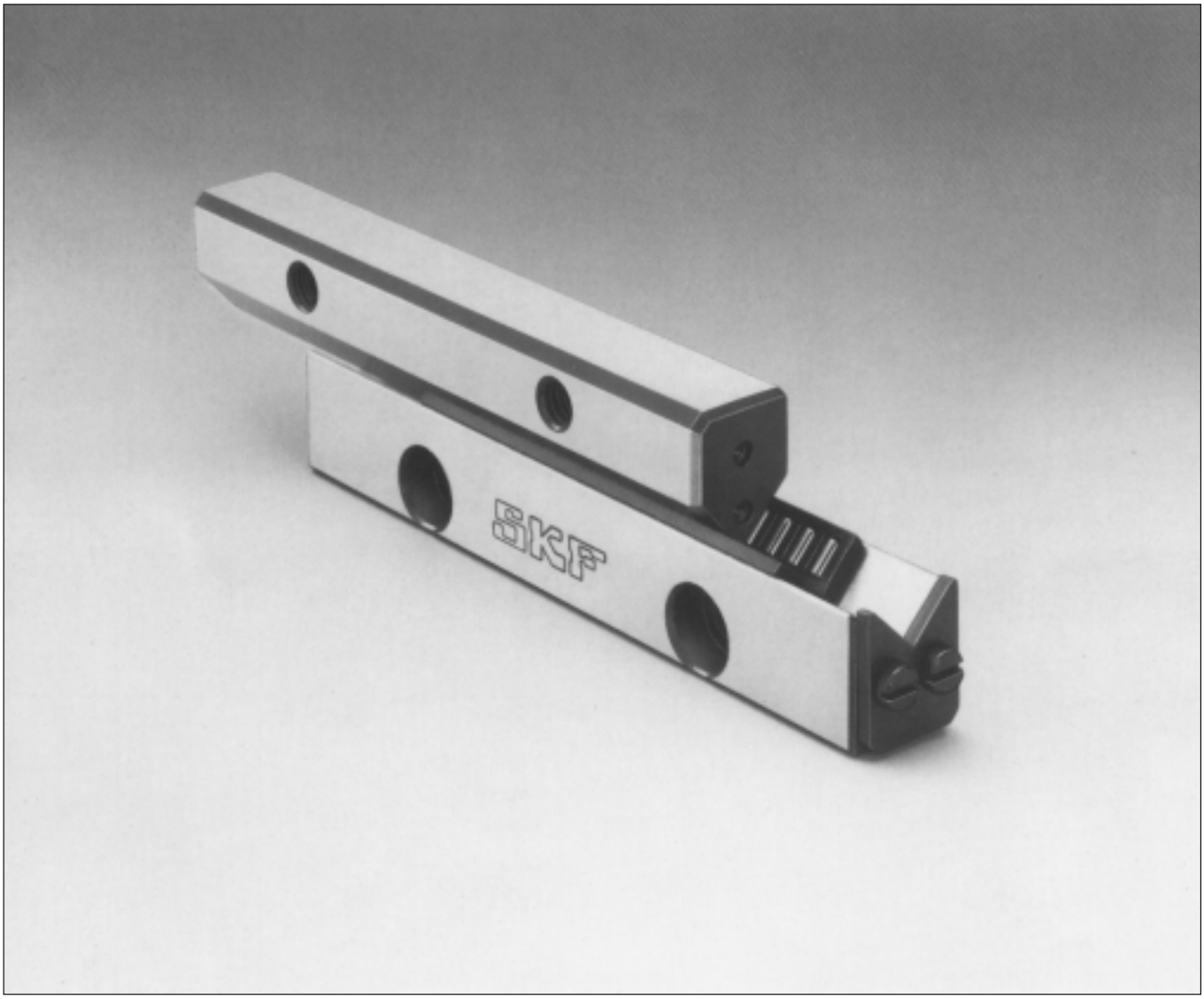
Within the Modular Range system the LWRE rail guides offer an outstanding price/performance ratio. Alongside the familiar characteristics of the LWR series, the new LWRE rail guides offer the advantages of a five-fold increase in the load carrying capacity and a doubling of the stiffness, achieved through optimised internal geometry in conjunction with larger roller diameters.

LWRE rail guides offer a greatly increased safety margin, thus a very much smaller LWRE rail guide can be used in a given design space while maintaining the same load carrying capacity as the LWR.

The mounting and attachment dimensions of the LWRE rail guides conform to those of all the SKF Modular Range rail guides included in this catalogue.

Rail guides of more than 1200 mm in length should be built up of sections.

Because of the large number of possible combinations, each of the components parts of LWRE rail guides must be ordered separately, e. g:
4 rail guides LWRE 6200
2 crossed roller assemblies
LWAKE 6 x 13
4 end pieces LWERE 6



Crossed roller assemblies for LWRE rail guides

LWAKE crossed roller assemblies are fitted with a plastic cage with retained rollers.

The elements of the cage are assembled using a 'snap in' technique whereby each element can be rotated manually through an angle of 90°. The load rating and stiffness can be enhanced by this technique. Dimensional stability of the LWAKE crossed roller assembly is maintained up to a temperature of +80°C. The cage retains the rollers and at the same time almost fills the free space between the rails, thus providing good protection against the ingress of dirt.

End pieces for LWRE rail guides
End pieces serve to restrict the drift of the crossed roller assemblies away from the loaded zone.

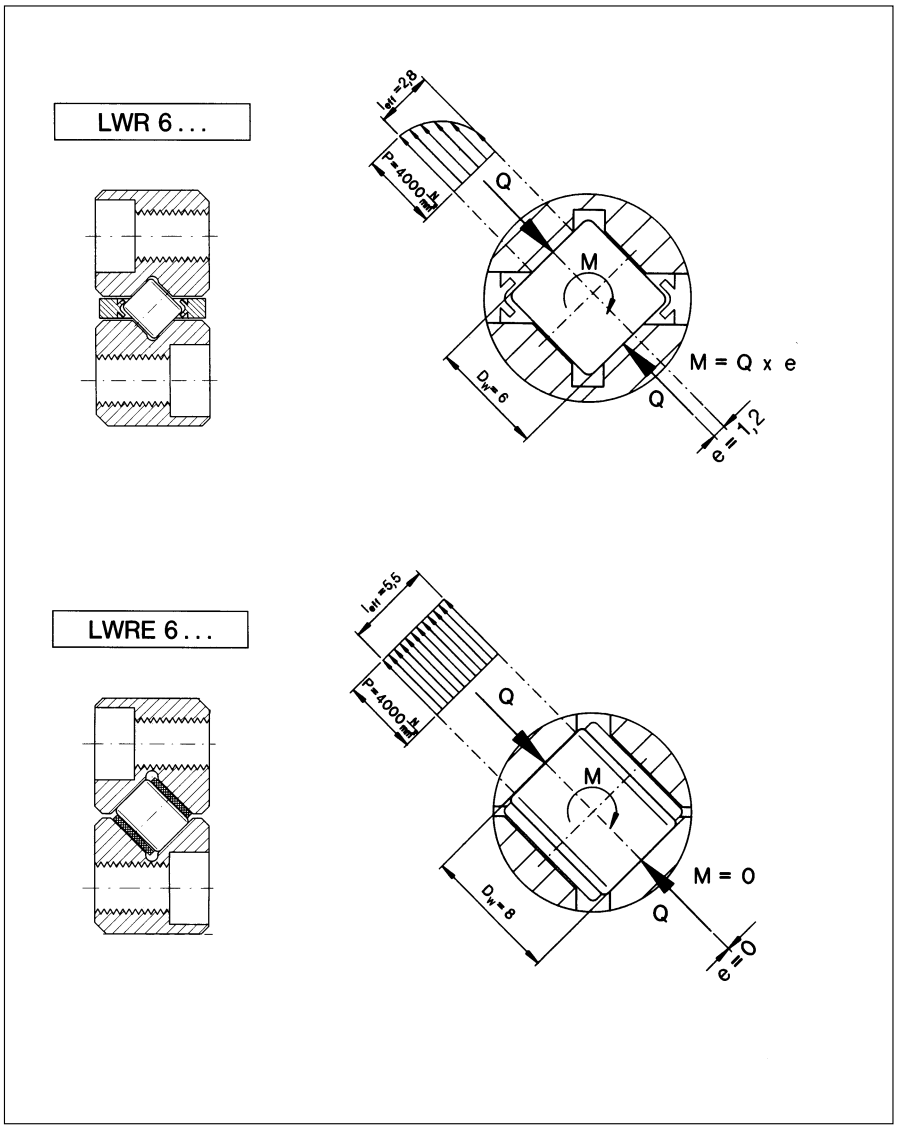
LWERE end pieces are generally used for horizontal and vertical applications.

LWEREC end pieces should be used where it is necessary to reduce the risk of contamination of the raceways. These end pieces are fitted with a plastic wiper with a sealing lip.

All end pieces are supplied with appropriate fixing screws.

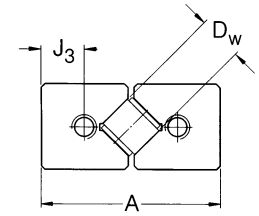
Special attachment screws for LWRE rail guides
For designations and dimensions please refer to page 19. The **LWGD special attachment screws** listed in the tables may be selected to suit each size of LWRE rail guide.

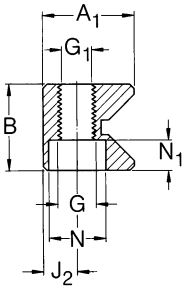
Internal geometry of LWR and LWRE rail guides
Normal LWR rail guides utilise only about 40 % of the roller length: Due to parallel displaced load direction forces on to the LWR rail guides exerts an internal tilting moment on the rollers. This can lead to high edge stresses and hence to a reduction of load carrying capacity. LWRE rail guides, on the other hand, utilise the whole roller length. The internal geometry is such that no tilting moment can occur and there are no edge stresses. At the same time the diameter of the rollers has been considerably increased (+33%).
These features provide the following advantages:
– fivefold increase in load carrying capacity
– 100 % increase in stiffness

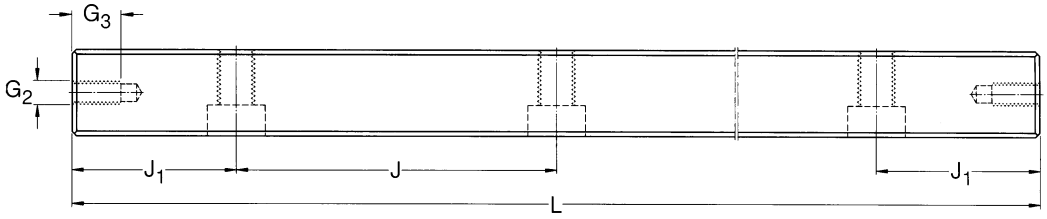


LWRE rail guides

LWRE 3 – LWRE 9





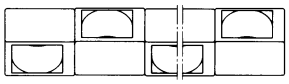


Designation:	Dimensions: System				Attachment holes							End face holes			Available lengths							
	A	**B**	A_1	D_w	J	J_1	J_2	G	G_1	N	N_1	J_3	G_2	G_3	$L^{1)}$							
	mm														050	075	100	125	150	175	200	
LWRE 3	**18**	**8**	8,7	4	25	12,5	3,5	M 4	3,3	6	3,2	4	M 3	6	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
LWRE 6	**31**	**15**	15,2	8	50	25	6	M 6	5.2	9,5	5,2	6,75	M 5	9			⊙		⊙		⊙	
LWRE 9	**44**	**22**	21,7	12	100	50	9	M 8	6,8	10,5	6,2	9,75	M 6	9							⊙	

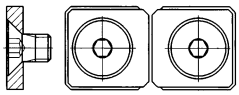
[1)] other lengths available to order

Crossed roller assemblies

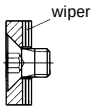
LWAKE

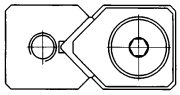


End pieces



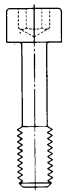
LWERE





LWEREC
with wiper

Special attachment screws



LWGD

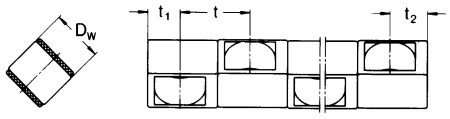
																Crossed roller assemblies	End pieces		Special attachment screws
225	250	275	300	350	400	450	500	550	600	650	700	800	900	1000	LWAKE	LWERE	LWEREC	LWGD
o	o	o	o												•	•	•	•
	⊡		⊡	o	⊡	o	o	o	o	o	o				•	•	•	•
			⊡		⊡		⊡		•		•	o	o	o	•	•	•	•

⊡ **SKF Modular Range**
Preferred range, prompt delivery
• Prompt delivery
o special order

Ordering example:
4 LWRE 90400
2 LWAKE 9 x 22
4 LWERE 9
16 LWGD 9

Accessories for LWRE rail guides

Crossed roller assemblies

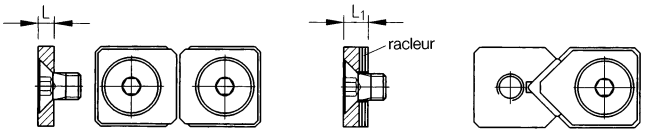


LWAKE

For description and data on crossed roller assemblies, please see page 21

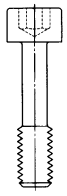
Designation	Dimensions				Load ratings for 10 rollers per row		Rail guide designations
	D_w	t	t_1	t_2	dynamic C	static C_0	
	mm				N		
LWAKE 3	4	6,25	2,65	3,6	6 300	8 500	**LWRE 3**
LWAKE 6	8	11	5	3,6	39 000	39 000	**LWRE 6**
LWAKE 9	12	16	8,65	3,6	78 000	78 000	**LWRE 9**

End pieces



LWERE LWEREC

Special attachment screws



LWGD

for designation and dimensions see page 19

Designation		Dimensions		Appropriate attachment screw	Rail guide designation
without wiper	with wiper	L	L_1		
		mm		DIN 7991	
LWERE 3		2		M 3	**LWRE 3**
	LWEREC 3		4	M 3	**LWRE 3**
LWERE 6		3		M 5	**LWRE 6**
	LWEREC 6		5	M 5	**LWRE 6**
LWERE 9		3		M 6	**LWRE 9**
	LWEREC 9		6	M 6	**LWRE 9**

LWRM/LWRV rail guides

LWRM/LWRV rail guides offer rail guide systems with high load carrying capacity and maximum stiffness.

Needle roller assemblies for LWRM/LWRV rail guides

LWHV needle roller assemblies consisting of a plastic cage with retained needle rollers, are available for rail guides of sizes 6 and 9. The elastic connection between the two cage sections for the two roller rows enables the cage to bend to any angle.

LWHW needle roller assemblies have aluminium cages with provide retention of the needle rollers. They are available for size 9 units.

When ordering, the appropriate cage length in mm should be stated after the cage designation, e. g: LWHV 10 x 225.

End pieces for LWRM/LWRV rail guides
End pieces serve to restrict the drift of the needle roller assemblies away from the loaded zone.

LWERM and LWERV end pieces are suitable for both horizontal and vertical applications.

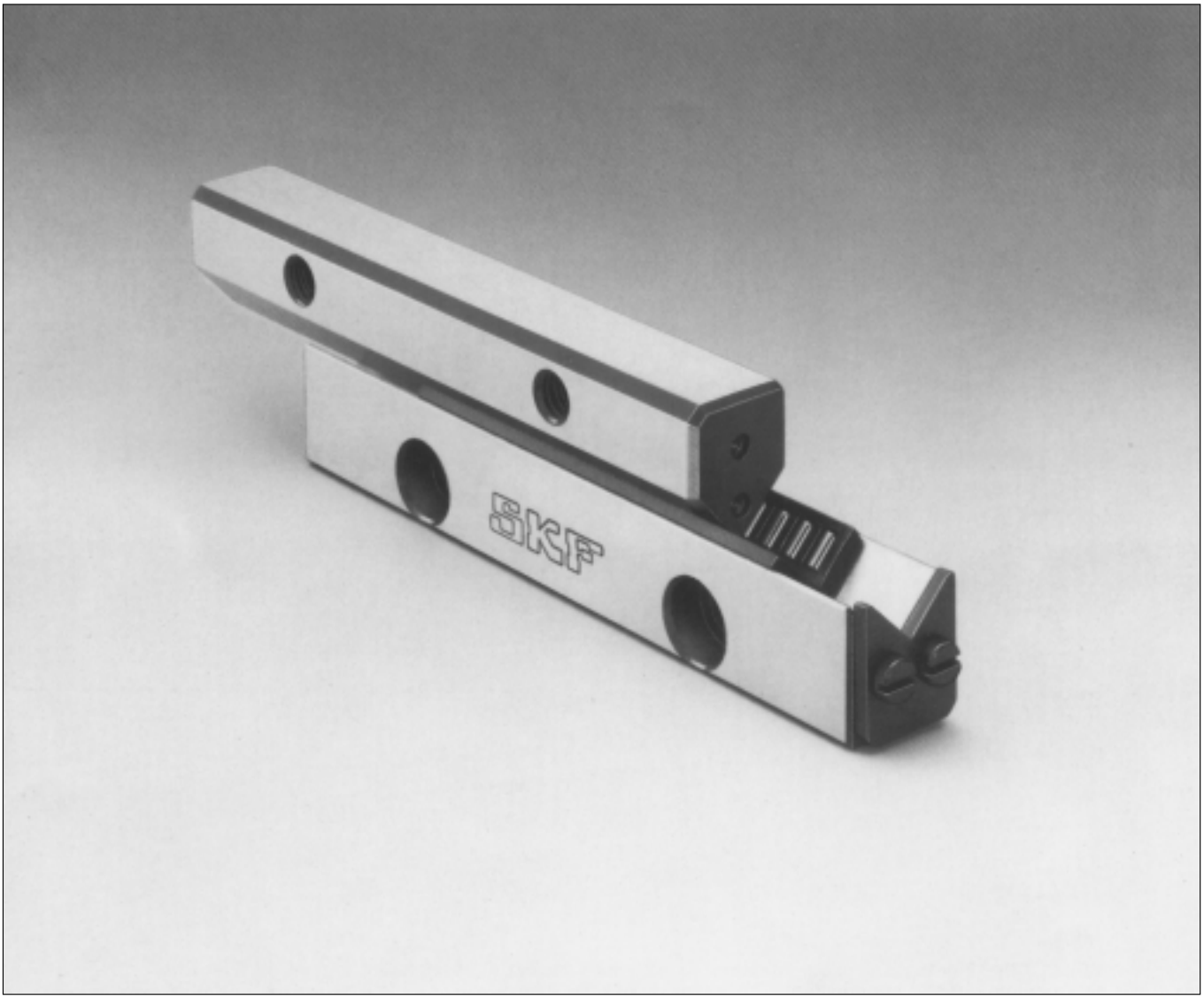
LWEARM and LWEARV end pieces are fitted with a plastic wiper with a sealing lip which serves to reduce the risk of contamination of the raceways.

All end pieces are supplied with the appropriate attachment screws.

The mounting and attachment dimensions of the LWRM/LWRV rail guides conform to those of all the SKF Modular Range rail guides included in this catalogue.

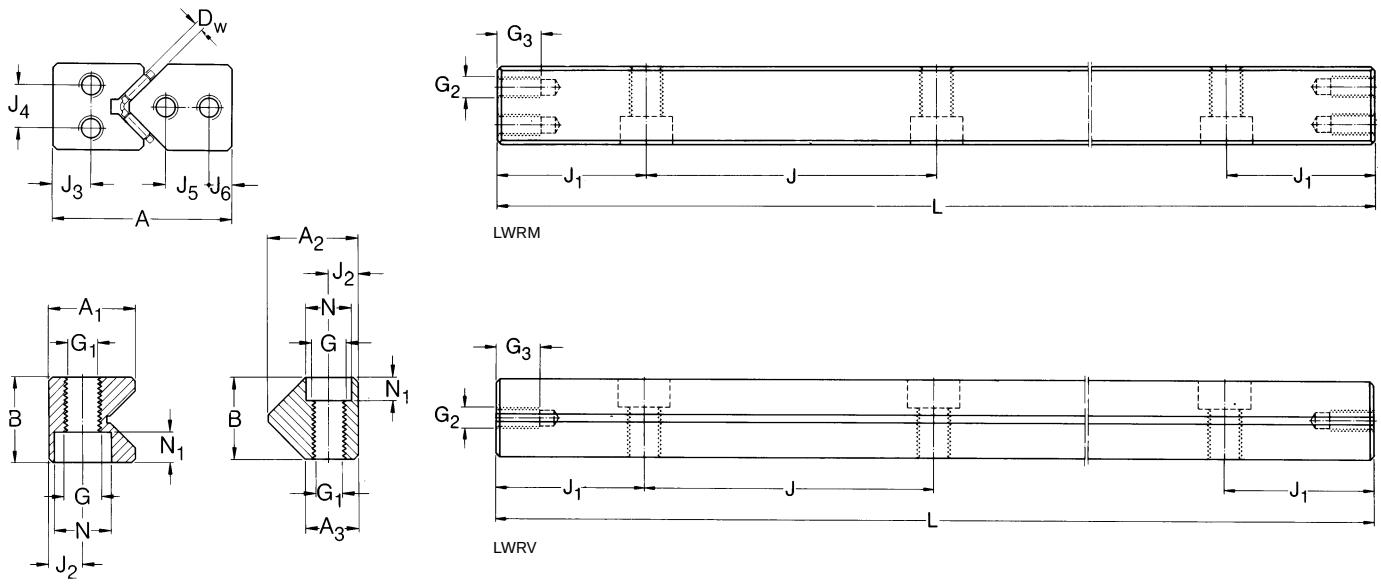
Because of the large number of possible combinations, all the component parts of LWRM/LWRV rail guides must be ordered separately, e.g:

2 rail guides LWRM 90400
2 rail guides LWRV 90400
2 needle roller assemblies
LWHW 15 x 358
2 end pieces LWERM 9



LWRM/LWRV rail guides

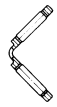
LWRM/LWRV 6 and LWRM/LWRV 9



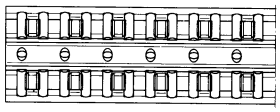
Designation[1]	Dimensions: System						Attachment holes							End face holes					
	A	B	A_1	A_2	A_3	D_w	J	J_1	J_2	G	G_1	N	N_1	J_3	J_4	J_5	J_6	G_2	G_3
	mm																		
LWRM 6	**31**	**15**	16,5	–	–	2	50	25	6	M 6	5,2	9,5	5,2	8,6	7	–	–	M 3	6
LWRV 6	**31**	**15**	–	17,8	10,8	2	50	25	6	M 6	5,2	9,5	5,2	–	–	7	6	M 3	6
LWRM 9	**44**	**22**	23,1	–	–	2	100	50	9	M 8	6,2	10,5	6,2	10	11	–	–	M 5	8
LWRV 9	**44**	**22**	–	26,9	16,6	2	100	50	9	M 8	6,2	10,5	6,2	–	–	10	6	M 5	8

[1] rails of designations LWRM/LWRV 12 and 15, and other lengths available to order
[2] needle roller assemblies with steel cages also available to order

Rolling element assemblies

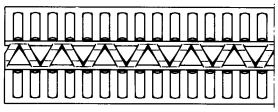


LWHW



Aluminium

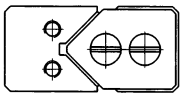
LWHV

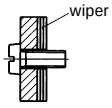


Plastics

End pieces

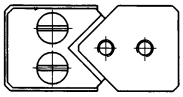
LWERV

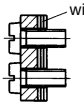




LWEARV
with wiper

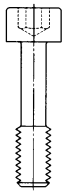
LWERM





LWEARM
with wiper

Sepcial assembly screw



LWGD

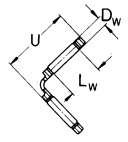
Available lengths L[1)]														Rolling element assemblies		End pieces				Sepcial assembly screws
100	150	200	250	300	350	400	500	600	700	800	900	1000		LWHV	LWHW	LWERM	LWEARM	LWERV	LWEARV	LWGD
⊡	⊡	⊡	⊡	⊡	o	⊡	o	o	o					•	–[2)]	•	•	–	–	•
⊡	⊡	⊡	⊡	⊡	o	⊡	o	o	o					•	–[2)]	–	–	•	•	•
		⊡		⊡		⊡	⊡	o	o	o	o	o		•	•	•	•	–	–	•
		⊡		⊡		⊡	⊡	o	o	o	o	o		•	•	–	–	•	•	•

⊡ **SKF Modular Range**
Preferred range, prompt delivery
• Prompt delivery
o To special order

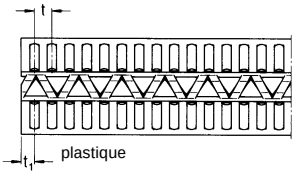
Ordering example: 2 LWRM 90600
2 LWRV 90600
2 LWHV x 450
4 LWERM 9

Accessories for LWRM/LWRV rail guides

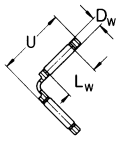
Needle roller assemblies



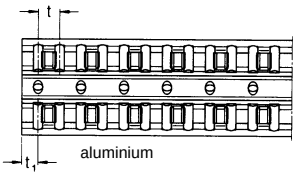
LWHV



plastique



LWHW



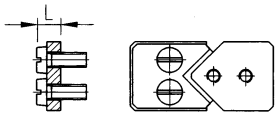
aluminium

For description and data on needle roller assemblies, please see page 25

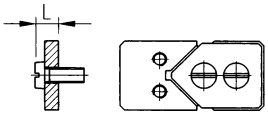
Designation	Dimensions					Load ratings for 10 needle rollers per row		Rail guide designation
	D_w	L_w	t	t_1	t_2	dynamic C	static C_0	
	mm					N		
LWHV 10	2	4,8	10	3,75	2,7	10 400	25 500	**LWRM 6/LWRV 6***
LWHV 15	2	7,8	15	3,75	2,7	16 300	45 000	**LWRM 9/LWRV 9**
LWHW 15	2	7,8	15	4,5	3,4	16 300	45 000	**LWRM 9/LWRV 9**

* needle roller assemblies with steel cages also available to order

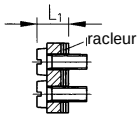
End pieces



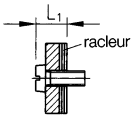
LWERM



LWERV

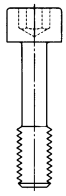


LWEARM



LWEARV

Special attachment screw


LWGD

for designation and dimnesions see page 19

Designation		Dimensions		Appropriate attachment screws		Rail guide designation
without wiper	with wiper	L	L_1			
		mm				
LWERM 6		4		M 3	DIN 84	**LWRM 6**
LWERV 6		4		M 3	DIN 84	**LWRV 6**
	LWEARM 6		6	M 3	DIN 84	**LWRM 6**
	LWEARV 6		6	M 3	DIN 84	**LWRV 6**
LWERM 9		6,3		M 5	DIN 84	**LWRM 9**
LWERV 9		6,3		M 5	DIN 84	**LWRV 9**
	LWEARM 9		8,3	M 5	DIN 84	**LWRM 9**
	LWEARV 9		8,3	M 5	DIN 84	**LWRV 9**

LWRPM/LWRPV rail guides

LWRPM/LWRPV rail guides are linear bearings for limited travel, with slideway liners made in Turcite-B®[1)].

This material, based on PTFE, is self-lubricating and possesses excellent sliding properties.

The dry sliding liner is attached to the unhardened LWRPM rail with adhesive and the surface is then ground. In order to avoid damage to the sliding surface, the leading edges of the LWRPV rails are slightly rounded. Dimensions of these rails are the same as those of the LWRV series. LWRPM/LWRPV rail guides should be used where, because of external influences, rail guides incorporating rolling element assemblies are unsuitable.

Such applications include those where high shock loads occur which could cause indentation of the rolling elements in the raceways, or where extremely short strokes are required. The unfavourable tribological conditions produced by such operation would give rise to raceway pitting in a rolling element rail guide.

The mounting and attachment dimensions of the LWRPM/LWRPV rail guides conform to those of all the SKF Modular Range rail guides included in this catalogue.

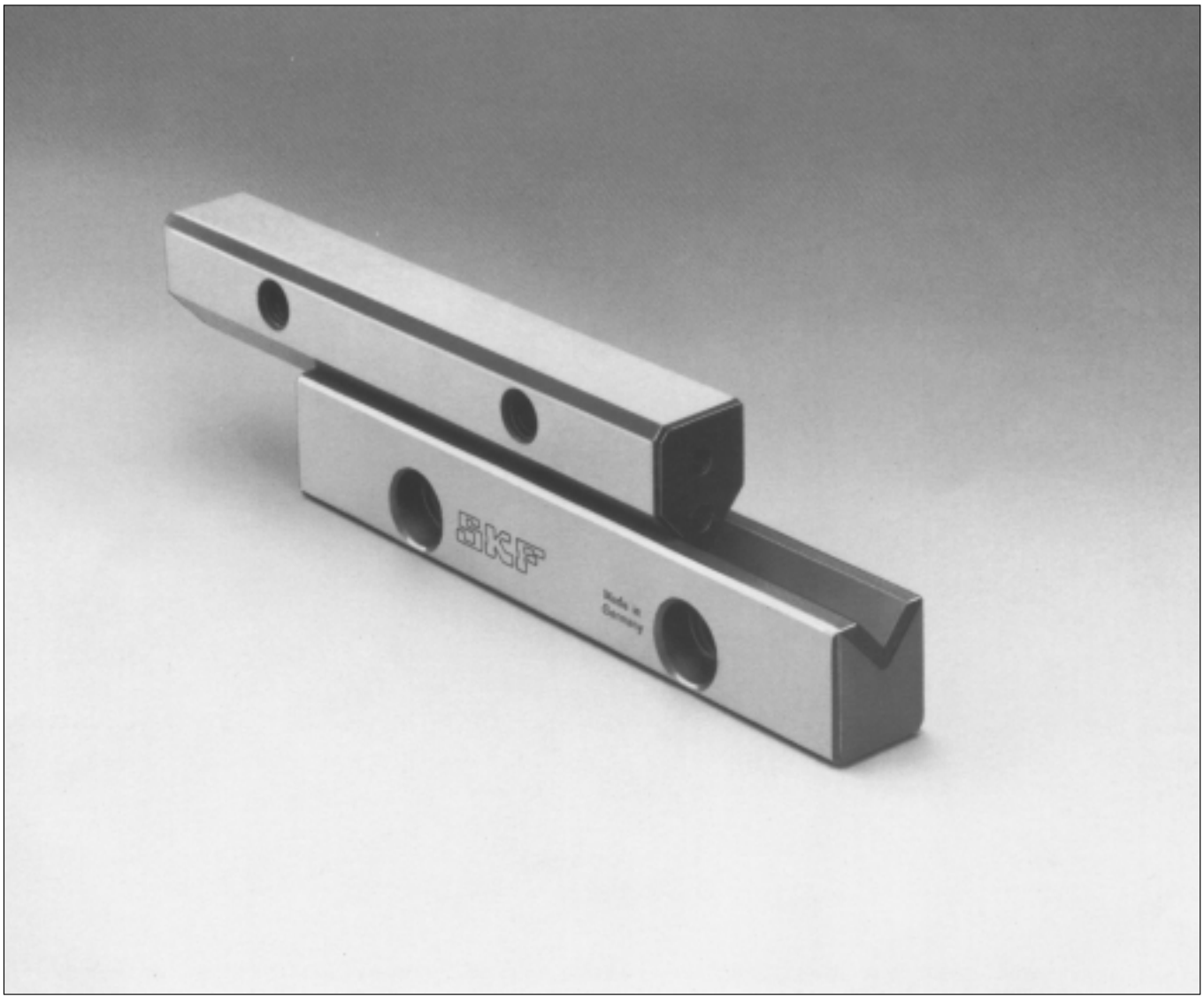
LWRPM/LWRPV rail guides are characterised by:

- stick-slip-free operation
- smooth running
- good emergency running properties
- low wear and high reliability
- insensitivity to contamination
- very good vibration damping properties

When ordering, the individual components of the rail guides should be specified, e. g:

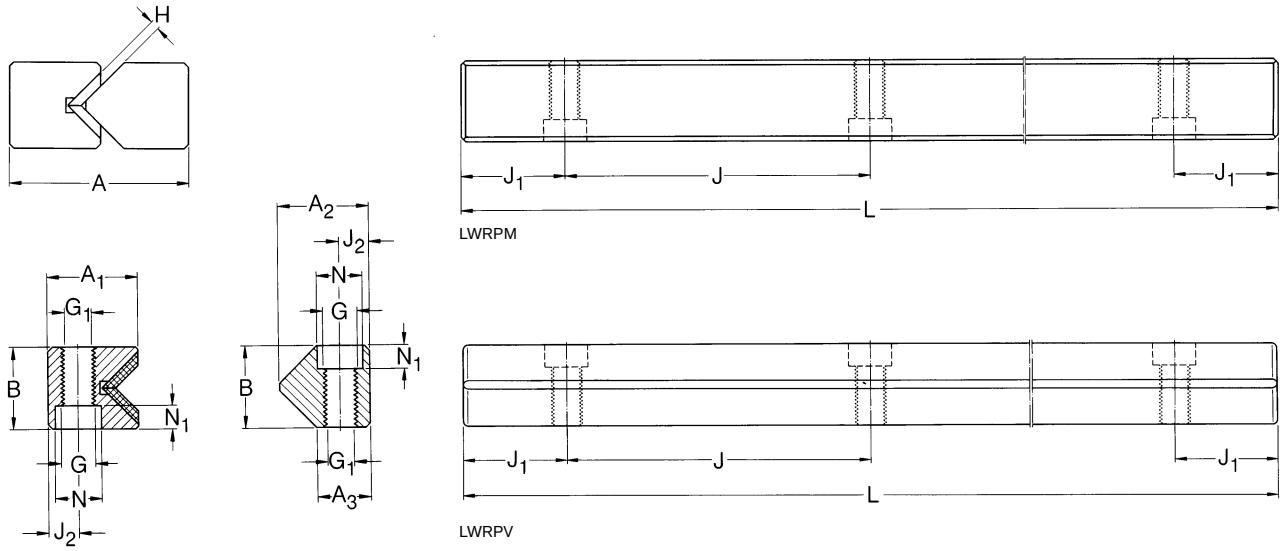
2 rails LWRPM 6300
2 rails LWRPV 6300

[1)] Turcite-B® is a registered trademark of Busak & Shamban GmbH



LWRPM/LWRPV rail guides

LWRPM/LWRPV 3 – LWRPM/LWRPV 9



Designation[1]	Dimensions: System					Attachment holes						
	A	B	A_1	A_2	A_3	J	J_1	J_2	G	G_1	N	N_1
	mm											
LWRPM 3	**18**	**8**	9,5	–	–	25	12,5	3,5	M 4	3,3	6	3,2
LWRPV 3	**18**	**8**	–	9,6	6,45	25	12,5	3,5	M 4	3,3	6	3,2
LWRPM 6	**31**	**15**	16,6	–	–	50	25	6	M 6	5,2	9,5	5,2
LWRPV 6	**31**	**15**	–	17,8	10,8	50	25	6	M 6	5,2	9,5	5,2
LWRPM 9	**44**	**22**	23,1	–	–	100	50	9	M 8	6,8	10,5	6,2
LWRPV 9	**44**	**22**	–	26,9	16,6	100	50	9	M 8	6,8	10,5	6,2

[1] sizes LWRPM/LWRPV 12 and LWRPM/LWRPV 15, also other rail lengths are available to order.

Slide liners

The raceways of LWRPM rail guides are provided with liners which are attached using adhesive and subsequently ground to size.

No special instructions are required for ordering the liner material.

For more information, see page 32.

End pieces

Because of their design, rail guides of these series do not normally require the use of end pieces.

Special attachment screws

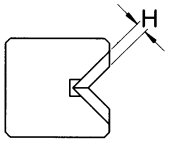
For designations and dimensions, see page 19.

	Available lengths L[1]																						Special attachment screws
	050	075	100	125	150	175	200	225	250	275	300	350	400	450	500	550	600	650	700	800	900	1000	LWGD
	⊡	⊡	⊡	⊡	⊡	⊡	⊡	o	o	o	o												•
	⊡	⊡	⊡	⊡	⊡	⊡	⊡	o	o	o	o												•
			⊡		⊡		⊡		⊡		⊡	o	⊡	o	•	o	o	o	o				•
			⊡		⊡		⊡		⊡		⊡	o	⊡	o	•	o	o	o	o				•
							⊡				⊡		⊡		⊡		o		o	o	o	o	•
							⊡				⊡		⊡		⊡		o		o	o	o	o	•

⊡ **SKF Modular Range**
Preferred range, prompt delivery
• Prompt delivery
o Tospecial order

Ordering example: 2 LWRPM 6400
2 LWRPV 6300

Accessories
for LWRPM/LWRPV rail guides



Designation[1]	Dimensions	Load carrying capacity[2]	Rail guide designation
	H	C	
	mm	N	
LWRPM 3	0,7	300/100 mm	**LWRPV 3**
LWRPM 6	1,7	700/100 mm	**LWRPV 6**
LWRPM 9	1,7	1200/100 mm	**LWRPV 9**

1) The sliding liners are parts of the LWRPM and do not require a special order.
2) for a surface loading of approx. 1 N/mm^2
(momentary loads of up to 6 N/mm^2 are permissible).

End pieces

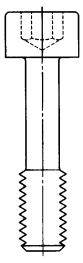
LWRPM/LWRPV rail guides, by virtue of their design,
do not normally require end pieces.

For this reason, tapped holes on the end faces are also unnecessary.

However, for production reasons,
LWRPV rail guides will in certain cases be supplied with end face tapped holes.

Special attachment screws

See page 19 for designations and dimensions.



LWGD

LWW/LWV rail guides

LWW/LWV rail guides enable the design of linear guidance systems for heavy loads with maximum stiffness. The internal geometry is identical with that of the **Modular Range** rails of the LWRM/LWRV series. As the same needle roller assembly is used, the load bearing characteristics are also the same. The external dimensions of the LWM/LWV rail guides, however, differ slightly from those of the LWRM/LWRV Modular Range dimensions.

LWM/LWV rail guides find wide application in machine tools.

LWM/LWV rail guides have as standard attachment hole type 15, i.e. through hole with countersinking.

If attachment hole type 13 is ordered, corresponding threaded inserts are supplied along with the guide.

For new designs the choice of LWRM/LWRV rail guides is recommended. These offer the advantage of being interchangeable with other rail guides of the Modular Range.

Needle roller assemblies for LWM/LWV rail guides

LWHV needle roller assemblies have a plastic cage with retained needle rollers. The elastic connection between the two cage sections for the two roller rows enables the cage to bend to any angle.

LWHW needle roller assemblies comprise an aluminium cage with needle rollers arranged at right angles to each other. The needle rollers are retained by the cage.

End pieces for LWM/LWV rail guides

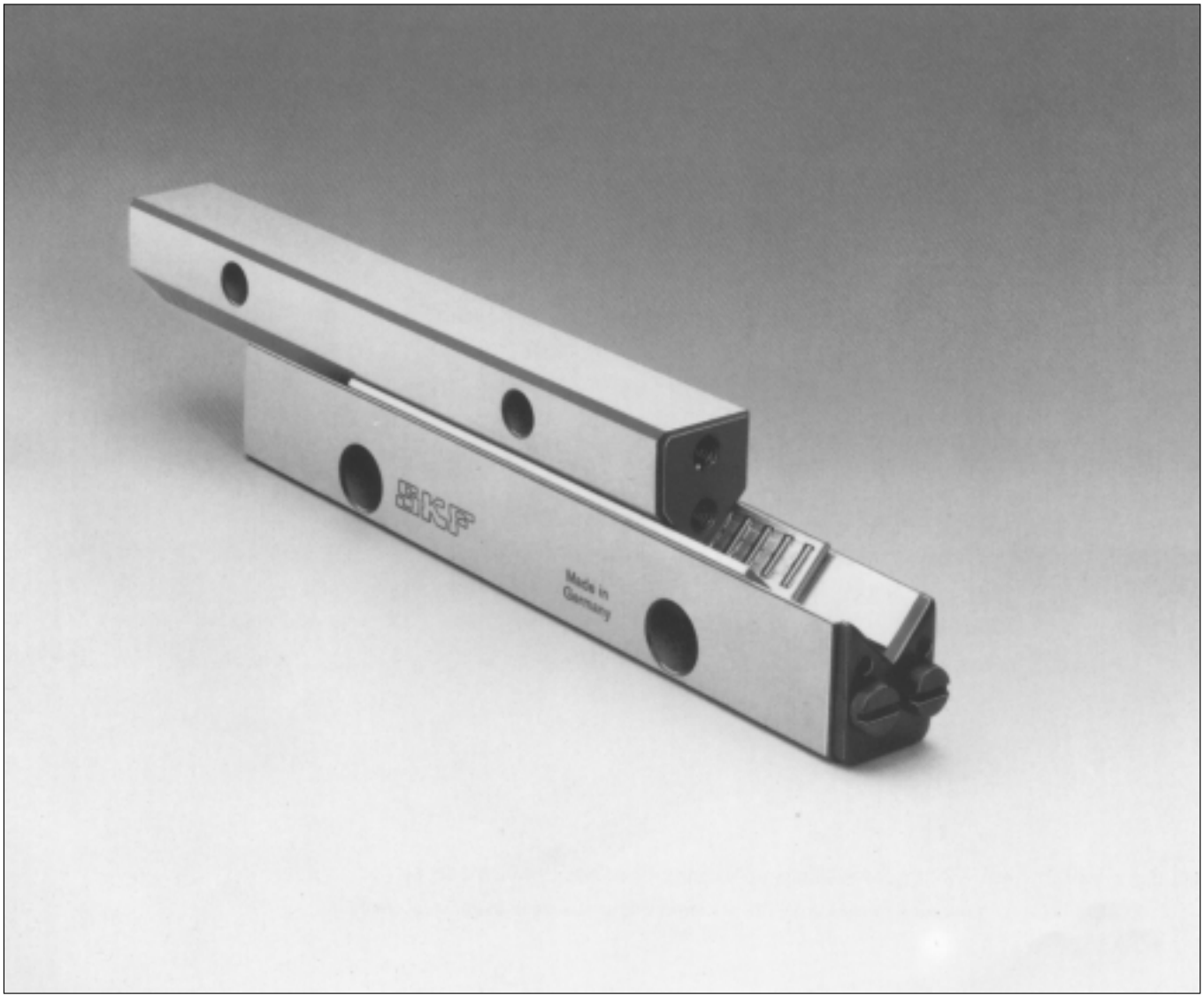
End pieces serve to prevent drift of the cage away from the loaded zone.

LWEM- and LWEV end pieces are suitable for horizontally and vertically mounted rail guides.

LWEAM and LWEAV end pieces have the addition of a plastic wiper with a sealing lip which serves to keep the track tree from dirt.

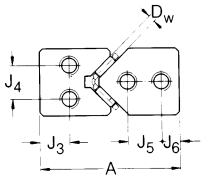
All end pieces are supplied together with attachment screws.

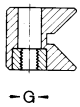
Rail guides with a length of more than 1200 mm should be made up of sections. If, for design reasons, single-pieces rails are required, these can be supplied to special order.



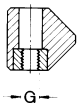
LWM/LWV rail guides

LWM/LWV 3015 – LWM/LWV 8050

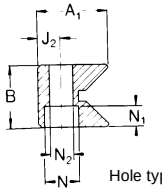




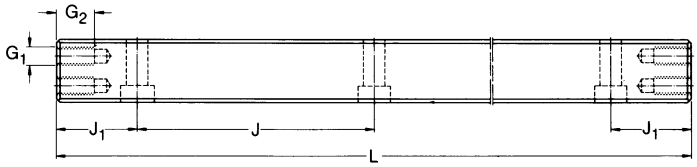
Hole type 13



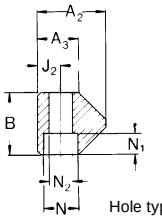
Hole type 13



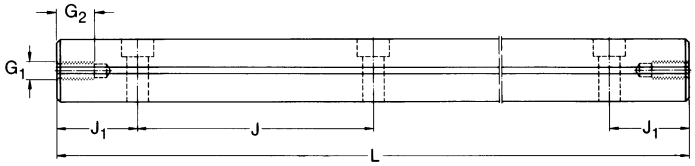
Hole type 15



LMW rail



Hole type 15



LWV rail

Designation	Dimensions: System						Attachment holes							End face holes					
	A	B	A_1	A_2	A_3	D_w	$J^{1)}$	$J_{1\,min}{}^{2)}$	J_2	G	N	N_1	N_2	J_3	J_4	J_5	J_6	G_1	G_2
	mm																		
LWM 3015	**30**	**15**	16	–	–	2	40	15	5,5	M 4	8,5	4,5	5,25	8	7	–	–	M 3	6
LWV 3015	**30**	**15**	–	17,2	10,5	2	40	15	5,5	M 4	8,5	4,5	5,25	–	–	7	5,5	M 3	6
LWM 4020	**40**	**20**	22,5	–	–	2	80	15	7,5	M 6	11,5	6,8	7,5	10	11	–	–	M 5	7
LWV 4020	**40**	**20**	–	22	13,5	2	80	15	7,5	M 6	11,5	6,8	7,5	–	–	10,5	5,5	M 5	7
LWM 5025	**50**	**25**	28	–	–	2	80	20	10	M 6	11,5	6,8	7,5	12	13	–	–	M 6	8
LWV 5025	**50**	**25**	–	28	17	2	80	20	10	M 6	11,5	6,8	7,5	–	–	13	7	M 6	8
LWM 6035	**60**	**35**	36	–	–	2,5	100	20	11	M 8	15	9	10	14	20	–	–	M 6	8
LWV 6035	**60**	**35**	–	36	120	2,5	100	20	11	M 8	15	9	10	–	–	18	8	M 6	8
LWM 7040	**70**	**40**	40	–	–	3	100	20	13	M 10	18,5	11	12,5	16	20	–	–	M 6	8
LWV 7040	**70**	**40**	–	42	24	3	100	20	13	M 10	18,5	11	12,5	–	–	20	10	M 6	8
LWM 8050	**80**	**50**	45	–	–	3,5	100	20	14	M 12	20	13	14	20	30	–	–	M 6	8
LWV 8050	**80**	**50**	–	48,5	26	3,5	100	20	14	M 12	20	13	14	–	–	25	10	M 6	8

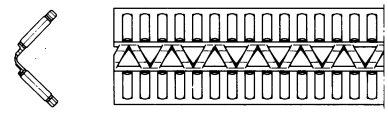
1) for lengths $L < J + 2 \cdot J_{1\,min}/J = 50$ mm (except for LWM/LWV 3015)

2) J_1 depends upon the rail length and is of the same size at each end of the rail

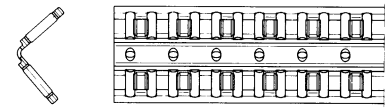
$$J_1 = \frac{L - \sum J}{2}$$

3) J = 35 mm

Rolling element assemblies

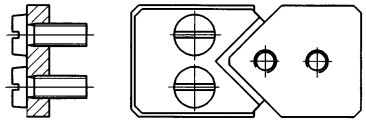


LWHV Plastics

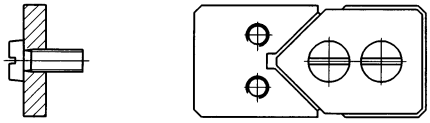


LWHW Aluminium

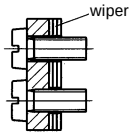
End pieces



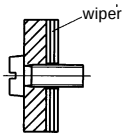
LWEM



LWEV



LWEAM with wiper



LWEAV with wiper

Available lengths[4]											Needle roller assemblies		End pieces			
100	150	200	300	400	500	600	700	800	900	1000	LWHV	LWHW	LWEM	LWEAM	LWEV	LWEAV
•[3]	•	•	•	•	o	o					•	o[5]	•	•		
•[3]	•	•	•	•	o	o					•	o[5]			•	•
•	•	•	•	•	o	o	o	o	o	o	•	•	•	•		
•	•	•	•	•	o	o	o	o	o	o	•	•			•	•
•		•	•	•	•	o	o	o	o	o	•	•	•	•		
•		•	•	•	•	o	o	o	o	o	•	•			•	•
		o	o	o	o	o	o	o	o	o	•	•	o	o		
		o	o	o	o	o	o	o	o	o	•	•			o	o
		o	o	o	o	o	o	o	o	o	o	•	o	o		
		o	o	o	o	o	o	o	o	o	o	•			o	o
		o	o	o	o	o	o	o	o	o	o	•	o	o		
		o	o	o	o	o	o	o	o	o	o	•			o	o

[4] other lengths available to order

[5] also available with steel cage to order

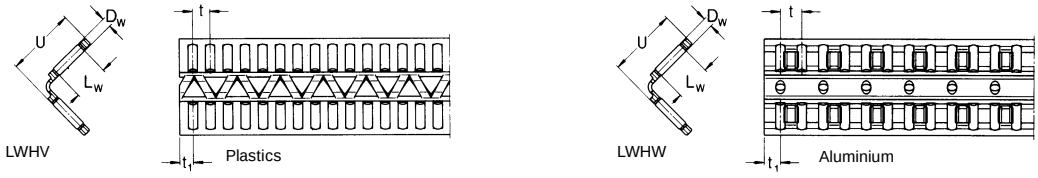
• available from stock

o available to order

Ordering example:
2 LWM 402000
2 LWV 4020200
2LWHW 15 x 130
4 LWEAM 4020

Accessories for LWM/LWV rail guides

Needle roller assemblies

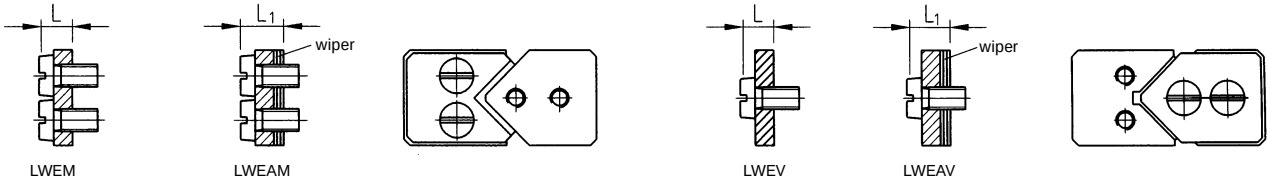


For description and data on crossed roller assemblies, please see page 33.

Designation	Dimensions					Load ratings for 10 needle rollers per row		Rail guide designation
	D_w	L_w	U	t	t_1	dynamic C	static C_0	
	mm	N						
LWHV 10	2	4,8	10	3,75	2,7	10 400	25 500	**LWM/LWV 3015***
LWHV 15	2	7,8	15	3,75	2,7	16 300	45 000	**LWM/LWV 4020 + 5025**
LWHW 15	2	7,8	15	4,5	3,4	16 300	45 000	**LWM/LWV 4020 + 5025**
LWHV 20	2,5	11,8	20	5	3,7	32 000	88 000	**LWM/LWV 6035**
LWHW 20	2,5	11,8	20	5,5	4,2	32 000	88 000	**LWM/LWV 6035**
LWHW 25	3	15,8	25	6	4,4	52 000	143 000	**LWM/LWV 7040**
LWHW 30	3,5	20	30	7	5,2	76 500	212 000	**LWM/LWV 8050**

* needle roller assemblies with steel cages also available for this size

End pieces



Designation		Dimensions		Appropriate attachment screws
without wiper	with wiper	L	L_1	
		mm		
LWEM 3015		4		M 3 DIN 84
LWEV 3015		4		M 3 DIN 84
	LWEAM 3015		6	M 3 DIN 84
	LWEAV 3015		6	M 3 DIN 84
LWEM 4020		6,3		M 5 DIN 84
LWEV 4020		6,3		M 5 DIN 84
	LWEAM 4020		8,3	M 5 DIN 84
	LWEAV 4020		8,3	M 5 DIN 84
LWEM/LWEV 5025 à 8050		6,9		M 6 DIN 84
	LWEAM/LWEAV 5025 to 8050		8,9	M 6 DIN 84

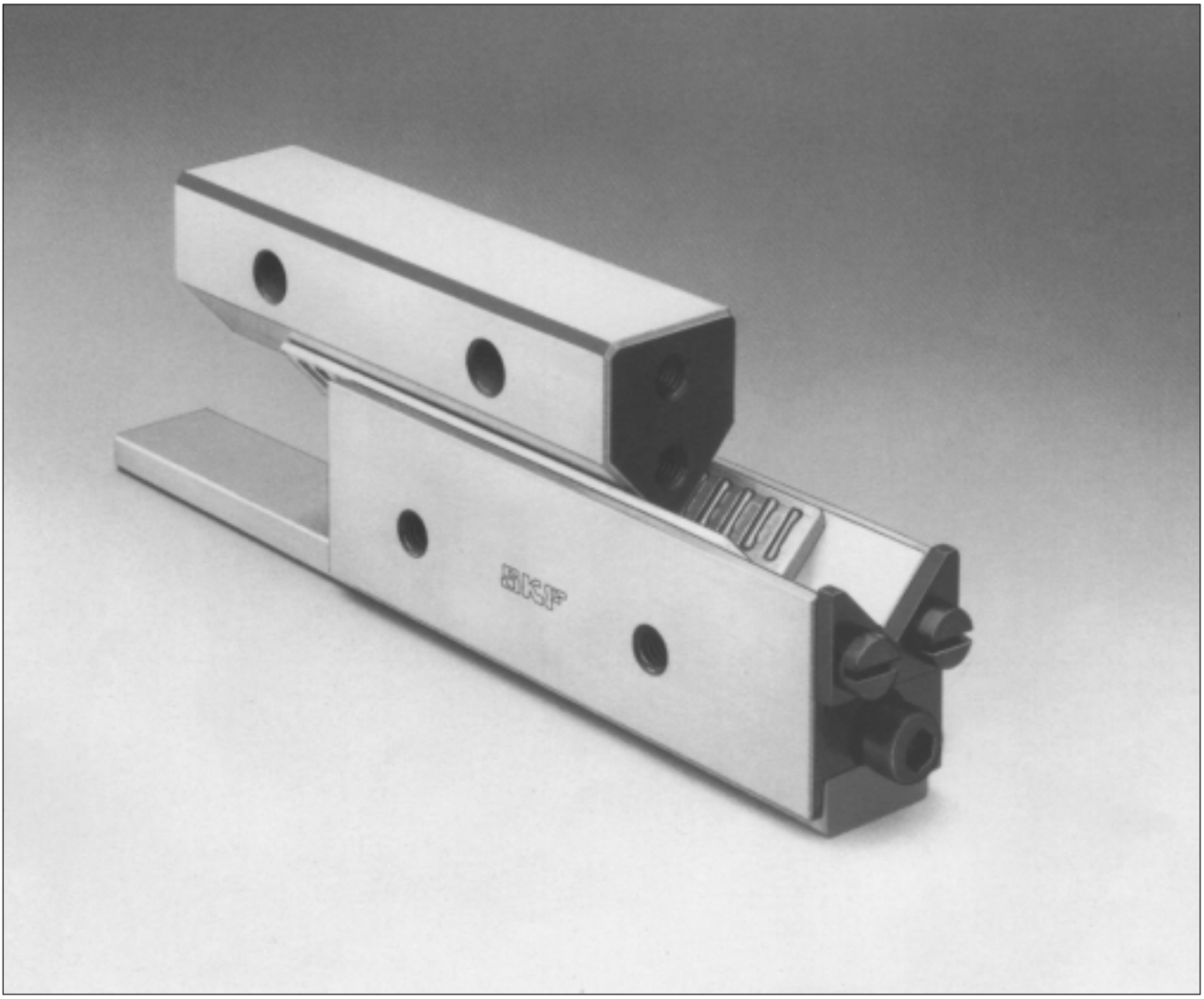
LWML rail guides

LWML rail guides consists of a modified LWM rail guide with the addition of an adjustment wedge. In conjunction with an LWV rail guide and a needle roller assembly this results in an adjustable linear guidance system. The wedge has a slope of 1,5 % so that a displacement of the wedge by 1 mm brings about a 15 µm alteration in height.

LWML rails are supplied as standard with hole type 15, i.e. through bored and countersink or hole type 13, i.e. with threaded insert. They are available to tolerance classes P10 and P5. Multi-section rails cannot be supplied.

LWML rails with the appropriate needle roller assemblies and end pieces are available to order.

I should also be stated at the time of ordering whether the mounting holes are required for right-hand or left-hand mounting.



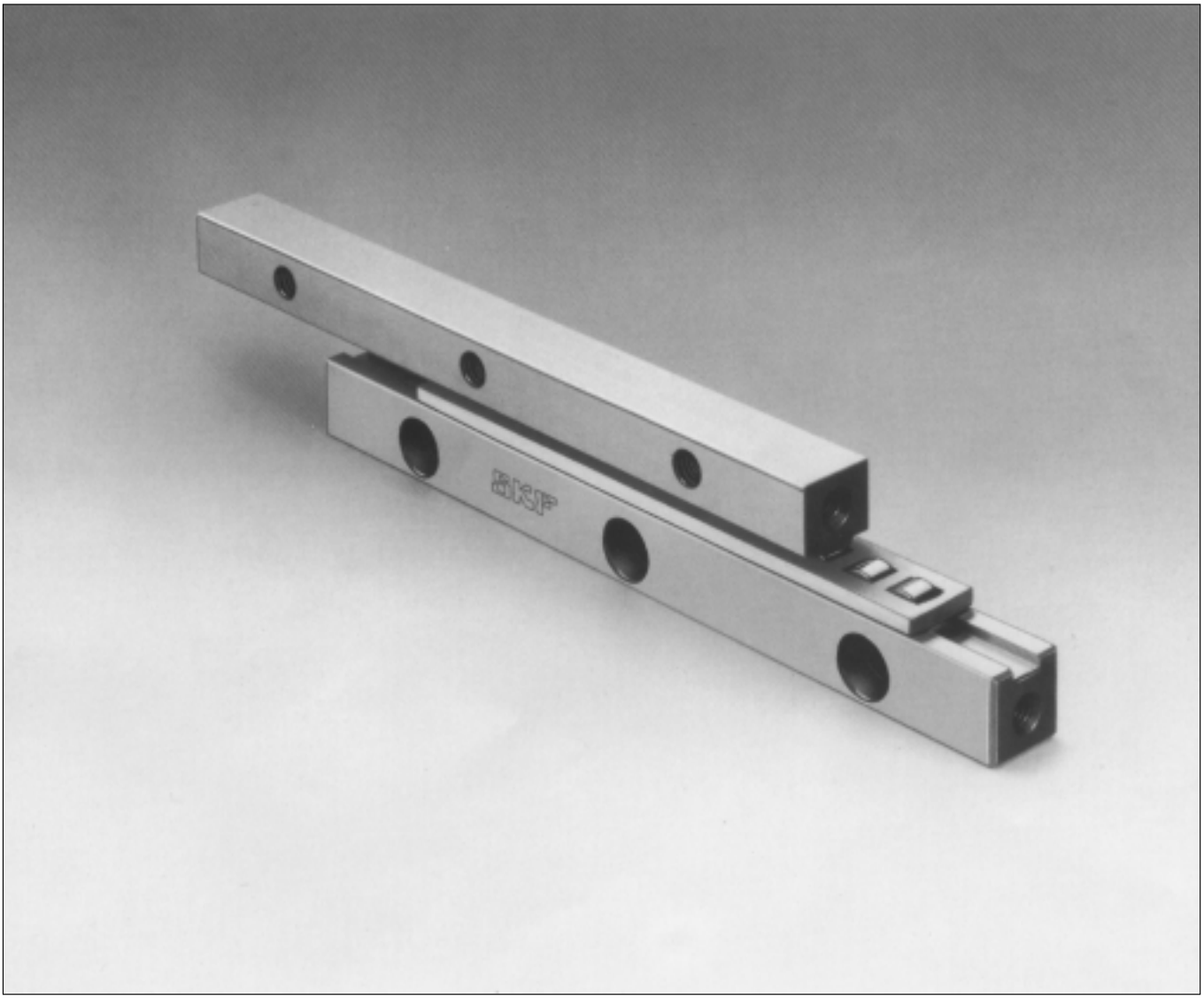
LWN/LWO rail guides

LWN/LWO rail guides differ from the LWM/LWV rail guides only in height, width and attachment holes. The internal geometry of the two series is the same and their load ratings are identical.

LWN/LWO rail guides are supplied to tolerance P10, P5 and P2 to order.

LWW/LWZ flat rail guides

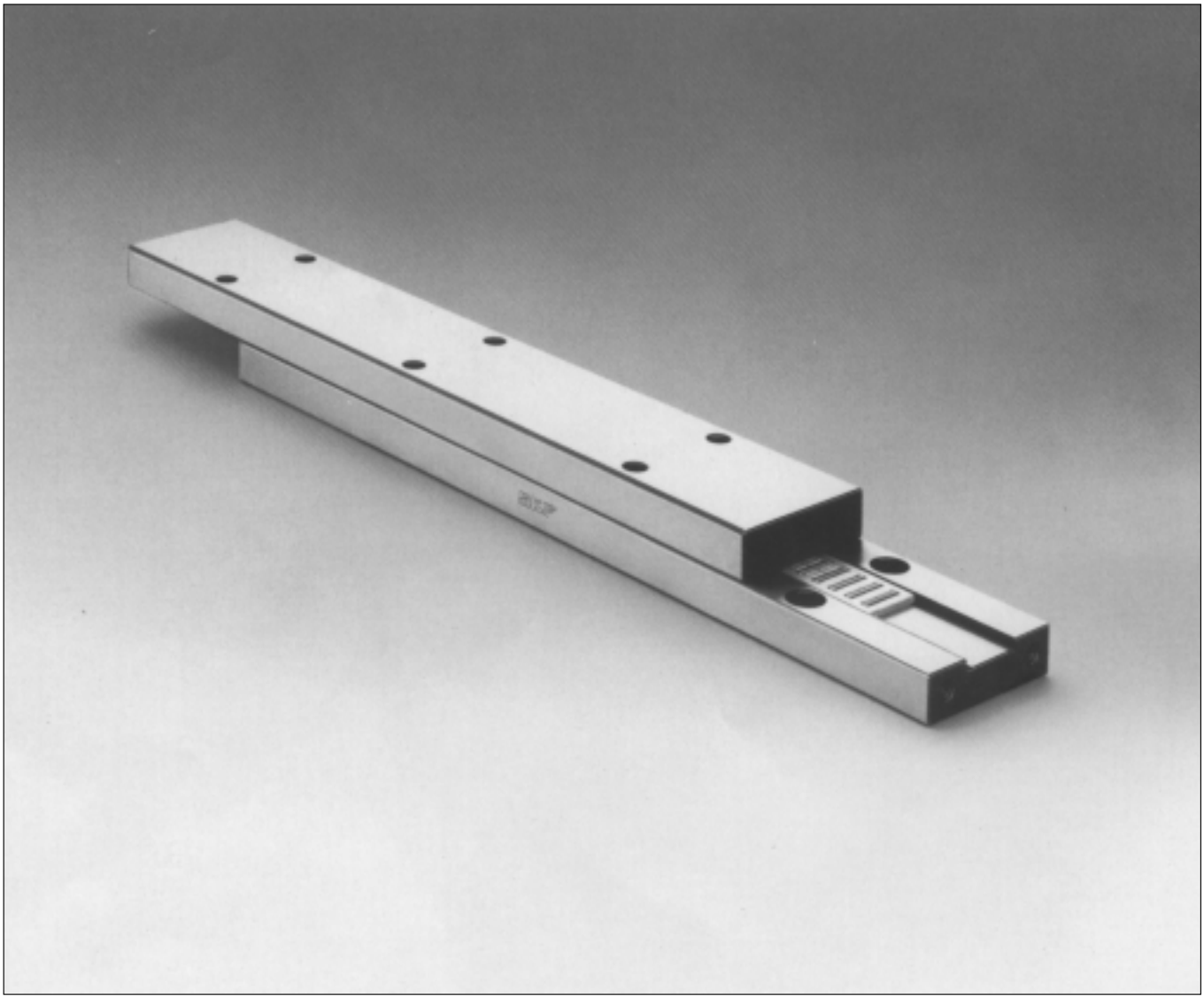
LWW/LWZ flat rail guides are used in conjunction with LWR rail guides in the construction of roller tables. These guides, with appropriate rolling element assemblies and end pieces are available to order.



LWJ/LWS flat rail guides

LWJ/LWS flat rail guides are used in combination with LWRM/LWRV, LWM/LWV or LWN/LWO as non-locating rail guide assemblies in the construction of linear slides.

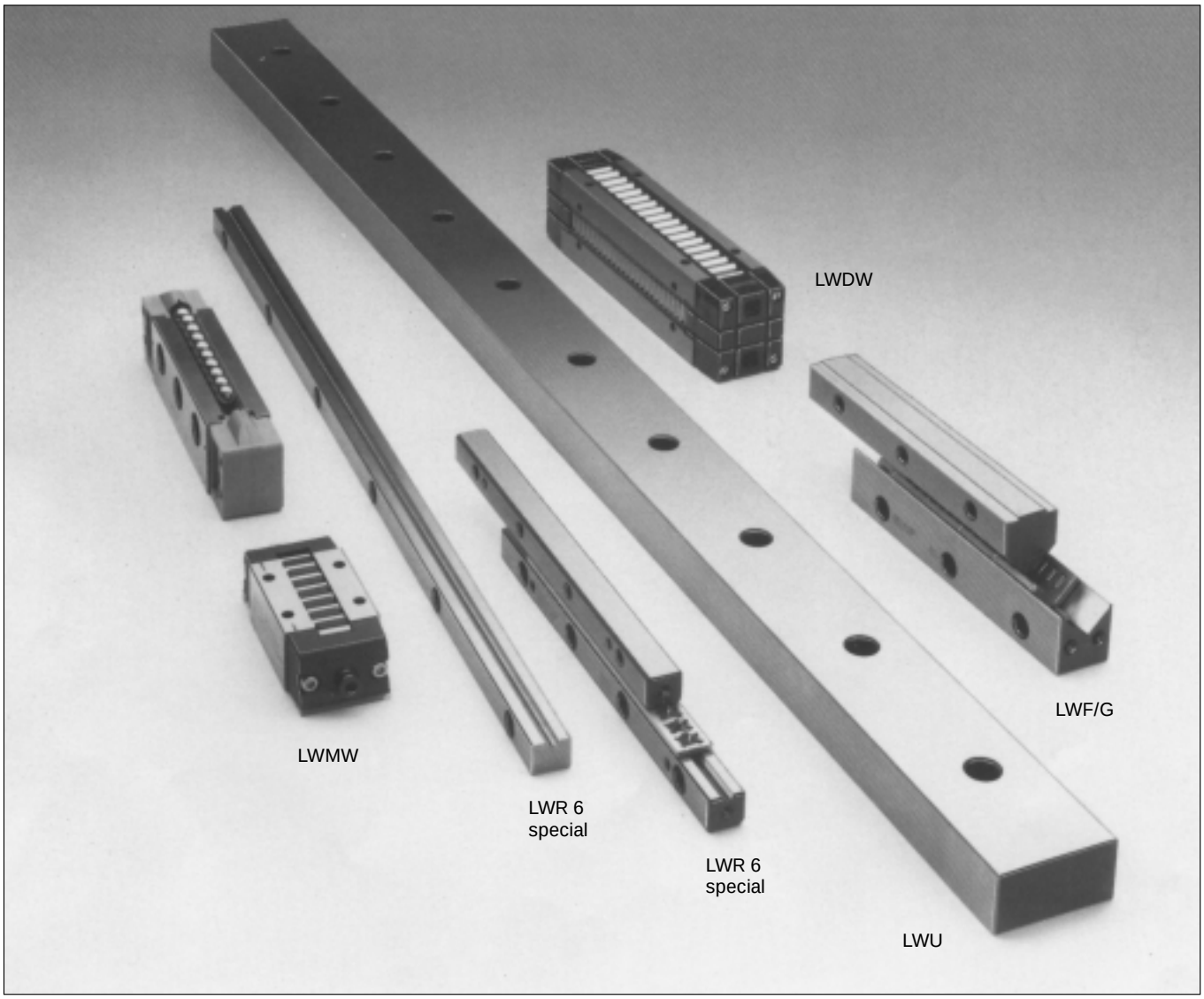
LWJ/LWS flat rail guides with appropriate rolling element assemblies and end pieces are available to order.



Special rail guides and recirculating roller assemblies

In addition to the standard rail guides included in this catalogue, SKF also supplies flat rail guides for recirculating roller assemblies, also rail guides to customers' own drawings, for instance for machine tool applications, handling systems and robotics.

Further information on special rail guides and recirculating roller assemblies and their availability will be supplied on request.



SKF sales companies

Australia
SKF AUSTRALIA PTY. LTD
P. O. Box 301
OAKLEIGH, Victoria 3166
Phone: + 61 (3) 5 67 28 00
Fax: + 61 (3) 5 67 28 88

Austria
SKF ÖSTERREICH AG
IKANO Bürogebäude
Postfach 87
A-2355 WIENER NEUDORF
Phone: + 43 (22 36) 6 70 90
Fax: + 43 (22 36) 6 70 92 20

Benelux
SKF MULTITEC BENELUX B. V.
Kelvinbaan 16
NL-3439 MT Nieuwegein
Phone: + 31 306 029 029
Fax: + 31 306 029 028
Phone: (B) + 32 2 5024270
Fax: (B) + 32 2 5027336

Canada
SKF CANADA LIMITED
40 Executive Court
SCARBOROUGH, ONTARIO
MIS 4 N 4
Phone: + 1 (4 16) 2 99 12 20
Fax: + 1 (4 16) 2 92 03 99

Czech Republic
SKF LOŽISKA A.S.
P. O. Box 19
U Měšťánského pivovaru 7
17004 PRAHA 7
Phone: + 420 (0)2 66 19 71 11
Fax: + 420 (0)2 66 71 04 15

Denmark
SKF MULTITEC
Bramdrupskovvej 17
DK-6000 KOLDING
Phone: + 45 - 75 52 95 77
Phone: + 46 - 42 25 35 00
Fax: + 45 - 75 52 95 66

Finland
SKF MULTITEC
PL 60
FIN-02201 ESPOO
Phone: + 3 58 94 52 97 54
Fax: + 3 58 94 27 76 5

France
SKF EQUIPEMENTS
30/32 Ave. Des Trois Peuples
B. P. 83
F-78185 SAINT QUENTIN
Yvelines Cedex
Phone: + 33 (1) 30 64 28 28
Fax: + 33 (1) 30 64 41 31

Germany
SKF LINEARSYSTEME GMBH
Verkauf Deutschland
Hans-Böckler-Straße 6
97424 SCHWEINFURT
Phone: + 49 (97 21) 6 57 - 0
Fax: + 49 (97 21) 6 57 - 111

Great Britain
SKF ENGINEERING PRODUCTS LTD.
Sundon Park Road
Luton
BEDFORDSHIRE LU3 3BL
Phone: + 44 (15 82) 49 0049
Fax: + 44 (15 82) 49 6574

Hong Kong
SKF CHINA LIMITED
Unit A 35/F. Manulife Tower
169 Electric Road · North Point
HONG KONG
Phone: + 852 - 25 10 81 11
Fax: + 852 - 25 10 73 68

Hungary
SKF SVÉD GOLYÓSCSAPÁGY
RESZVENYTARSASAG
Csata u. 25
HU-2040 BUDAÖRS
Phone: + 36 (23) 41 59 96
Fax: + 36 (23) 41 59 28

Italy
SKF MULTITEC S.p. A.
Corso Vittorio Emanuele II, 94
I-10121 TORINO
Phone: + 39 (011) 57 17 61
Fax: + 39 (011) 5 71 76 33

Norway
SKF MULTITEC A/S
Jerikoveien 14
1067 OSLO
Postal address: Postboks 7
Lindeberg Gård
N-1007 OSLO 10
Phone: + 47 (2) 2 30 71 70
Fax: + 47 (2) 2 30 28 14

Poland
SKF CENTRALA HANLOWO-
TECHNICZNA SP. ZO.O.
ul. Pulawska 303
02-785 WARSZAWA
Phone: + 48 22 549 4700
Fax: + 48 22 549 4701

Portugal
SKF PORTUGAL · Rolamentos Lda.
Casal de Alfragide, Lote 1,
AMADORA
Postal address: Apartado 60141,
P-2700 AMADORA
Phone: + 35 (1) 4 17 36 36
Fax: + 35 (1) 4 17 36 49 (general)
4 17 36 50 (sales)

Sweden
SKF MULTITEC AB
Ekslingan 3
HELSINGBORG
Postal address: Box 222 48
S-25024 HELSINGBORG
Phone: + 46 (42) 25 35 00
Fax: + 46 (42) 25 35 45, 25 35 46

Singapore
SKF SOUTH EAST ASIA &
PACIFIC PTE. LTD.
153 Gul Circle Jurong
Singapore 629610
Postal Address:
Jurong Point P. O. Box 445
SINGAPORE 916415
Phone: + 65 - 8 61 69 22
Fax: + 65 - 8 61 10 11

Spain
SKF PRODUCTOS INDUSTRIALES S.A.
Apartado 769
E-08080 BARCELONA
Phone: + 34 (93) 3 77 99 77
Fax: + 34 (93) 4 74 20 39/31 56

Switzerland
SKF (SCHWEIZ)
Eschenstraße 5
CH-8603 SCHWERZENBACH
Phone: + 41 (1) 8 25 81 81
Fax: + 41 (1) 8 25 82 82

USA
SKF MOTION TECHNOLOGIES
1530 Valley Center Parkway
USA-BETHLEHEM, PA 18017
Phone: + 1 (610) 861 - 4800
Fax: + 1 (610) 861 - 4811

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SKF Linear Motion offers a wide range of precision engineered linear motion components, units and systems. In addition to comprehensive product literature and software, SKF offers assistance from experienced linear motion engineers.

Linear Motion has **3 product lines** and a sales organisation based on **11 specialized sales companies** located in Europe and in the USA.

However the product availability as well as the product application is **world-wide granted by the SKF Bearing international network**. To get any other SKF address all over the world, please contact one of the companies below.

Austria
Linear Motion
SKF Österreich AG
Phone: +43 22 36 6709-0
Fax: +43 22 36 6709-220

Benelux
SKF Multitec Benelux B.V.
Phone: +31 30 6029029
Fax: +31 30 6029028

Sales Office Belgium/Luxembourg:
Phone: +32 2 5024270
Fax: +32 2 5027336

France
SKF Equipments
Phone: +33 1 30 64 28 28
Fax: +33 1 30 64 41 31

Germany
SKF Linearsysteme GmbH
Phone: +49 9721 657-0
Fax: +49 9721 657-111

Italy
SKF Multitec S.p. A.
Phone: +39 11 57 17 61
Fax: +39 11 5 71 76 33

Norway
SKF Multitec A/S
Phone: +47 22 30 71 70
Fax: +47 22 30 28 14

Spain
SKF Productos Industriales, S.A
Phone: +34 93 377 99 77
+34 93 377 99 07
Fax: +34 93 474 20 39/31 56

Sweden/Denmark/Finland
SKF Multitec
Phone: +46 42 25 35 00
Fax: +46 42 25 35 45/46

Sales Office Denmark
Phone: +45 75 51 95 77
Fax: +45 75 51 95 66

Sales Office Finland
Phone: +358 94 52 97 52
Fax: +358 942 77 65

United Kingdom
SKF Engineering Products Ltd.
Phone: +44 1582 490049
Fax: +44 1582 496574

USA
SKF Motion Technologies
Phone: +1 610 861-4800
Fax: +1 610 861-4811

http://www.linearmotion.skf.com

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