

IBC



Easy-Runner

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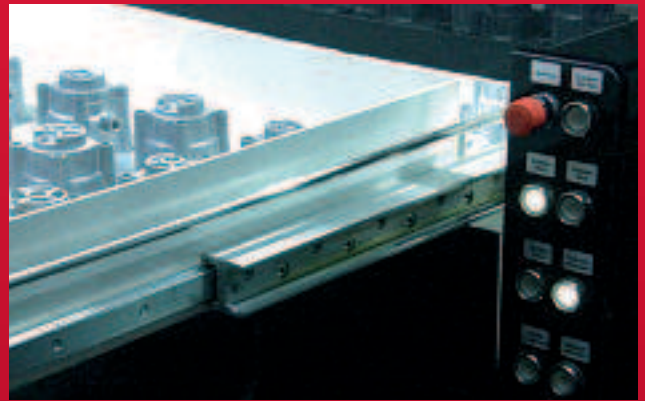
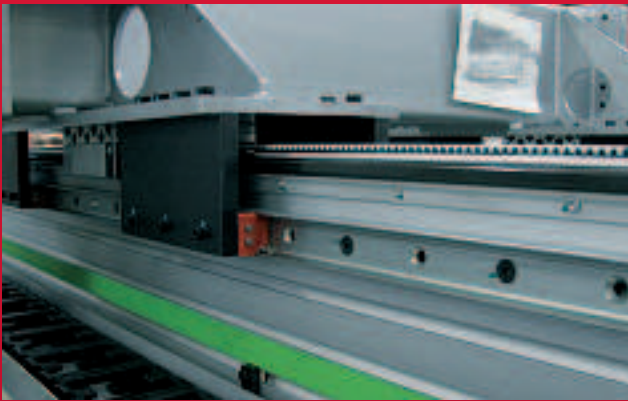


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1. Introduction

IBC Wälzlager GmbH, Industrial Bearings and Components, is proud to continue in the tradition of Robert Kling Wetzlar GmbH, a company founded in 1918. IBC is widely known for producing high precision rolling bearings that are used in machine tools, separators, centrifuges, compressors, gear boxes, printing machines, textile machines and high speed units. IBC, founded in 1972, is also a brand in the field of drive engineering, special-purpose mechanical engineering and general mechanical engineering. The company's distinguishing features are its efficient and high-precision production of small and medium sized batches and its innovative realisation of a customer's solutions.

IBC started its **Linear Guidance Systems** division to complement the well known and time-tested range of rotational rolling bearings. By continuously developing and improving its product range, IBC has evolved into one of the leading manufacturers of linear motion bearings and telescopic linear motion bearings. IBC produces **linear motion bearings** that are guided in rails that have an X- or U-profile and an internal raceway. This technology allows for very compact and space-saving systems. The most common choices are the **"Telescopic-Runner" telescopic linear motion bearings**, the **"Easy-Runner" linear ball bearings**, and the **track roller linear guidance systems**. Typical uses include the housings of machine tools as well as telescopic pullouts, e.g. those used in the railway supply industry, in medical technology and in warehouse logistics.

IBC offers a broad range of standard products. Since we operate our own production facilities in Germany, we are also in the position to respond to customers' wishes very speedily and flexibly, supplying you with sophisticated products that meet all the required efficiency demands. By way of example, the very smooth run, durability and precise positioning of our linear guides will enable you to design environmentally friendly and energy-saving solutions.

The brochure you are now viewing provides a detailed overview of **"Easy-Runner" linear motion bearings**.

You will find detailed information on the **"Telescopic-Runners"** in our brochure **TI-I-7005**.

We would also like to draw your attention to our series of **track roller linear guidance systems** (see fig. 1.1 for an example).

IBC track roller linear guidance systems are long-lasting and economical and show their strength in routine, everyday situations where machine parts or manually handled parts need to be smoothly moved either by hand or automatically, and heavy weights need to be guided precisely and in an energy-efficient way.

Compared to the **"Telescopic-Runner"** telescopic linear motion bearings and the **"Easy-Runner"** linear ball bearings, the **track roller linear guidance systems** with their roller-based carriers are able to realise much longer distances. Wipers and seals ensure that the closed carriers are resistant to any kind of contamination. As the rail guide is available both as a locating and a floating bearing system, designs are able to provide a structurally defined support and continue to function steadily in the event of changes in tolerance, temperature or in the direction of force. You will find more detailed information on these bearings in our **"Linear Motion Bearings"** brochure **TI-I-7001**.

The IBC product range includes **ATCoat thin dense chromium coated high precision rolling bearings and linear guidance systems** that are designed for special applications. The advantage of high precision rolling bearings and linear guidance systems that are coated with ATCoat derives from characteristics that increase their service life and from their very good resistance to wear and corrosion (**IBC Rolling Bearings With ATCoat Coating, ATC Thin Dense Chromium Technology**).

Our comprehensive product range enables us to develop specific and efficient bearing solutions for our customers, and in partnership with our customers.

Companies increasingly rely on global sourcing and the localisation of market-specific products for their business. That is why being able to **service a company's operations all over the world** is becoming increasingly important. IBC Wälzlager has production facilities and sales locations in Oberbiel (Germany), Asslar (Germany), Grenchen (Switzerland), Taichung (Taiwan), Aurangabad (India) as well as a sales base in Guangzhou (China). With our facilities, we are able to supply the European markets and have also gained access to the most important new markets of the future.

We will be glad to support you at an early stage of application engineering and will be happy to discuss any plans you may have.



Fig. 1.1: IBC LCX 35 series track roller linear guidance system with CS 35-21.2RS series carrier

2. Product Description and Applications

IBC Easy-Runners are high-class and precise linear ball bearings with a very compact design.

An inner profile rail is moved within an outer profile rail via cage-guided balls. The inner profile rail thus produces the stroke. During movement, the balls run on suitably formed ball raceways with zero clearance, just as they would in a rolling bearing, where they make rolling contact with 4 contact points in a precise linear movement. Since only a minimal amount of friction is produced due to the 4 contact points, this technique enables the bearings to achieve very small displacement forces and acceleration forces, while at the same time exhibiting a high degree of stiffness. The 4 contact points also ensure a noiseless run, even for great loads and high operating speeds. IBC linear ball bearings are compact in their design and therefore require little installation space.

The outer and inner profile rails are manufactured from high-quality quenched and tempered steel (58CrMoV4). Their ball raceways have been treated by an induction surface hardening process, which allows for **very high load ratings** and **extremely long life times**.

IBC Easy-Runners are therefore generally characterised by a high **power density** and, as a consequence, they are **very efficient**.

IBC Easy-Runners mainly consist of an outer profile rail, an inner profile rail (subsequently called "carriage slider"), and a linear ball cage that contains the balls running in it. The rolling elements permit an even and low-friction transmission of force that simultaneously achieves great stiffness. The linear guides

can be manufactured with or without clearance, or they can be preloaded. Limit stops are fitted to limit the preset strokes. We recommend installing external end stops.

The following list, taken from the broad range of possible applications, contains some typical areas of application:

- housings of machine tools and production plants
- transport engineering: door opening systems, battery boxes, etc.
- handling and automation systems
- logistics, shelf access equipment, etc.
- medical technology
- installed equipment in rescue, fire-fighting and municipal-utility vehicles
- aerospace
- printing machines

As the applications within these industries vary greatly, the requirements that the linear ball bearings need to meet are quite diverse too. Within the handling and automation industry and in transport engineering the focus is on speed, and therefore on high productivity accompanied by low energy consumption. Within the machine tool sector, the emphasis is on great stiffness and on smooth running characteristics. Choosing the right type will depend on factors such as load, speed, stroke, and acceleration, but also on factors such as temperature, lubrication, vibration, maintenance, and installation.

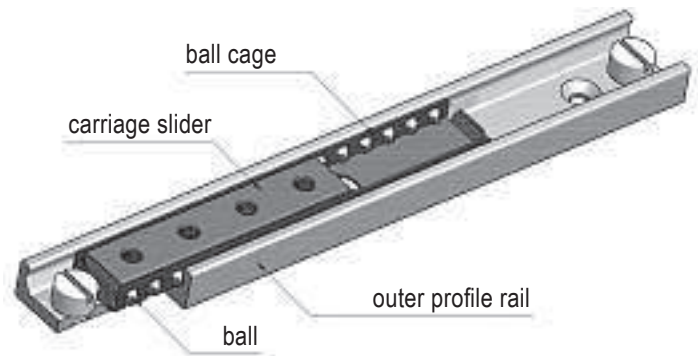


Fig. 2.1: IBC Easy-Runner LCE

3. Designs

IBC linear ball bearings are available with guide lengths between 130 mm and 1,970 mm that meet individual requirements. All variations described in the following are available in sizes **28H**, **35** and **43**.

The carriage slider is moved exclusively within the outer profile rail. This means that the carriage slider is always shorter than the outer profile rail and is not extendable. We supply variations that have at least 2 carriage sliders in a shared ball cage. Other variations have 2 carriage sliders in separate ball cages. These are used, for instance, for long parts that need to be guided, or for two-piece bus doors that open outward from the middle. Since so many variations of the types with more than one installed carriage slider exist, the standard range of these production series has not been included in this catalogue. Please contact our technical department for more information on this topic.



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Fig. 3.1: Typical structure of an IBC Easy-Runner



Fig. 3.2: IBC Easy-Runner LCE with 2 carriage sliders in separate ball cages



Fig. 3.3: IBC Easy-Runner LCE with 2 carriage sliders in a shared ball cage

4. Technical Properties

4.1 Materials

- Material of the outer and inner profile rails: high-quality 58CrMoV4 quenched and tempered steel (1.7792), unless otherwise specified
- Outer and inner profile ball-raceways: inductively surface hardened
- Balls: made of 100Cr6 bearing steel (1.3505); as an option: made of X45Cr13 corrosion resistant steel (1.3541); e.g. for applications within the food industry

4.2 Surface platings

- via electrogalvanisation;
- optional: electroless nickel plated; other platings available on request; suitable for use with foodstuffs if ATCoat coated, increases life time, good dry running properties

4.3 Lubrication

- for life lubrication with high-quality lubricant for linear guides; optional special lubrication, depending on the application; (see page 11 for lubrication time intervals)

4.4 Temperature ranges of application

- Standard: -30 °C to +140 °C
- If elastomers are used, e.g. for damped end stops, the permissible range of application is -30 °C to +100 °C; max. +125 °C possible for a short time
- Lower and higher temperature ranges are available on request.

4.5 Lengths

- Installation lengths: 130 mm to 1,970 mm; special lengths available on request
- Stroke lengths: 34 mm to over 1,474 mm; special strokes available on request

4.6 Travel speeds

- max. 0.8 m/s (depending on the application and the installation length)

Please note:

- For fast changes in direction and great acceleration forces, cage slip may occur in unfavourable conditions, especially in the case of long ball cages (see page 11).

4.7 Static load ratings

- C_{0rad} : from 1,000 to 67,200 N

4.8 Limit stops

- Each telescopic pullout has been designed to secure the ball cage via limit stops once the maximum stroke is reached.

Please note:

- It is advisable to install external end stops.

4.9 Fastener spacing

- The spacing of the holes for fastening is 80 mm as standard. We can provide other fastener spacings on request. The edge distance is 25 mm.

4.10 Friction coefficients

- The coefficient is smaller or equal 0.01 if the linear ball bearings are used properly and mounted on adjacent parts that are level and stiff.

5. Technical Dimensioning

5.1 Technical variables, definitions and units

- C = dynamic load rating [N]
- $C_{O_{ax}}$ = permissible static axial load rating [N]
- $C_{O_{rad}}$ = permissible static radial load rating [N]
- 1L = half the length of the carriage slider for the LCE type (see fig. 5.2 on page 9) [mm]
- l = eccentric lever (see fig. 5.2 on page 9) [mm]
- L_h = calculated life time [h]
- L_{km} = calculated life span [km]
- M_x = permissible moment of load in X-direction [Nm]
- M_{1x} = effective moment of load in X-direction [Nm]
- M_y = permissible moment of load in Y-direction [Nm]
- M_{2y} = effective moment of load in Y-direction [Nm]
- M_z = permissible moment of load in Z-direction [Nm]
- M_{3z} = effective moment of load in Z-direction [Nm]
- P = external load [N]
- ΣP = equivalent load [N]
- P_o = effective, static load [N]
- $P_{O_{ax}}$ = effective, static, axial load [N]
- $P_{O_{rad}}$ = effective, static, radial load [N]
- $P_{zul.}$ = permissible load [N]
- S = safety factor that allows for operating conditions
- S_L = safety factor that allows for operating conditions when calculating life time
- w = design-specific coefficient to be considered when calculating bending under load
- X = load rating coefficient for life time calculation
- z = reduction factor for eccentric loads

5.2 Guide to choosing the suitable linear ball bearing

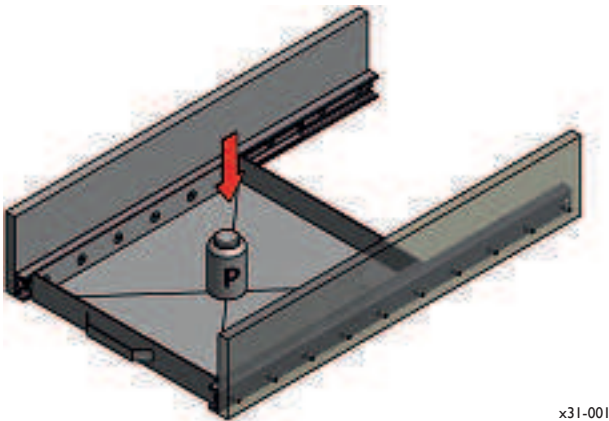
In order to choose a suitable linear ball bearing you will first need to determine the available installation space, the applicable load and the desired stroke.

Next, you will need to clarify issues regarding operating conditions and the required life time. With regard to operating conditions, you will need to take into account such influencing factors as operating temperature, levels of contamination, and exceptional impacts (e.g. vibrations). The individual calculation steps are explained on the following pages.

5.3 Static load

The static load values $C_{O_{rad}}$ and $C_{O_{ax}}$, which are contained in the product tables (in chapter 7), refer to the maximum load that is permitted to act on the middle of the carriage slider (see fig. 5.1). The load rating will remain unaltered for the path of the whole stroke, because the path is always located within the outer profile rail. Load values that exceed the maximum permissible load values specified in the product tables will affect the running characteristics and, as a consequence, the strength of a linear ball bearing. All values in the product tables apply to a single linear ball bearing, which means that the following applies to a paired arrangement:

$$P_{zul.} = 2 \cdot C_{O_{rad}} \quad [N] \quad [5.1]$$



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Fig. 5.1: Presumed point of load application for paired installation

Linear ball bearings are normally subject to external influences, which can be taken into account by factoring in a suitable safety factor. The specific factors are contained in table 5.1.

Influencing variable	Safety factor S
Good installation conditions; precise and stiff mounting; clean environment; fairly constant temperature ranges; No vibrations or shock impact loads; slow changes in direction	1-1.5
Normal installation conditions	1.6-2
Adverse installation conditions; mounting is not very stiff; vibrations and shock impacts; fast changes in direction; heavy contamination	2.1-3.5

Table 5.1: Safety factor S for ambient conditions

Based on the above, the ratio of the effective load P to the static load rating $C_{O_{rad}}$ or $C_{O_{ax}}$ should always amount to the following:

$$\frac{P_{O_{rad}}}{C_{O_{rad}}} \leq \frac{1}{S} \quad \frac{P_{O_{ax}}}{C_{O_{ax}}} \leq \frac{1}{S} \quad [5.2]$$

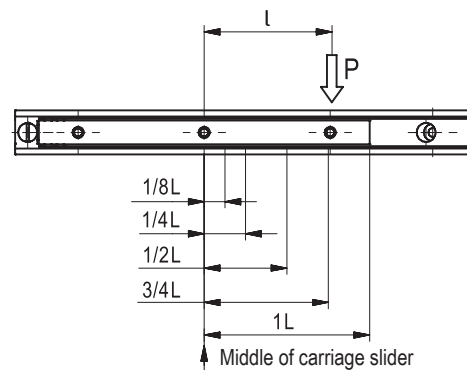
$$\frac{M_{1x}}{M_x} \leq \frac{1}{S} \quad \frac{M_{2y}}{M_y} \leq \frac{1}{S}$$

$$\frac{M_{3z}}{M_z} \leq \frac{1}{S}$$

If forces and moments of load impact from several directions, then the following applies:

$$\frac{P_{O_{rad}}}{C_{O_{rad}}} + \frac{P_{O_{ax}}}{C_{O_{ax}}} + \frac{M_{1x}}{M_x} + \frac{M_{2y}}{M_y} + \frac{M_{3z}}{M_z} \leq \frac{1}{S} \quad [5.3]$$

If eccentric loading of the carriage slider occurs (see fig. 5.2), the static load rating $C_{O_{rad}}$ must be reduced by a factor z, which is factored in on the basis of table 5.2 on page 10.



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Fig. 5.2: Eccentric radial loading

l	z
1/8 L	0.65
1/4 L	0.37
1/2 L	0.25
3/4 L	0.20
1 L	0.15

Table 5.2: Load rating reduction factor z, which depends on the eccentric lever l

The permissible load P_{zul} is reduced by means of the following:

$$P_{zul} = z \cdot C_{O_{rad}} \quad [N] \quad [5.4]$$

for a radial load

$$P_{zul} = z \cdot C_{O_{ax}} \quad [N]$$

for an axial load

When checking your life time calculation (calculated by means of formula 5.6) and the static load, determine the loads $P_{O_{rad}}$ and $P_{O_{ax}}$ as follows:

$$P_{O_{rad}} = \frac{P}{z} \quad [N] \quad [5.5]$$

for the radial impact of the external load P

$$P_{O_{ax}} = \frac{P}{z} \quad [N]$$

for the axial impact of the external load P

A combined load can be calculated by means of formula 5.7.

5.4 Life time calculation

The fact that the life time depends on the installation conditions and the ambient conditions is taken into account for calculations by factoring in a safety factor S_L (see table 5.3). The calculated life time spans the period from initial operation to the occurrence of the first signs of wear or fatigue.

$$L_{km} = 100 \cdot \left[\frac{(C_{O_{rad}})}{\Sigma P} \cdot \frac{1}{S_L} \right]^3 \quad [km] \quad [5.6]$$

Influencing variable	Safety factor S_L
Slow changes in direction, no shocks or vibrations, clean environment	1.3 – 1.8
Few vibrations, normal changes in direction, and normal ambient conditions	1.81 – 2.3
Frequent vibrations and shocks, contaminated environment, frequent and fast changes in direction	2.31 – 3.5

Table 5.3: Safety factor S_L for operating conditions

Method of calculation

Provided the effective static load P_O is equivalent to the maximum permissible value $C_{O_{rad}}$, and provided good operating conditions ($S_L = 1$) apply, then the calculated life time $L_{km} = 100$ km.

For several loads, the impacting overall load is calculated as the equivalent load ΣP by means of the following formula:

$$\Sigma P = P_{O_{rad}} + \left[\frac{P_{O_{ax}}}{C_{O_{ax}}} + \frac{M_{1x}}{M_x} + \frac{M_{2y}}{M_y} + \frac{M_{3z}}{M_z} \right] \cdot C_{O_{rad}} \quad [N] \quad [5.7]$$

5.5 Travel speed

Depending on ambient influences like temperature, contamination and possible vibrations, a travel speed of 0.8 m/s should not be exceeded.

6. Mounting Advice

Stiffness, a smooth run and durability are important characteristics of IBC linear ball bearings. The bearings are also compact in their design and easy to assemble.

The easy-to-assemble design of the bearings significantly reduces maintenance and shutdown times and therefore cuts costs.

■ Fitting position

It is advisable to mount linear ball bearings in a horizontal or near-horizontal fitting position.

For installations where bearings are mounted in a vertical position it cannot be completely ruled out that the ball cage will move downward if the stroke is not fully utilised. This is due to the specific guide design. Assuming the least favourable scenario, this movement of the cage will negatively impact operation conditions and/or life time. If you are operating such an installation, it is advisable to carry out a no-load stroke from time to time in order to shift the cage back into its correct position. From a technical point of view, we would advise you to install linear ball bearings whose balls are guided by a guideway if you are contemplating a vertical design. Please contact our technical department for more information on this issue.

■ End stops

We recommend you provide external end stops. The internally fitted stops have only been designed to limit the cage.

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■ Lubrication time intervals

During manufacture, IBC linear ball bearings are lubricated for life with high-grade special grease for linear guides.

Re-lubrication is advisable at certain intervals, depending on ambient conditions, operating temperatures, speeds, operating frequency, etc. Should you lack practical experience in this matter, we recommend you re-lubricate after 6 to 12 months of service life. It is advisable to clean all linear ball bearings before re-lubrication.

■ Fastening screws

As a standard solution, countersunk screws according to German standard DIN 7991 are used, appropriate to the relevant overall size. Always use screws of strength class 10.9.

Typical tightening torques are:

M5: 8.1 Nm | M6: 14.0 Nm | M8: 34.3 Nm

■ Utilisation of fastening holes

Some designs will not allow you to use all the fastening holes. This may be the case for variations with 2 or more carriage sliders, especially if the carriage sliders vary in length. Please contact our technical department if necessary.

■ Installation without clearance

The linear ball bearings are normally installed without clearance. However, we can supply variations with an increased preload or with clearance on request. Please contact our technical department for more information on this issue.

■ Cage slip

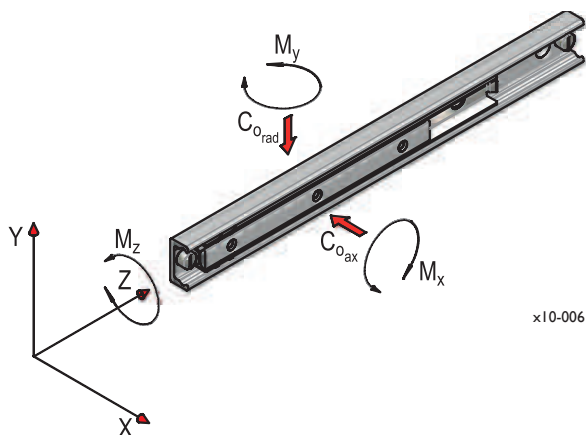
Under normal operating conditions, the cage moves in synchronisation with the carriage slider, but at half its speed; or, to put it another way, the ball cage follows the relevant stroke, albeit travelling half the distance. In unfavourable operating conditions, e.g. fast-changing acceleration or heavily fluctuating strokes, it is not always possible to avoid cage slip from occurring. In this case, you should schedule a no-load stroke, if possible, in order to re-position the cage. If strokes fluctuate, you should also ensure adequate dimensioning of the drive that is used. You can use a friction coefficient of 0.1 for the relevant calculations.

A note on using the product tables on the next pages:

- All load ratings specified apply to a single telescopic guide in continuous operation
- You can download all articles as 3D models from our website www.ibc-waelzlager.com

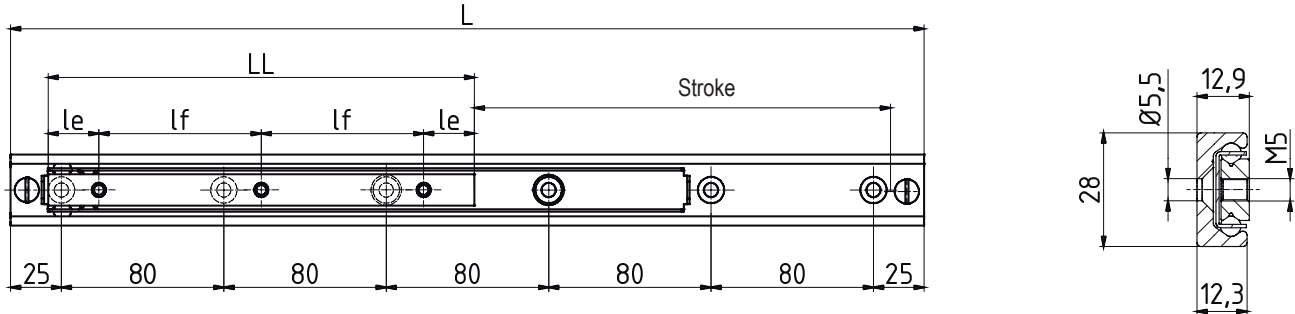
7. Product Overview

7.1 LCE 28H series



Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		C_{o_rad} N	C_{o_ax} N	M_x Nm	M_y Nm	M_z Nm
LCE 28H-0130-0060	34	130	2	60	10	20	3	0.23	3,584	2,509	37	25	18
LCE 28H-0210-0060	114	210	3					0.34					
LCE 28H-0290-0060	194	290	4					0.44					
LCE 28H-0370-0060	274	370	5					0.54					
LCE 28H-0450-0060	354	450	6					0.65					
LCE 28H-0210-0080	94	210	3	80			4	0.35	4,779	3,345	65	45	23
LCE 28H-0290-0080	174	290	4					0.42					
LCE 28H-0370-0080	254	370	5					0.56					
LCE 28H-0450-0080	334	450	6					0.67					
LCE 28H-0530-0080	414	530	7					0.78					
LCE 28H-0610-0080	494	610	8					0.89					
LCE 28H-0290-0130	124	290	4	130	25	80	2	0.50	7,766	5,436	166	117	38
LCE 28H-0370-0130	204	370	5					0.61					
LCE 28H-0450-0130	284	450	6					0.72					
LCE 28H-0530-0130	364	530	7					0.82					
LCE 28H-0610-0130	444	610	8					0.92					
LCE 28H-0690-0130	524	690	9					1.03					
LCE 28H-0770-0130	604	770	10					1.14					
LCE 28H-0850-0130	684	850	11					1.25					
LCE 28H-0930-0130	764	930	12					1.34					
LCE 28H-1010-0130	844	1010	13					1.45					
LCE 28H-0450-0210	204	450	6	210			3	0.79	12,545	8,782	430	300	62
LCE 28H-0530-0210	284	530	7					0.90					
LCE 28H-0610-0210	364	610	8					1.00					
LCE 28H-0690-0210	444	690	9					1.10					
LCE 28H-0770-0210	524	770	10					1.21					
LCE 28H-0850-0210	604	850	11					1.32					
LCE 28H-0930-0210	684	930	12					1.44					
LCE 28H-1010-0210	764	1,010	13					1.54					
LCE 28H-1170-0210	924	1,170	15					1.74					
LCE 28H-1330-0210	1,084	1,330	17					1.96					

Fasten the outer profile rail with M5 countersunk screws according to German standard DIN 7991.



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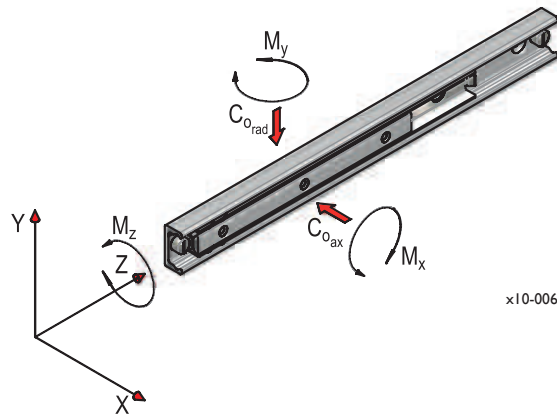
Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		$C_{O_{rad}}$ N	$C_{O_{ax}}$ N	M_x Nm	M_y Nm	M_z Nm
LCE 28H-0610-0290	284	610	8	290	25	80	4	1.07	17,225	11,910	815	570	83
LCE 28H-0690-0290	364	690	9					1.18					
LCE 28H-0770-0290	444	770	10					1.28					
LCE 28H-0850-0290	524	850	11					1.39					
LCE 28H-0930-0290	604	930	12					1.50					
LCE 28H-1010-0290	684	1,010	13					1.61					
LCE 28H-1170-0290	844	1,170	15					1.81					
LCE 28H-1330-0290	1,004	1,330	17					2.03					
LCE 28H-1490-0290	1,164	1,490	19					2.24					
LCE 28H-0770-0370	364	770	10	370			5	1.37	21,884	15,248	1,327	930	106
LCE 28H-0850-0370	444	850	11					1.46					
LCE 28H-0930-0370	524	930	12					1.57					
LCE 28H-1010-0370	604	1,010	13					1.68					
LCE 28H-1170-0370	764	1,170	15					1.88					
LCE 28H-1330-0370	924	1,330	17					2.10					
LCE 28H-1490-0370	1,084	1,490	19					2.32					
LCE 28H-0930-0450	444	930	12	450			6	1.68	26,683	18,462	1,960	1,374	130
LCE 28H-1010-0450	524	1,010	13					1.75					
LCE 28H-1170-0450	684	1,170	15					1.97					
LCE 28H-1330-0450	844	1,330	17					2.17					
LCE 28H-1490-0450	1,004	1,490	19					2.40					
LCE 28H-1650-0450	1,164	1,650	21					2.60					

Variations: – Two or more carriage sliders in a shared ball cage, see fig. 3.3 on page 6.
 – Two or more carriage sliders in separate ball cages, see fig. 3.2 on page 6.

Please contact our technical department for more information on special variations.

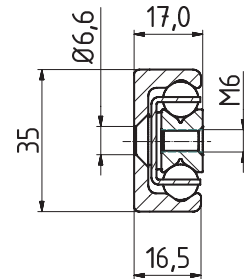
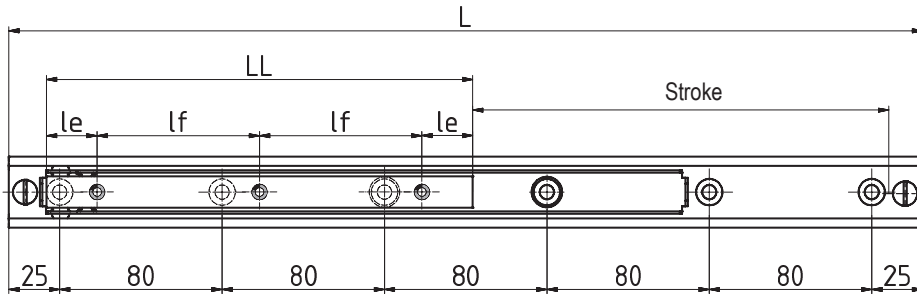


7.2 LCE 35 series



Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		C_{o_rad} N	C_{o_ax} N	M_x Nm	M_y Nm	M_z Nm
LCE 35-0290-0130	114	290	4	130	25	80	2	0.85	9,984	6,988	219	156	50
LCE 35-0370-0130	194	370	5					0.99					
LCE 35-0450-0130	274	450	6					1.14					
LCE 35-0530-0130	354	530	7					1.28					
LCE 35-0610-0130	434	610	8					1.42					
LCE 35-0690-0130	514	690	9					1.57					
LCE 35-0770-0130	594	770	10					1.71					
LCE 35-0850-0130	674	850	11					1.86					
LCE 35-0930-0130	754	930	12					2.00					
LCE 35-1010-0130	834	1,010	13					2.14					
LCE 35-0450-0210	194	450	6	210			3	1.34	16,128	11,290	560	397	87
LCE 35-0530-0210	274	530	7					1.48					
LCE 35-0610-0210	354	610	8					1.62					
LCE 35-0690-0210	434	690	9					1.77					
LCE 35-0770-0210	514	770	10					1.91					
LCE 35-0850-0210	594	850	11					2.06					
LCE 35-0930-0210	674	930	12					2.20					
LCE 35-1010-0210	754	1,010	13					2.34					
LCE 35-1170-0210	914	1,170	15					2.63					
LCE 35-1330-0210	1,074	1,330	17					2.92					
LCE 35-1490-0210	1,234	1,490	19					3.21					
LCE 35-0610-0290	274	610	8	290			4	1.82	22,272	15,590	1,086	745	109
LCE 35-0690-0290	354	690	9					1.97					
LCE 35-0770-0290	434	770	10					2.11					
LCE 35-0850-0290	514	850	11					2.26					
LCE 35-0930-0290	594	930	12					2.40					
LCE 35-1010-0290	674	1,010	13					2.54					
LCE 35-1170-0290	834	1,170	15					2.83					

Fasten the outer profile rail with M6 countersunk screws according to German standard DIN 7991.



d30-008

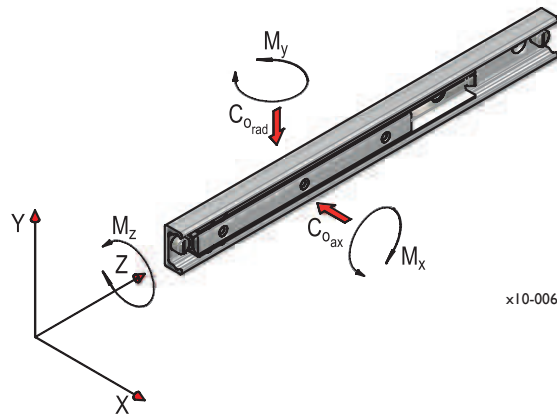
Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		C_{0rad} N	C_{0ax} N	M_x Nm	M_y Nm	M_z Nm
LCE 35-1330-0290	994	1,330	17	290	25	80	4	3.12	22,272	15,590	1,086	745	109
LCE 35-1490-0290	1,154	1,490	19					3.41					
LCE 35-1650-0290	1,314	1,650	21					3.70					
LCE 35-0770-0370	354	770	10	370			5	2.31	28,416	19,891	1,720	1,206	140
LCE 35-0850-0370	434	850	11					2.46					
LCE 35-0930-0370	514	930	12					2.60					
LCE 35-1010-0370	594	1,010	13					2.74					
LCE 35-1170-0370	754	1,170	15					3.03					
LCE 35-1330-0370	914	1,330	17					3.32					
LCE 35-1490-0370	1,074	1,490	19					3.61					
LCE 35-1650-0370	1,234	1,650	21					3.90					
LCE 35-0930-0450	434	930	12	450			6	2.80	34,560	24,192	2,541	1,783	169
LCE 35-1010-0450	514	1,010	13					2.94					
LCE 35-1170-0450	674	1,170	15					3.23					
LCE 35-1330-0450	834	1,330	17					3.52					
LCE 35-1490-0450	994	1,490	19					3.81					
LCE 35-1650-0450	1,154	1,650	21					4.10					
LCE 35-1810-0450	1,314	1,810	23					4.38					
LCE 35-1170-0530	594	1,170	15	530			7	3.43	40,704	28,493	3,521	2,469	198.5
LCE 35-1330-0530	754	1,330	17					3.72					
LCE 35-1490-0530	914	1,490	19					4.01					
LCE 35-1650-0530	1,074	1,650	21					4.30					
LCE 35-1810-0530	1,234	1,810	23					4.58					
LCE 35-1330-0610	674	1,330	17	610			8	3.92	46,848	32,794	4,663	3,268	229
LCE 35-1490-0610	834	1,490	19					4.21					
LCE 35-1650-0610	994	1,650	21					4.50					
LCE 35-1810-0610	1,154	1,810	23					4.78					

Variations: – Two or more carriage sliders in a shared ball cage, see fig. 3.3 on page 6.
 – Two or more carriage sliders in separate ball cages, see fig. 3.2 on page 6.

Please contact our technical department for more information on special variations.

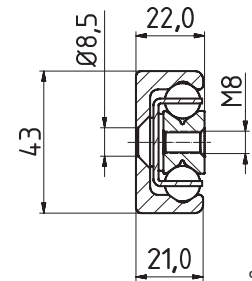
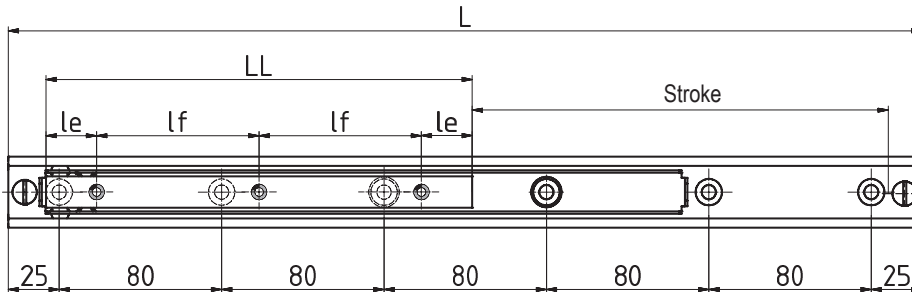


7.3 LCE 43 series



Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		$C_{o_{rad}}$ N	$C_{o_{ax}}$ N	M_x Nm	M_y Nm	M_z Nm
LCE 43-0290-0130	114	290	4	130	25	80	2	1.27	14,327	10,029	314	215	99.5
LCE 43-0370-0130	194	370	5					1.54					
LCE 43-0450-0130	274	450	6					1.79					
LCE 43-0530-0130	354	530	7					2.05					
LCE 43-0610-0130	434	610	8					2.10					
LCE 43-0690-0130	514	690	9					2.36					
LCE 43-0770-0130	594	770	10					2.83					
LCE 43-0850-0130	674	850	11					3.10					
LCE 43-0930-0130	754	930	12					3.35					
LCE 43-1010-0130	834	1,010	13					3.62					
LCE 43-0450-0210	194	450	6	210			3	2.00	23,144	16,201	790	552	157
LCE 43-0530-0210	274	530	7					2.26					
LCE 43-0610-0210	354	610	8					2.52					
LCE 43-0690-0210	434	690	9					2.77					
LCE 43-0770-0210	514	770	10					3.05					
LCE 43-0850-0210	594	850	11					3.30					
LCE 43-0930-0210	674	930	12					3.55					
LCE 43-1010-0210	754	1,010	13					3.82					
LCE 43-1170-0210	914	1,170	15					4.34					
LCE 43-1330-0210	1,074	1,330	17					4.86					
LCE 43-1490-0210	1,234	1,490	19					5.38					
LCE 43-1650-0210	1,394	1,650	21					5.90					
LCE 43-0610-0290	274	610	8	290			4	2.72	31,961	22,373	1,504	1,053	217
LCE 43-0690-0290	354	690	9					2.99					
LCE 43-0770-0290	434	770	10					3.24					
LCE 43-0850-0290	514	850	11					3.51					
LCE 43-0930-0290	594	930	12					3.77					
LCE 43-1010-0290	674	1,010	13					4.03					
LCE 43-1170-0290	834	1,170	15					4.55					
LCE 43-1330-0290	994	1,330	17					5.06					
LCE 43-1490-0290	1,154	1,490	19					5.58					
LCE 43-1650-0290	1,314	1,650	21					6.11					
LCE 43-1810-0290	1,474	1,810	23					6.64					

Fasten the outer profile rail with M8 countersunk screws according to German standard DIN 7991.



d10-005

Designation	Stroke mm	Rail guide		Carriage slider				Weight kg	Load ratings		Permissible moments of load		
		L mm	no. of holes	LL mm	le mm	lf mm	no. of holes		$C_{O_{rad}}$ N	$C_{O_{ax}}$ N	M_x Nm	M_y Nm	M_z Nm
LCE 43-0770-0370	354	770	10	370	25	80	5	3.46	40,778	28,544	2,448	1,712	275
LCE 43-0850-0370	434	850	11					3.71					
LCE 43-0930-0370	514	930	12					3.97					
LCE 43-1010-0370	594	1,010	13					4.24					
LCE 43-1170-0370	754	1,170	15					4.75					
LCE 43-1330-0370	914	1,330	17					5.27					
LCE 43-1490-0370	1,074	1,490	19					5.80					
LCE 43-1650-0370	1,234	1,650	21					6.31					
LCE 43-1810-0370	1,394	1,810	23					6.83					
LCE 43-0930-0450	434	930	12	450			6	4.18	49,395	34,216	3,614	2,531	334.5
LCE 43-1010-0450	514	1,010	13					4.44					
LCE 43-1170-0450	674	1,170	15					4.97					
LCE 43-1330-0450	834	1,330	17					5.47					
LCE 43-1490-0450	994	1,490	19					6.00					
LCE 43-1650-0450	1,154	1,650	21					6.52					
LCE 43-1810-0450	1,314	1,810	23					7.03					
LCE 43-1970-0450	1,474	1,970	25										
LCE 43-1170-0530	594	1,170	15	530			7	5.16	57,611	40,688	5,017	3,511	392
LCE 43-1330-0530	754	1,330	17					5.69					
LCE 43-1490-0530	914	1,490	19					6.20					
LCE 43-1650-0530	1,074	1,650	21					6.72					
LCE 43-1810-0530	1,234	1,810	23					7.25					
LCE 43-1970-0530	1,394	1,970	25										
LCE 43-1330-0610	674	1,330	17	610			8	5.88	66,319	46,160	6,644	4,650	452
LCE 43-1490-0610	834	1,490	19					6.41					
LCE 43-1650-0610	994	1,650	21					6.92					
LCE 43-1810-0610	1,154	1,810	23					7.45					
LCE 43-1970-0610	1,314	1,970											

Variations: – Two or more carriage sliders in a shared ball cage, see fig. 3.3 on page 6.
 – Two or more carriage sliders in separate ball cages, see fig. 3.2 on page 6.

Please contact our technical department for more information on special variations.



8. IBC Linear Guides with ATCoat Coating



Fig. 8.1: IBC Easy-Runner LCE with ATCoat coating

8. ATCoat coated linear motion bearings and telescopic guides

The material surface of machine parts is becoming more and more important to the overall performance of machines, power units and equipment. However, outside influences very often alter the surface quality of materials or corrode the surface material.

An ATCoat thin dense chromium coating protects the surface from outside environmental conditions and thereby increases the service life of linear guides and telescopic pullouts.

The advantages of this coating also include energy saving and an efficient use of material.

The ATCoat coating consists of 98% pure chrome. The chromium coating is extremely hard (between 75 and 78 HRC), free of cracks, firmly adhering, cone-shaped, precise, very thin, and highly pure (see fig. 8.2).

Because the process temperature during coating is below 80 °C there is no structural change to the basic material. The ATCoat coating is free of cracks and cone-shaped; this makes it much more resistant to corrosion than normal chromium coating.

Chrome also has very low wettability, a characteristic that enables it to repel aqueous media from its surface, enhancing resistance to corrosion even further.

The ideal coating thickness is between 2 µm to 4 µm thick, depending on the requirements of the components that are at risk of corrosion or abrasion. The holes of the profile rails are coated in a tapering manner in this case.

The ATCoat coating provides very good protection against corrosion and wear and results in good rolling capacity. You will find further information in our brochure **IBC Rolling Bearings With ATCoat Coating TI-I-5011**.

An ATCoat coating is very often applied to linear guides and telescopic pullouts in the food and chemical industries, where the typical industrial application exposes the machine parts concerned to corrosive or aggressive media, and where machine parts made of high-grade steel do not offer the required permissible load or permissible load rating.

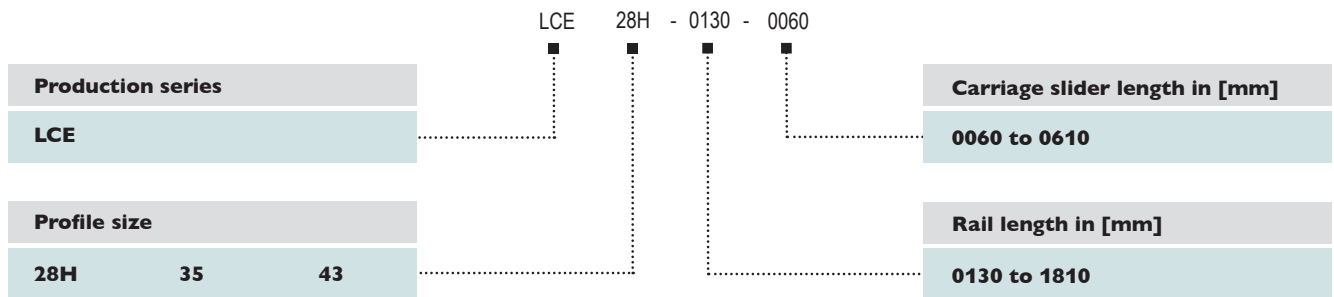
Because the ATCoat coating has received USDA approval and has been approved in accordance with EU Regulation No. 1935/2004, it may also be used in the food industry.



Fig. 8.2: Cross section of the ATCoat coating

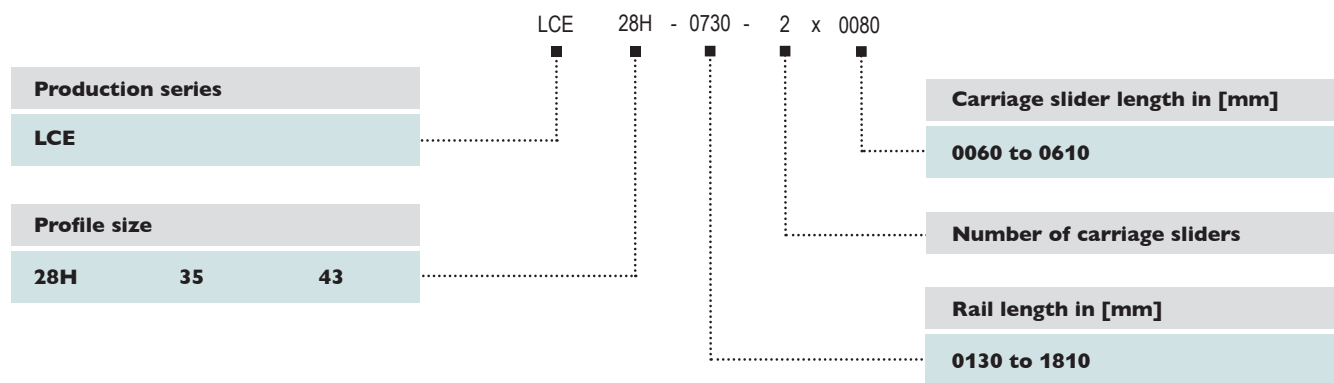
9. Designation System

LCE production series



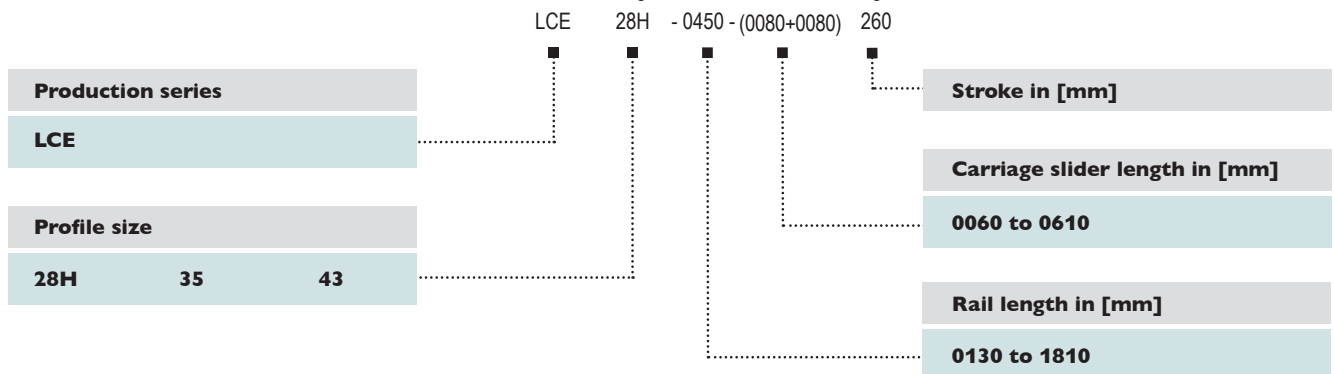
LCE production series

with two or more carriage sliders in separate ball cages



LCE production series

with two or more carriage sliders in a shared ball cage



IBC Easy-Runners with ATCoat coating are designated with an "AC" prefix, e.g. "AC-LCE ...".
 Electroless nickel plating has a "ChNi" suffix after the product key, e.g. LCAS 28H.E-0290.ChNi.



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