

ROLLON[®]
BY TIMKEN

X-Rail



Product explanation



> X-Rail roller sliders TEN-UEN-TEX/TES series



Fig. 1

X-Rail

Rails are made from sheet steel, shaped by high precision, ultra-smooth forming rollers. And then hardened using Rollon-NOX nitriding and black oxidising process to ensure an extended lifetime and excellent corrosion resistance. The slider bodies are cathodically blackened for maximum corrosion resistance. The rollers are made from core tempered and precision ground, bearing grade steel. The ball bearings are lubricated for life with wide temperature range bearing grease and protected by 2Z rated metal shields. Robust elastomer raceway wipers are fitted at both ends of the slider to protect the rollers and keep the raceways clean. The wipers incorporate oil-impregnated felt pads to keep the points of contact between raceway and roller properly lubricated, for the lifetime of the rail. Wipers are held in place by a simple clip and can be removed and replaced easily.

Maximum compactness

Compact section rails in a range of sizes, with protected internal rollers.

Black finish sliders

Elegant, top quality, black finish obtained by coating-free thermochemical treatment. Flame and abrasion resistant. Does not flake off.

Optimum lubrication

Extended, maintenance-free lifetime thanks to wipers with slow release felt lubricating pads that deposit a thin film of lubricant on the raceways.

Maximum strength

Fully nitrided hardened and black oxidised rails for excellent wear resistance and effective protection against corrosion.

Smooth sliding

Superbly smooth sliding, thanks to optimal preload adjustment of the eccentric rollers and good lubrication provided by the wipers with incorporated felt.

Self-aligning system

Can be used in conjunction with UEN U section rails to create a self-aligning two-slide motion system capable of compensating for installation alignment errors.

The most important characteristics:

- Silent and smooth movement
- Hardened for long lifetime with no wear
- Without maintenance
- Self-aligning
- Smooth black oxidation
- Strong wipers with incorporated preoiled felt
- High corrosion resistance
- Option for customized colour

> TEN-UEN-TEX/TES series

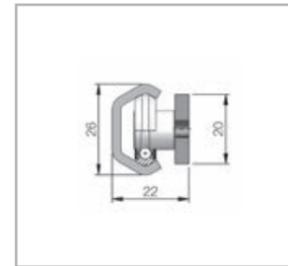


Fig. 2

TEN 26

Load capacity p. XR-7

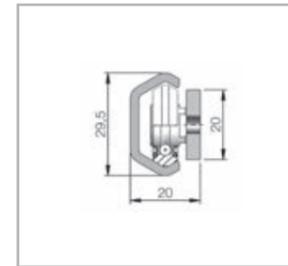


Fig. 3

TEN 30

Load capacity p. XR-7

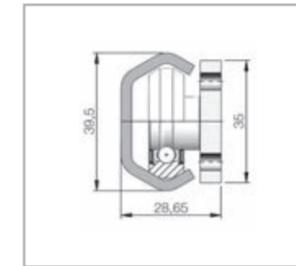


Fig. 4

TEN 40

Load capacity p. XR-7

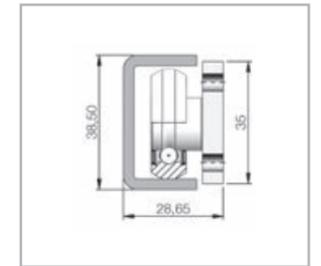


Fig. 5

UEN 40

Load capacity p. XR-7

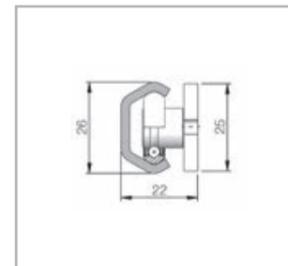


Fig. 6

TEX26-TES26

Load capacity p. XR-11

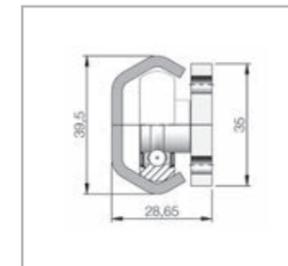


Fig. 7

TEX40-TES40

Load capacity p. XR-11

General characteristics



> “X-Rail” roller sliders construction design

Optional surface treatments where high corrosion resistance is required: **Rollon e-coating** technology, black epoxy resin electrodeposition (K version) with controlled thickness on the entire surface, except on the raceways, as masked before electrodepositioning. The raceways remain with standard oxidation treatment and protected with a thin layer of lubricant, released by the wipers.

- Corrosion resistance tested for 700 hours in salty fog
- Superb black glossy finish
- Excellent resistance in humid ambients
- Good resistance to oils and hydrocarbons

Optional customized rail coloring based on epoxy paint for application where special design look and high corrosion resistance are required. Standard in white and red color (versions CW and CR) with controlled thickness on the entire surface except on the raceways, which are masked previously to coloring. The raceways remain with standard oxidation treatment and protected with a thin layer of lubricant, released by the wipers.

- Unique esthetic coloring for design needs

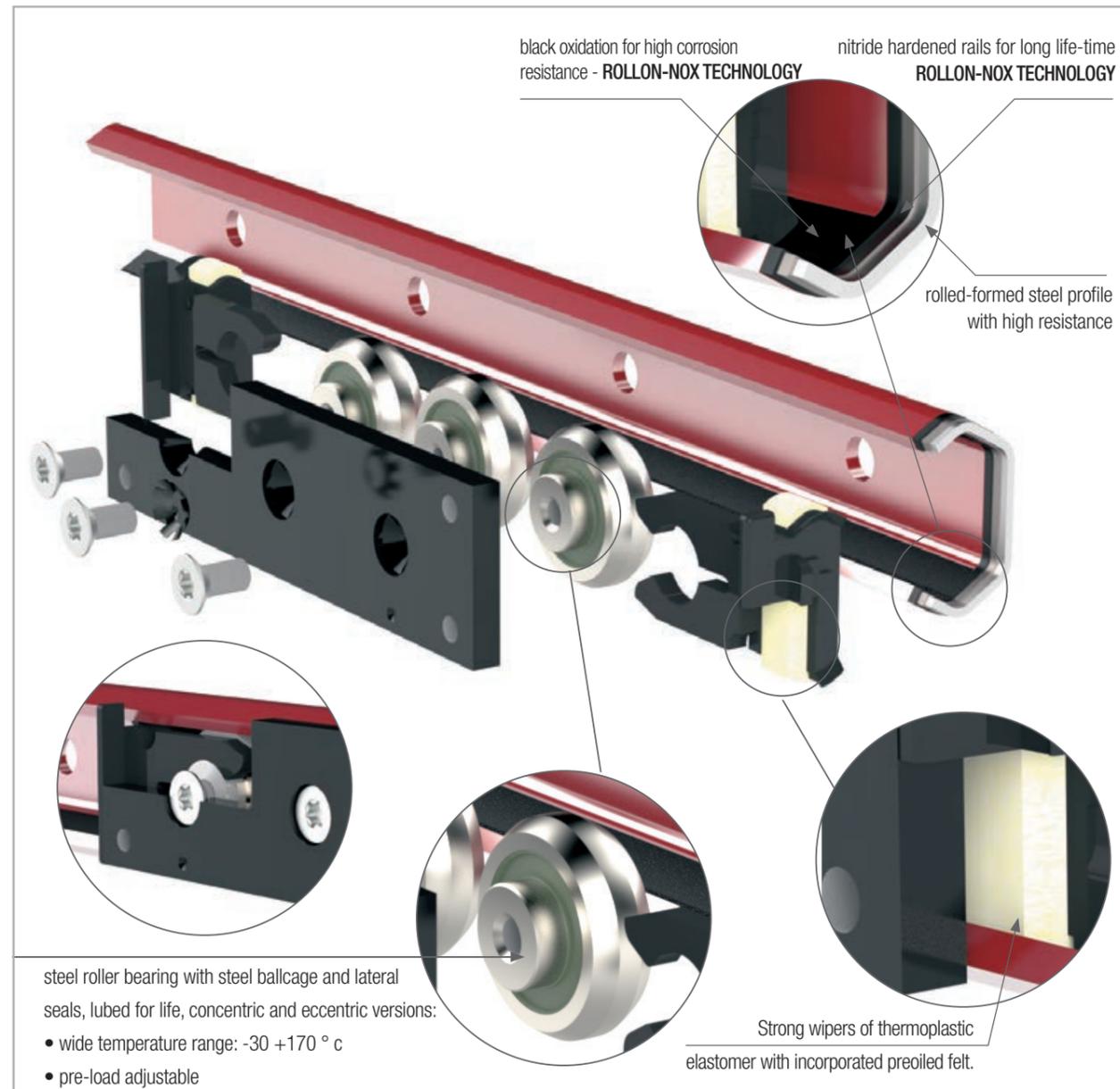


Fig. 8

> Roller positioning for sliders assembly

The sliders are available in 3 and 5 rollers configuration.

The 3 roller version has the two lateral rollers aligned and in contact with the same raceway. These two rollers are concentric and “fixed” - blocked with Loctite. The adjustable central roller is eccentric for preloading against the opposite raceway.

The 5 roller version has the two lateral and central roller aligned against the same raceway. These three rollers are “fixed”. The lateral are concentric rollers, while the central is an eccentric roller. The two adjustable rollers, next to the lateral roller, are eccentric and preloaded against the opposite raceway.

Maximum Load Capacity

The sliders' max. radial load capacities are given by the highest number of rollers aligned against the same raceway. As non symmetric roller positioning, the sliders must be positioned correctly during installation to obtain listed radial load capacities. Circular marks on the slider body, indicate the side with most rollers in contact with same raceway.

> Slider with 3 and 5 rollers

Slider with 3 rollers

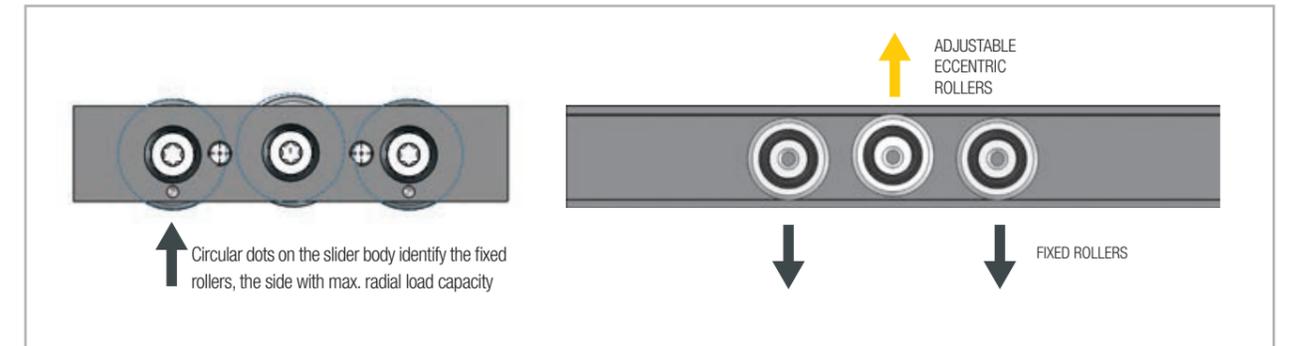


Fig. 9

Slider with 5 rollers

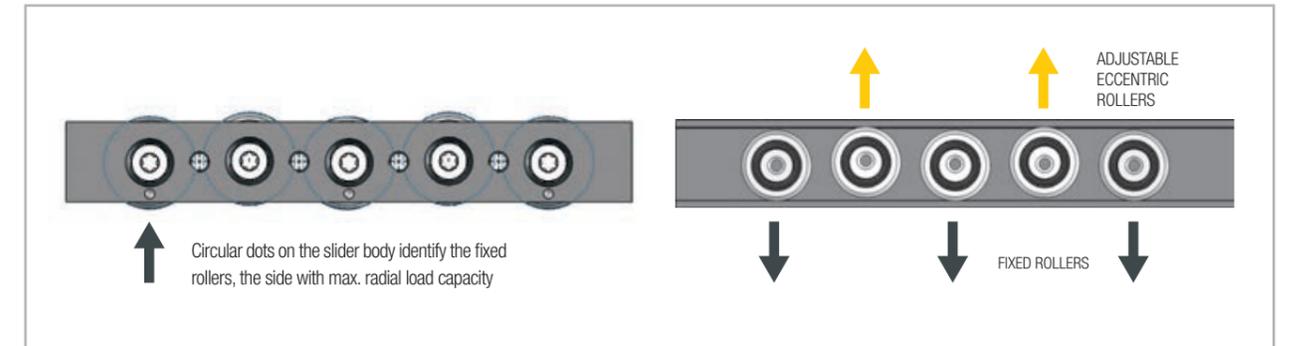


Fig. 10

Contact points of the rollers

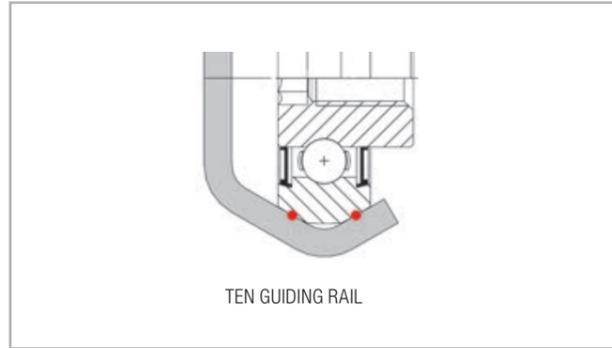


Fig. 11

The two inclined bearing slopes run on the two slopes of the V-shaped raceways of the TEN rail. These 2 points contact on each roller in upper or lower raceway, assure both radial and axial load capacity.

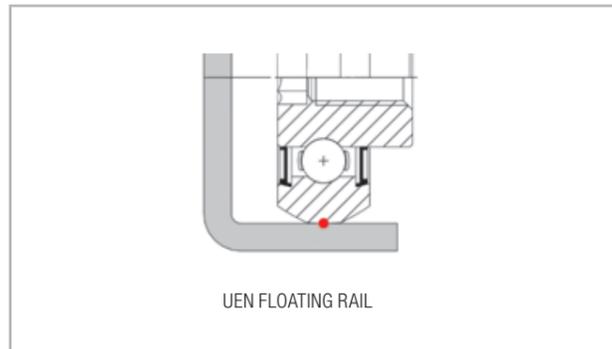


Fig. 12

The flat central surface of the roller runs on the flat raceway of the UEN rail. This one point contact of each roller in upper or lower raceway, provide only radial load capacity, but allows for axial floating capability.

Dimensions and load capacity



> Rails series TEN and UEN “nitride”

Design

TEN and UEN series rails are made from sheet steel and shaped by high precision, ultra-smooth forming rollers. They are then fully nitrided, black oxidised and impregnated with rust inhibitor for maximum corrosion resistance.

Rail mounting holes

Rail mounting holes have an 80 mm pitch. Either ISO 7380 button head Allen screws or Rollon flat head screws can be used.

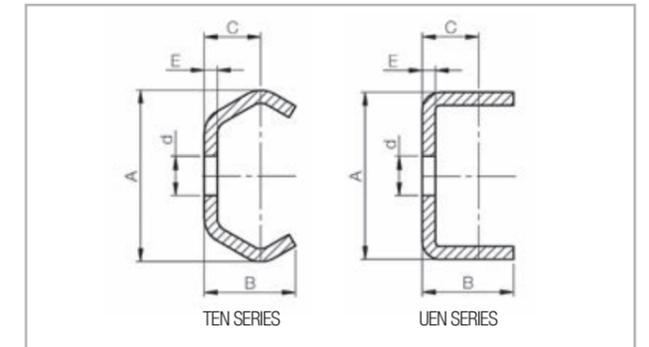


Fig. 13

Reference code	A (mm)	B (mm)	C (mm)	d (mm)	E (mm)	Screw type standard	WEIGHT (kg)
TEN 26	26	14	9,5	6,5	2,5	M5 (ISO 7380)	0,80
TEN 30	29,5	15	10	6,5	2,5	M5 (ISO 7380)	0,95
TEN 40	39,5	21	13	9	3	M8 (ISO 7380)	1,55
UEN 40	38,5	21	13	9	3	M8 (ISO 7380)	1,70

Tab. 1

Fixing screw dimensions

Reference code	KIT CODE (100 pz)	Screw type	M	V	G	S	Ch	Tightening torque
TEN 26	KIT-40.VB-E.0510.ZB	M5x10 ISO 7380	M5	10	9,5	2,7	3	9 Nm
TEN 30	KIT-40.VC-SP01.0510.ZB	M8x10 ISO 7380	M5	10	10	2	T25	9 Nm
TEN 40	KIT-40.VB-E.0810.ZB	M8x10 (ISO 7380)	M8	10	14	4,3	5	20 Nm
UEN 40	KIT-40.VC-SP01.0812.ZB	M8x12 (TORX)	M8	12	16	3	T40	20 Nm
	KIT-40.VC-SP01.0816.ZB	M8x16 (TORX)	M8	16	16	3	T40	20 Nm

The screws are not supplied with rails, can be bought separately.

Tab. 2

Standard iso 7380 screws

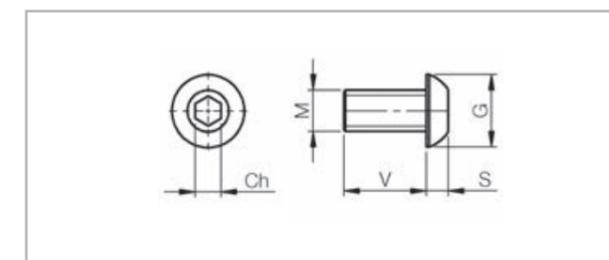


Fig. 14

Special ROLLON 40.vc-sp01 screws

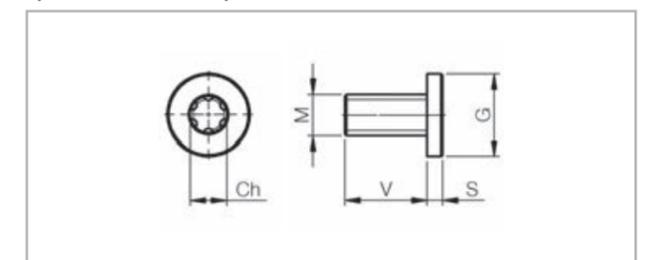


Fig. 15

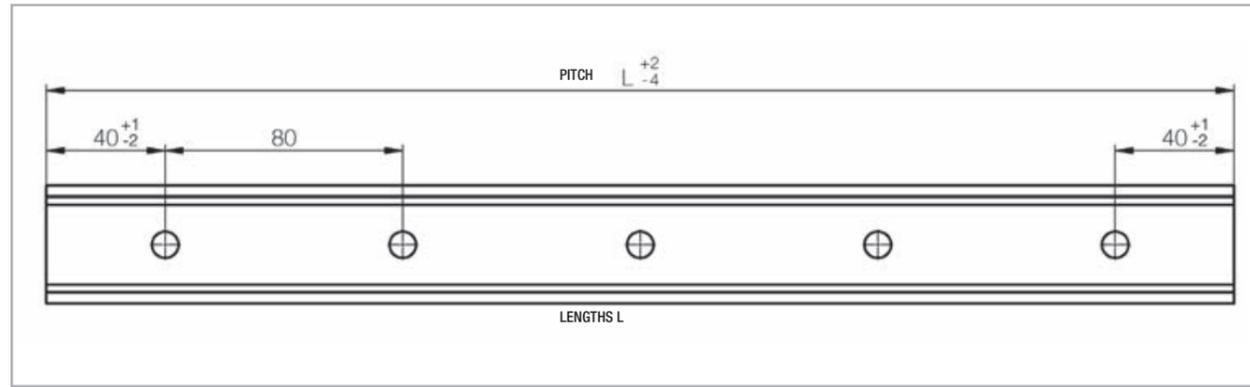


Fig. 16

> Rail size

Dimensions from 160 mm to 2000 mm

Rail codes	Length L (mm)																								
	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	
TEN 26
TEN 30
TEN 40
UEN 40

• Available in stock

Tab. 3

Dimensions from 2080 mm to 4000 mm

Rail codes	Length L (mm)																									
	2080	2160	2240	2320	2400	2480	2560	2640	2720	2800	2880	2960	3040	3120	3200	3280	3360	3440	3520	3600	3680	3760	3840	3920	4000	
TEN 26
TEN 30
TEN 40
UEN 40

• Available in stock

Tab. 4

Order codes	Version	Characteristics
TEN40-1040	BASIC	Rolled steel rail with "ROLLON-NOX" nitride hardening, black oxidation, cut to size after treatment. The cut ends are protected with black spray paint.
TEN40-1040-K	K	As base version, but with additional treatment "ROLLON e-coating" black electro painting on the entire surface, except on the inner raceway area, providing a high corrosion resistance, up to 700 hours in salty fog. The raceways are still protected by the standard oxidation and raceway lubrication.
TEN40-1040-CW	CW o CR	As base version, but with additional coloring "ROLLON p-color". CW is white-color version and CR is red-color version, - on the entire surface, except on the inner raceway area, providing a high corrosion resistance, up to 700 hours in salty fog. The raceways are still protected by the standard oxidation and raceway lubrication.

Tab. 5

> CEN26 - CEN30 Sliders

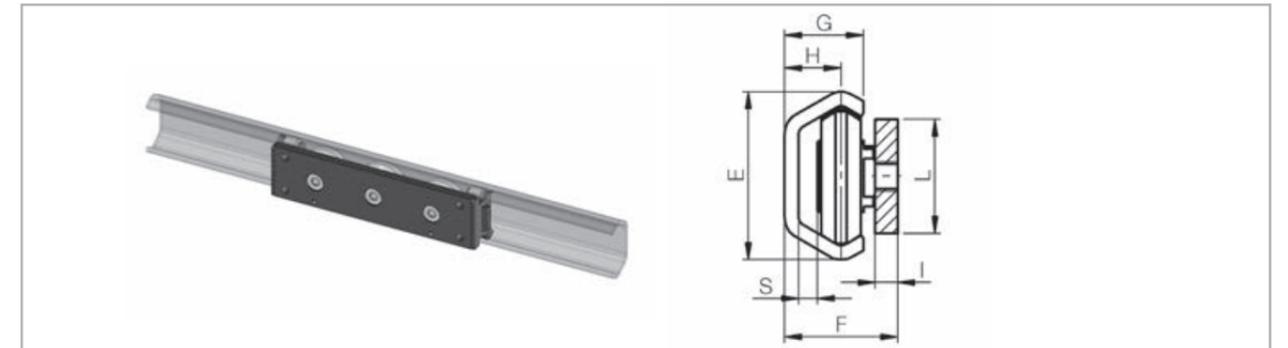
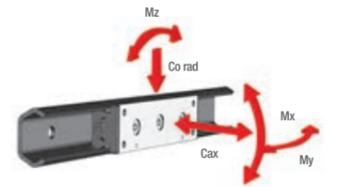


Fig. 17

The CEN26 - CEN30 sliders have slim steel body with black glossy cathaphoresis painting for high corrosion resistance. Available in 3 and 5 rollers, with and without wipers.



SLIDERS without wipers

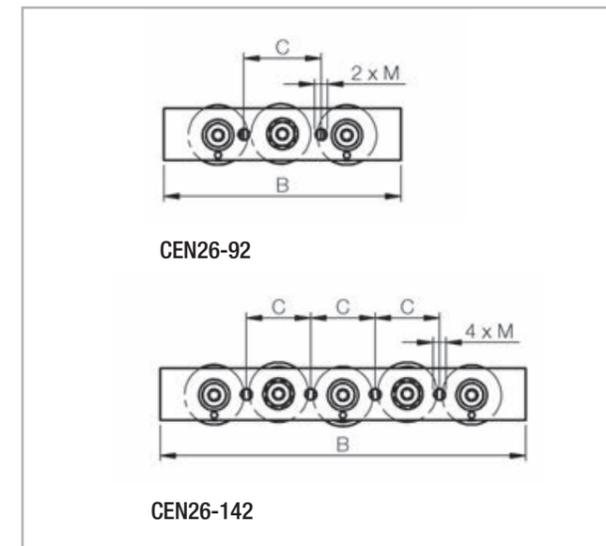


Fig. 18

SLIDERS with wipers

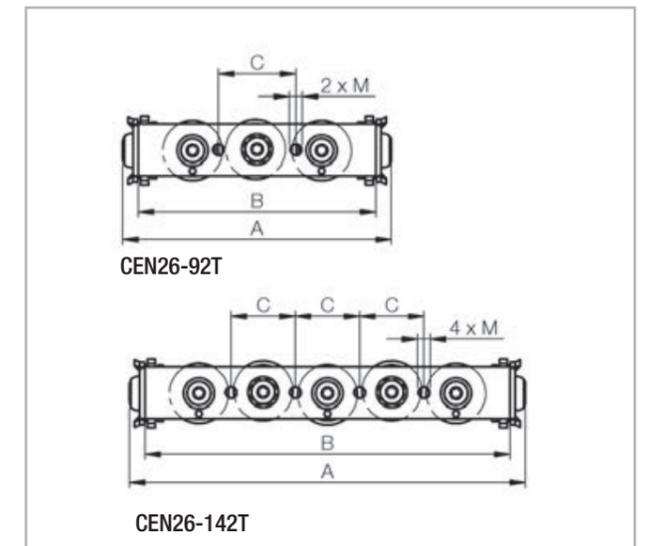


Fig. 19

Code	E (mm)	F (mm)	G (mm)	H (mm)	S (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	Weight (g)	Dynamic coefficient C (N)	Load capacity				
														Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
CEN26-92									-	92	30	100	1280	1120	380	3	9	16
CEN26-92T	26	22	14	9,5	3,7	4	20	M5	104		110							
CEN26-142									-	142	25	140	1730	1520	540	5	15	45
CEN26-142T									154		150							
CEN30-92									-	92	30	120	1360	1200	420	4	10	17
CEN30-92T	29,5	19,9	15	10	3,3	4	20	M5	104		130							
CEN30-142									-	142	25	160	1830	1620	580	6	17	50
CEN30-142T									154		170							

Tab. 6

> CEN40 Sliders

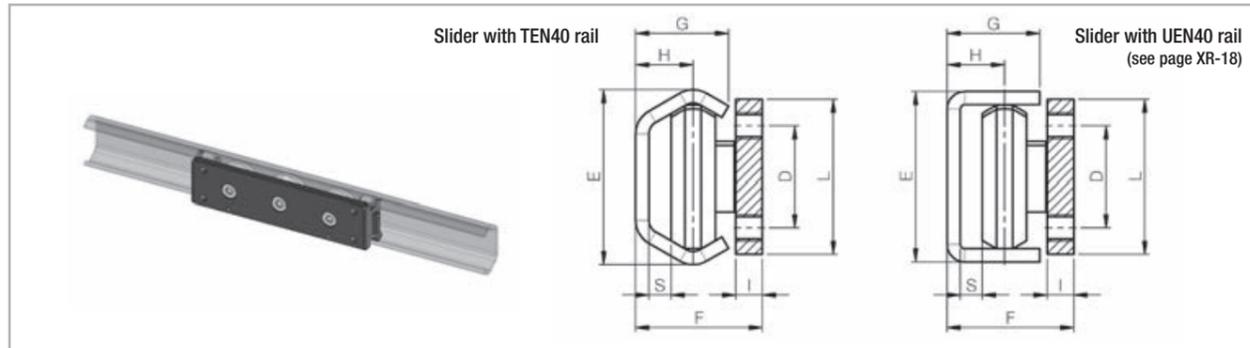
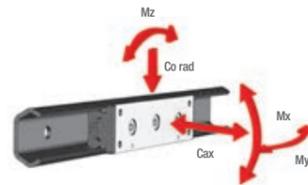


Fig. 20

The CEN40 slider has slim steel body with black glossy cataphoresis painting for high corrosion resistance. Available in 3 and 5 roller version, with and without wipers.



SLIDERS without wipers

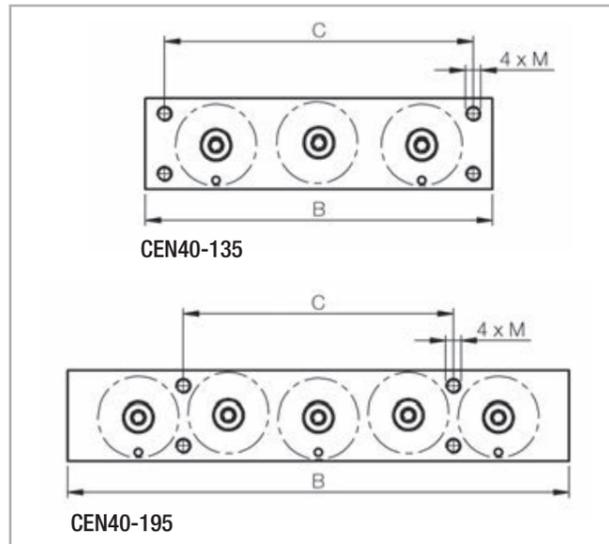


Fig. 21

SLIDERS with wipers

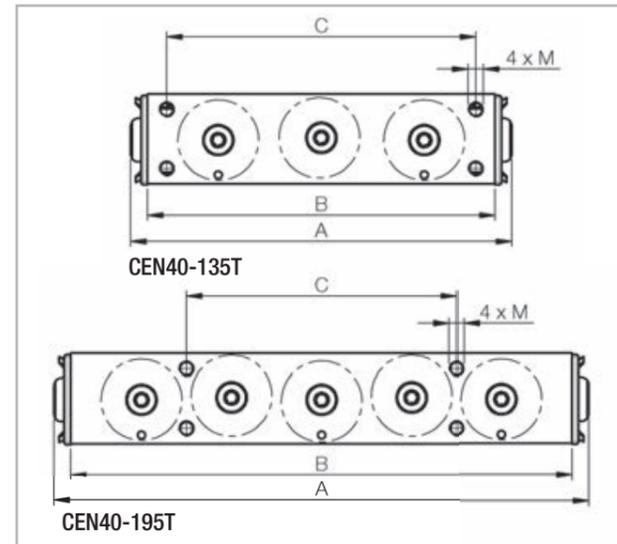


Fig. 22

Code	Type	E (mm)	F (mm)	G (mm)	H (mm)	S (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Dynamic coefficient C (N)	Load capacity				
																Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
CEN40-135	TEN40	39.5	28.65	21	13	5	6	35	M6	-	135	120	23	430	2720	2400	820	10	25	50
CEN40-135T										148	450									
CEN40-195										-	600									
CEN40-195T										208	620									
CEN40-135	UEN40	38.5	28.65	21	13	5	6	35	M6	-	135	120	23	430	1850	1850	0	0	0	34
CEN40-135T										148	450									
CEN40-195										-	600									
CEN40-195T										208	620									

Tab. 7

> TEX inox rails

TEX rails

The TEX rails, with their CEX sliders and rollers, are made entirely of stainless steel. They offer a simple and practical solution for all applications where high corrosion resistance is required, in particular for food industry, chemical, pharmaceutical and medical industries.

For applications in severe marine environments is proposed the version with all parts electro polished (X-version) for extra high corrosion resistances. The product is easily washable for applications subject to frequent cleaning, does not release particles in the environment and is particularly indicated for cleanroom applications. Available in two sizes: 26 and 40 mm.

Fixing holes

Rails have fixing pitch 80mm for standard INOX Button-head screws ISO 7380.

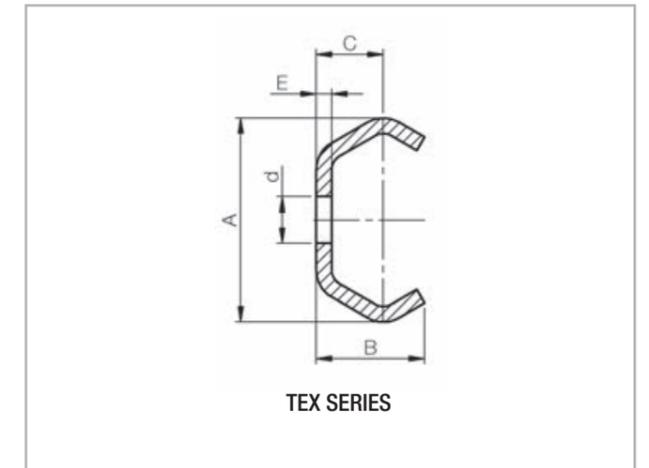


Fig. 23

Reference code	A (mm)	B (mm)	C (mm)	d (mm)	E (mm)	Screw type standard	WEIGHT (kg)
TEX 26	26	14	9,5	6,5	2,5	M5 (ISO 7380)	0,80
TEX 40	39,5	21	13	9	3	M8 (ISO 7380)	1,55

Tab. 8

Fixing screw dimensions

Reference code	KIT CODE (100 pz)	Screw type	M	V	G	S	Ch	Tightening torque
TEX 26	KIT-40.VB-E.0510.ZB	M5X10 (ISO 7380)	M5	10	9,5	2,7	3	
TEX 40	KIT-40.VB-E.0810.ZB	M8X10 (ISO 7380)	M8	10	14	4,3	5	

The screws are not supplied with rails, can be bought separately.

Tab. 9

Inox screws standard iso 7380

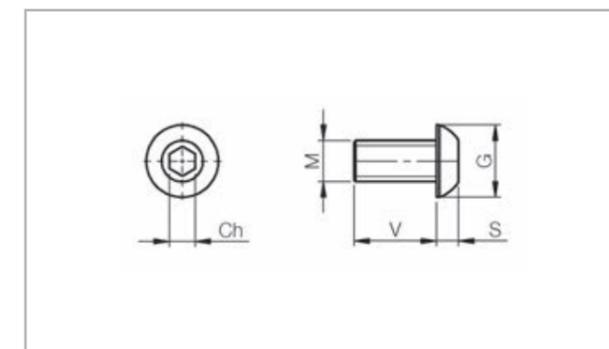


Fig. 24

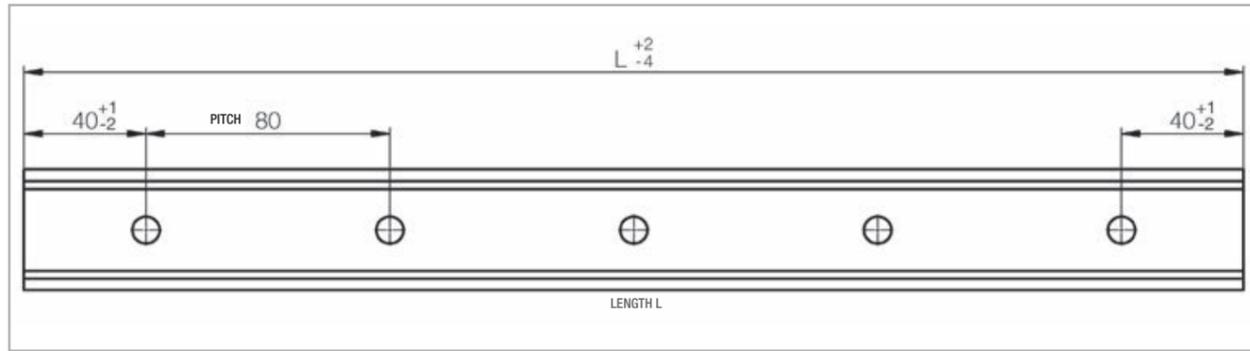


Fig. 25

> Rail size

Dimensions from 160 mm to 2000 mm

Rail codes	Length L (mm)																								
	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	
TEX 26	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
TEX 40																									

• Available in stock

Tab. 10

Dimensions from 2080 mm to 4000 mm

Rail codes	Length L (mm)																									
	2080	2160	2240	2320	2400	2480	2560	2640	2720	2800	2880	2960	3040	3120	3200	3280	3360	3440	3520	3600	3680	3760	3840	3920	4000	
TEX 26	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
TEX 40																										

• Available in stock

Tab. 11

Order codes	Version	Characteristics
TEX40-1040	BASIC	Profiled rail, INOX AISI 304
TEX40-1040-X	X	As base rail but with electro polished after cutting to size. Tested to 1000 hours in salty fog.

Tab. 12

> CEX sliders

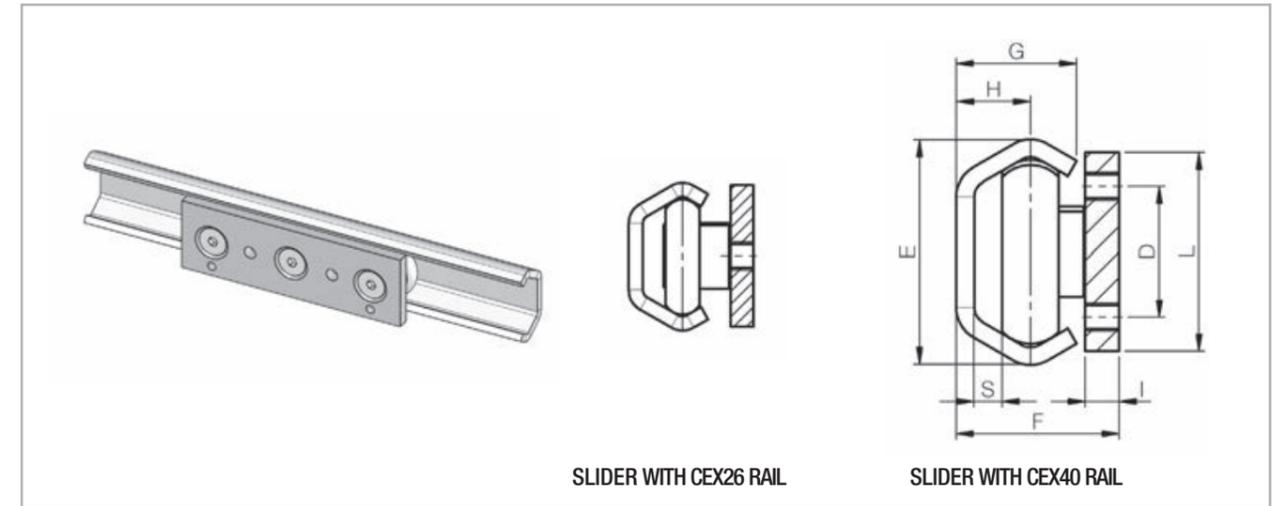
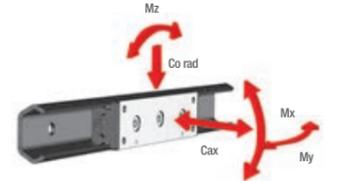


Fig. 26

The sliders are composed of a stainless steel AISI 304 body and 3 stainless steel AISI 440 rollers without wipers. The version with wipers is available only for the size 40.



SLIDERS without wipers

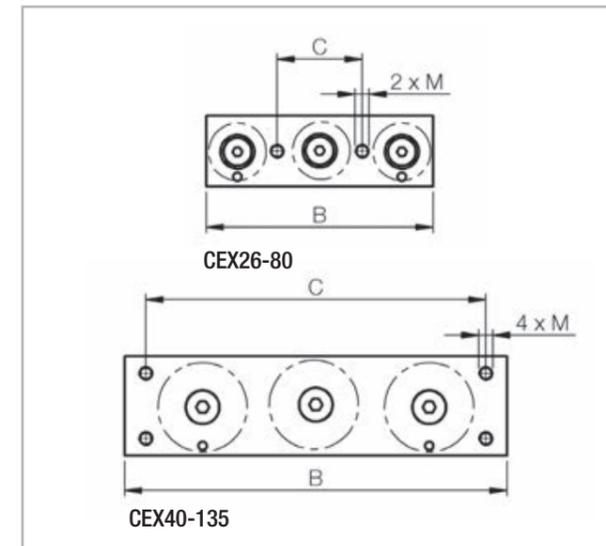


Fig. 27

SLIDERS with wipers

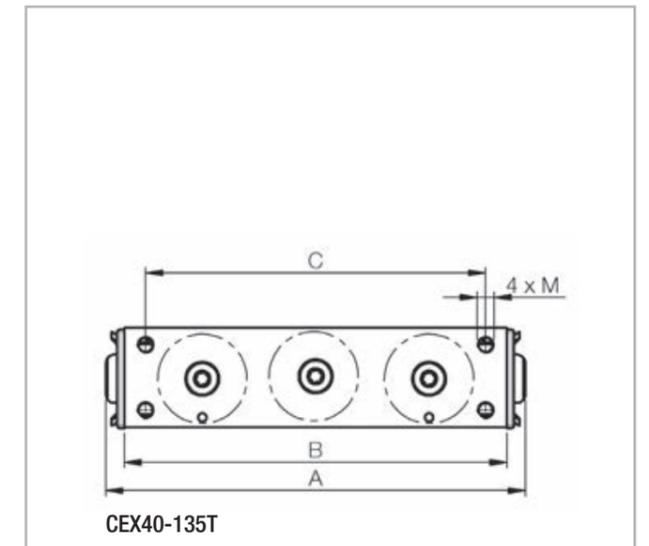


Fig. 28

Code	E (mm)	F (mm)	G (mm)	H (mm)	S (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Load capacity				
														Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
CEX26-80	26	22	14	9,5	3,7	4	20	M5	-	80	30	-	95	800	400	3	9	12
CEX40-135	39,5	28,65	21	13	5	6	35	M6	148	135	120	23	430	1600	800	9	23	32
CEX40-135T														1600	800	9	23	32

All sliders are also available in a fully electro-polished version. For the order code add suffix-X (eg CEX40-135-X)

Tab. 13

> TES rails

TES rails

The TES rails with its CES sliders are made of zinc plated steel, while the rollers are hardened bearing steel. They offer a simple and economical solution for a wide range applications, where high frequency is not required.

The compact overall dimensions, the internal protected raceways, the ease of assembly and the good ratio of load capacity /size make this product a winning choice compared to other self-built or available solutions on the market. The rails are available in two dimensions : 26 and 40 mm.

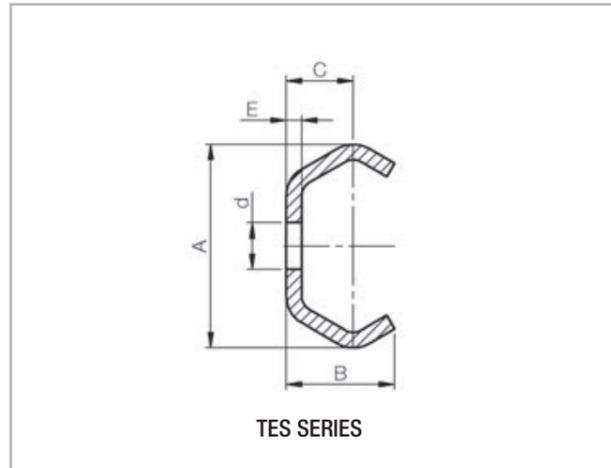


Fig. 29

Reference code	A (mm)	B (mm)	C (mm)	d (mm)	E (mm)	Screw type standard	WEIGHT (kg)
TES 26	26	14	9,5	6,5	2,5	M5 (ISO 7380)	0,80
TES 40	39,5	21	13	9	3	M8 (ISO 7380)	1,55

Tab. 14

Fixing screw dimensions

Reference code	KIT CODE (100 pz)	Screw type	M	V	G	S	Ch	Tightening torque
TES 26	KIT-40.VB-E.0510.ZB	M5X10 (ISO 7380)	M5	10	9,5	2,7	3	9 Nm
	KIT-40.VC-SP01.0510.ZB	M5X10 (TORX)	M5	10	10	2	T25	10Nm
TES 40	KIT-40.VB-E.0810.ZB	M8X10 (ISO 7380)	M8	10	14	4.3	5	20Nm
	KIT-40.VC-SP01.0816.ZB	M8X16 (TORX)	M8	16	16	3	T40	20Nm
	KIT-40.VC-SP01.0812.ZB	M8X12 (TORX)	M8	12	16	3	T40	20Nm

Screws are not supplied whit the rails

Tab. 15

Screws standard iso 7380

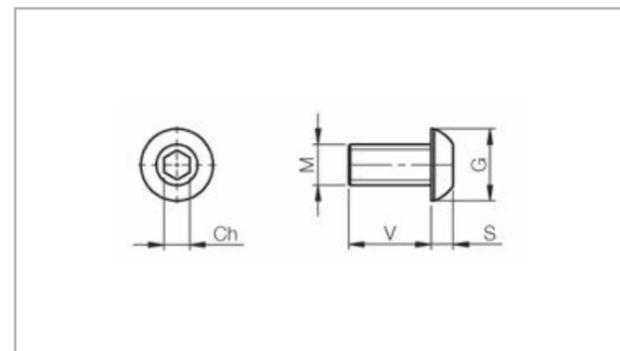


Fig. 30

Screws special ROLLON 40.vc-sp01.

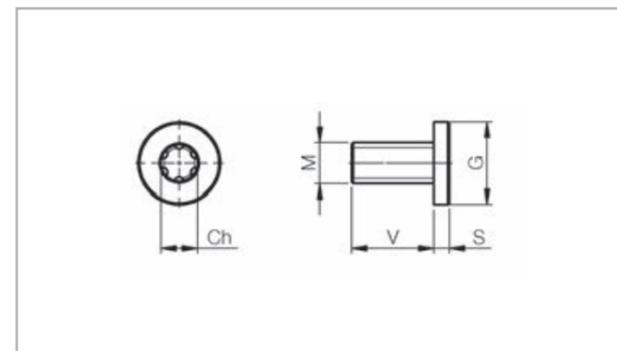


Fig. 31

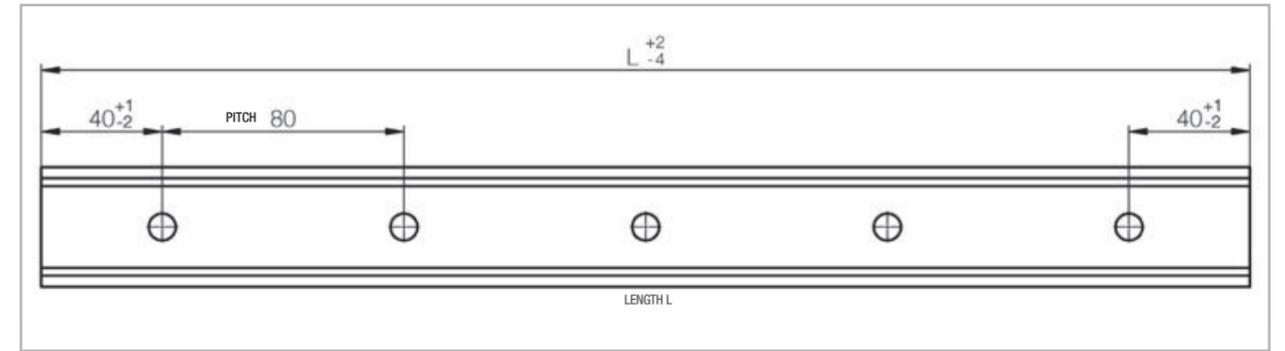


Fig. 32

> Rail size

Dimensions from 160 mm to 2000 mm

Rail codes	Length L (mm)																								
	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	
TES 26	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
TES 40			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

• Available in stock

Tab. 16

Dimensions from 2080 mm to 4000 mm

Rail codes	Length L (mm)																								
	2080	2160	2240	2320	2400	2480	2560	2640	2720	2800	2880	2960	3040	3120	3200	3280	3360	3440	3520	3600	3680	3760	3840	3920	4000
TES 26	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
TES 40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

• Available in stock

Tab. 17

Order codes	Version	Characteristics
TES40-1040	BASIC	Rolled formed steel, zinc plated, with the rails ends with protective zinc-spray after cutting to size.

Tab. 18

> CES sliders

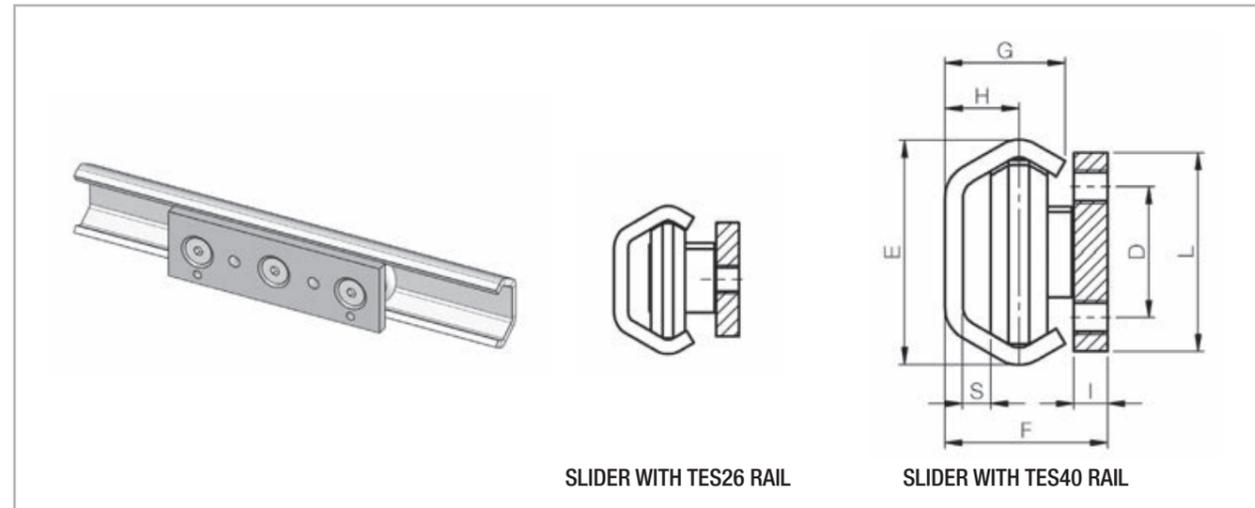
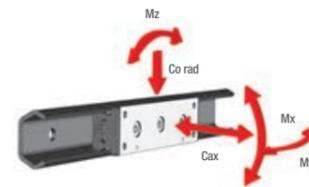


Fig. 33

The sliders CES26 for the rail TES26 feature a zinc plated steel body with two fixing holes. With the rails TES40 can be used the sliders CEN40-135 indicated on page XR-10 that have a body with black color surface treatment.



SLIDERS without wipers

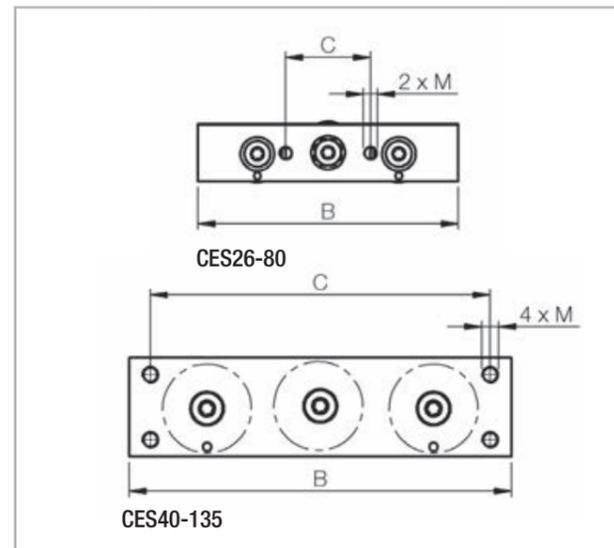


Fig. 34

SLIDERS with wipers

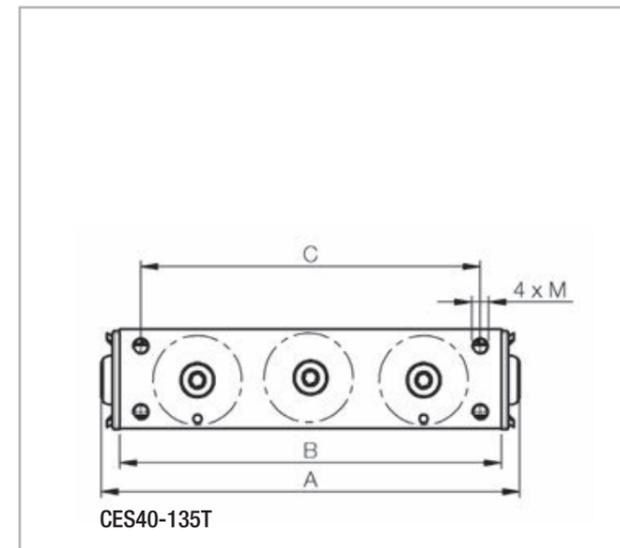


Fig. 35

Code	E (mm)	F (mm)	G (mm)	H (mm)	S (mm)	I (mm)	L (mm)	M (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Weight (g)	Load capacity				
														Co rad (N)	Co ax (N)	Mx (Nm)	My (Nm)	Mz (Nm)
CES26-80	26	22	14	9,5	3,7	4	20	M5	-	80	30	-	95	800	400	3	9	12
CES40-135	39.5	28.65	21	13	5	6	35	M6	148	135	120	23	430	1600	800	9	23	32
CES40-135T													450	1600	800	9	23	32

Tab. 19

> TEN40+UEN40 self-aligning system

In two-slide linear motion systems, one TEN40 rail can be combined with one UEN40 rail, with CEN40 sliders in both rails. This combination creates a self-aligning system capable of tolerating alignment errors of up to 3.4 mm.

The slider in the TEN40 guiding rail is rigidly connected, via the mobile element, to the sliders in the UEN40 floating rail on the other side. The TEN40 guiding rail ensures play-free linear motion. The slider in the UEN40 floating rail is therefore also play-free but able to move axially across the flat raceways. This system avoids overload on the sliders as the result of rail alignment error.

The limit of axial movement of CEN40 sliders towards the inside of UEN40 rails is determined by the size of the heads of the rail fixing screws (see figures below). In particular, ROLLON's special flat head DIN 7991 screws permit approximately 1 mm of extra axial movement compared to standard ISO 7380 screws.

The limit of axial movement towards the outside of the UEN40 rail is determined by the point of departure of the roller from the raceway. The limit specified in the catalogue guarantees sufficient contact between rollers and raceway to support rated load.

Sliders in UEN40 rails offer less load capacity than the same sliders in TEN40 rails.

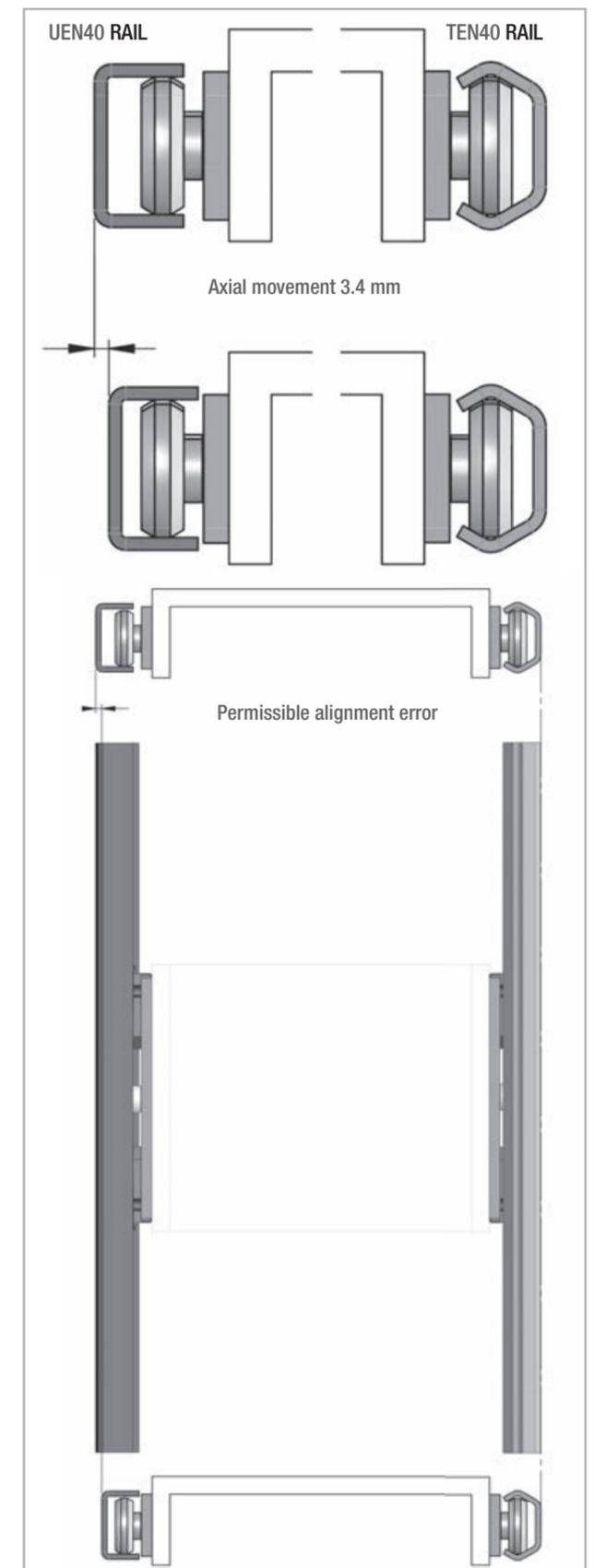
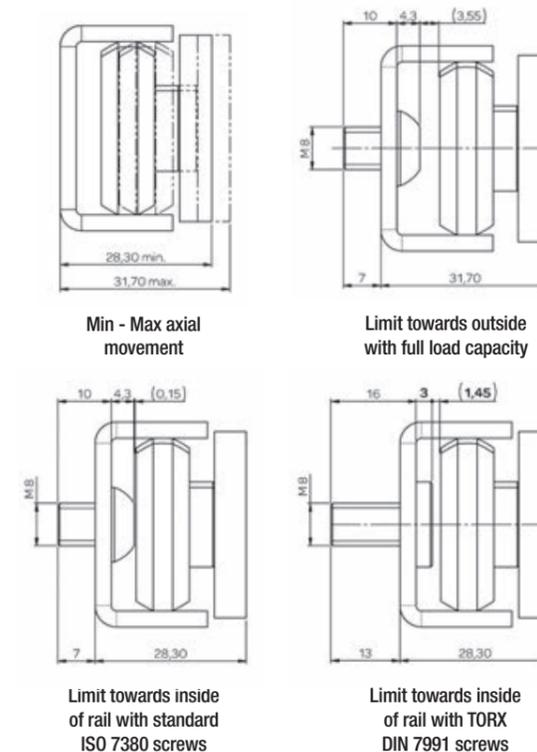


Fig. 36 XR-17

> Rollers for TEN and UEN series rails

As an alternative to our standard 3 and 5-roller sliders, rollers for TEN and UEN rails can also be mounted on custom sliders or directly on the mobile element. In such cases, the number, arrangement and types of roller need to be chosen to match the requirements of the application.

All rollers are made from core tempered and precision ground bearing grade carbon steel. Rollers are of the single row ball bearing type, with the balls held in place by a metal cage. Precision ground surfaces ensure a smooth, silent rolling action. Rollers are also fitted with 2Z rated metal shields to protect the ball bearings raceway and ensure good resistance to high temperatures. The ball bearing is lubricated for life with a wide

temperature ranging lithium soap grease. The mounting axle is made in one piece with the inner bearing, for maximum strength. Rollers come in two types: eccentric and concentric.

PEN and PCN series rollers for size 26 and 40 rails have a hexagonal recess for an Allen key in the side opposite the threaded fixing hole. This serves to hold the axle steady while the fixing screw is being tightened with a second Allen key. On eccentric rollers, it also serves to adjust roller position, so as to reach the desired preload setting. Rollers for size 30 rails have a special central square pivot accessible with a flat key, inserted between slider body and eccentric rollers. The flat key is supplied by ROLLON.

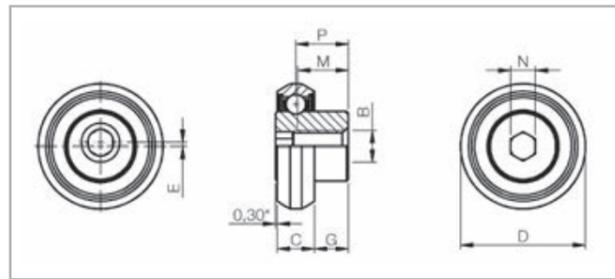


Fig. 37

Roller code	Type	Rail type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	P (mm)	N (Key)		B (mm)	Weight (g)	Dynamic load factor C (N)	Load capacity	
									Key	N (mm)				Co rad (N)	Co ax (N)
PCN26	concentric	T	-	20,2	6	8,5	5,5	8,2	4	4	M5	13	640	560	126
PEN26	eccentric		0,6												
PCN40	concentric	T	-	31,5	10	9,65	4,65	10	5	5	M6	48	1360	1200	410
PEN40	eccentric		0,7												
PCN40	concentric	U	-	31,5	10	9,65	4,65	10	5	5	M6	48	910	800	0
PEN40	eccentric		0,7												

Tab. 20

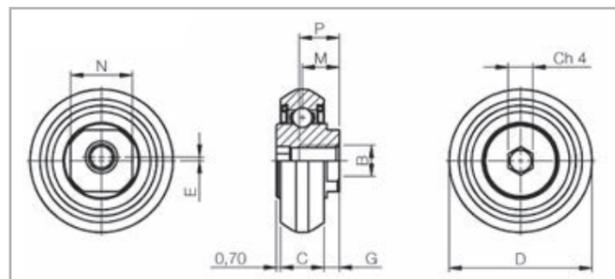


Fig. 38

Roller code	Type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	P (mm)	N (Key)		B (mm)	Weight (g)	Dynamic load factor C (N)	Load capacity	
								Key	N (mm)				Co rad (N)	Co ax (N)
PCN30	concentric	-	23,15	7	6	2,5	6,5	KLM28	10	M5	20	2400	1000	250
PEN30	eccentric	0,6												

Tab. 21

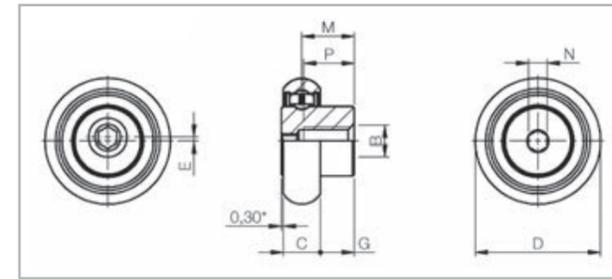


Fig. 39

Roller code	Type	E (mm)	D (mm)	C (mm)	M (mm)	G (mm)	P (mm)	N (Key)		B (mm)	Weight (g)	Dynamic load factor C (N)	Load capacity	
								Key	N (mm)				Co rad (N)	Co ax (N)
PCX26	concentric	-	20,3	6	8,5	5,5	8,2	4	4	M5	13	900	400	148
PEX26	eccentric	0,6												
PCX40	concentric	-	31,5	10	9,65	4,65	10	5	5	M6	48	1800	800	296
PEX40	eccentric	0,7												

Tab. 22

Drilling of roller supports

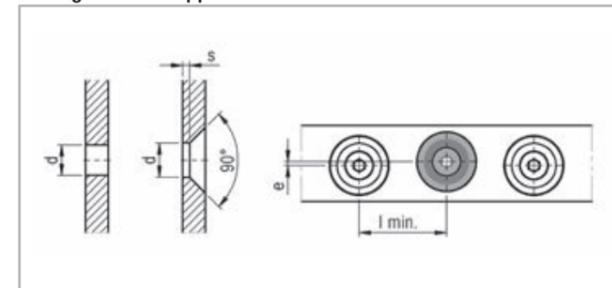


Fig. 40

Roller type	d (mm) Diameter of fixing screw hole	s (mm) Length of hole	e (mm) Hole alignment error	l _{min} (mm) recommended centre to centre distance
26	5 ⁰ _{-0,1}	1	0,2	22
30	5 ⁰ _{-0,1}	1	0,2	25
40	6 ⁰ _{-0,1}	1,5	0,4	34

Tab. 23

> **Lubrication and use of wipers**

All sliders are supplied complete with wipers containing a synthetic felt soaked in lubricating oil, which release a thin lubricating film on the raceways for long period of proper operation. The period of self-lubrication depends on conditions of use and level of environmental pollution.

In most normal conditions, the self-lubricating wipers can last up to 1000 km. They can be easily replaced with a replacement kit of 10 wipers. The rollers are lubricated for life with grease lithium soaps and with 2RS or 2Z lateral seals.

Correct lubrication is very important to ensure a long lifetime. For applications with high frequency is recommended to clean and re-grease the rail's raceways periodically every year or every 200,000 cycles, depending on the operation environment.

We recommend using high pressure grease fat class NLGI2(ISO2137)

Kit code	Rail reference	Slider reference
KIT-KT-LA26	TEN26	CEN26
KIT-KT-LA30	TEN30	CEN30
KIT-KT-LA40	TEN40	CEN40
	TEX40	CEX40
	TES40	CES40

Tab. 24

Every kit is composed of 10 single wipers.

> **Sizing verification**

After identifying the most appropriate positioning of rails and sliders, or eventually the single rollers, it is necessary to verify the proper sizing of the linear components. This both from a static point of view and in accordance to the expected life-time. For the static verification it is necessary to determine the load on each slider or roller, to identify the most stressed one, and then to verify the values of the safety coefficients, while comparing with the max. nominal load capacities. When the applied load is a combination of loads; radial and/or axial loads and moments, it is necessary to determine the value of each factor and verify that:

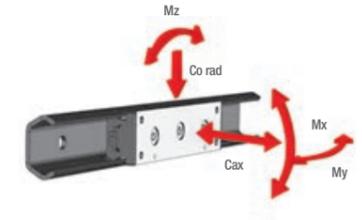
$$\frac{P_{ax}}{C_{o\ ax}} + \frac{P_{rad}}{C_{o\ rad}} + \frac{M_{ex}}{M_x} + \frac{M_{ey}}{M_y} + \frac{M_{ez}}{M_z} \leq \frac{1}{Z}$$

Fig. 41

Pax	=	axial load component
Prad	=	radial load component
Mex, Mey, Mez	=	applied moments
Co ax	=	axial load capacity
Co rad	=	radial load capacity
Mx, My, Mz	=	resistance capacity to moments
Z	=	safety coefficient > = 1

Fig. 42

LOAD DIRECTION



NOTE: Co rad, the radial load capacity for the sliders is to be understood only in direction shown on the slider body with two circular imprints.

It is recommended to apply the following values to safety coefficient Z:

Z	Application conditions
1-1,5	Accurate determination of static and dynamic loads. Precise assembly, tight structure.
1,5-2	Average conditions
2-3,5	Insufficient determination of applied loads. Vibrations, loose structure. Imprecise assembly. Unfavourable environmental conditions.

Tab. 25

Theoretical lifetime calculation

The theoretical life of rollers and raceways should be determined by the conventional formula as indicated below in km of running. However, it should be kept in mind, that the value thus calculated must be taken with caution just for orientation. In fact, the real service life achieved can be very different from that calculated value, because the phenomena of wear and fatigue are caused by factors not easy to predetermine, for example:

- Inaccuracy in the estimation of the real loading condition
- Overloading for inaccuracies assembly
- Vibration, shock and dynamic pulse stress
- Raceways status of lubrication
- Thermal excursions
- Environmental pollution and dust
- Damage mounting
- Stroke length and frequency of movement

$$L (Km) = 100 \cdot \left(\frac{C}{P} \cdot \frac{f_c}{f_i} \cdot f_h \right)^3$$

Fig. 43

C = Dynamic load coefficient of slider
 P = The equivalent load applied on the most stressed slider

Fig. 44

f_h	=	Coefficient depending on the actual stroke length. This factor takes into account applications with short stroke. With value 1 the stroke is superior to 2m, with shorter stroke the value is less, refer to "Coefficient f_h " graphic.
f_c	=	Coefficient depending on the number of sliders in the same rail passing the same raceway point. Refer to the table below for suggested values
f_i	=	Coefficient taking into account operational ambient and level of correct lubrication of raceways

Fig. 45

Number of sliders	1	2	3	4
f_c	1	0.8	0.7	0.63

Tab. 26

The equivalent load applied on the most stressed slider = P , is determined by the formula:

$$P = Prad + \left(\frac{P_{ax}}{Co_{ax}} + \frac{M_{ex}}{M_x} + \frac{M_{ey}}{M_y} + \frac{M_{ez}}{M_z} \right) \cdot Co_{rad}$$

Fig. 46

Coefficient f_h

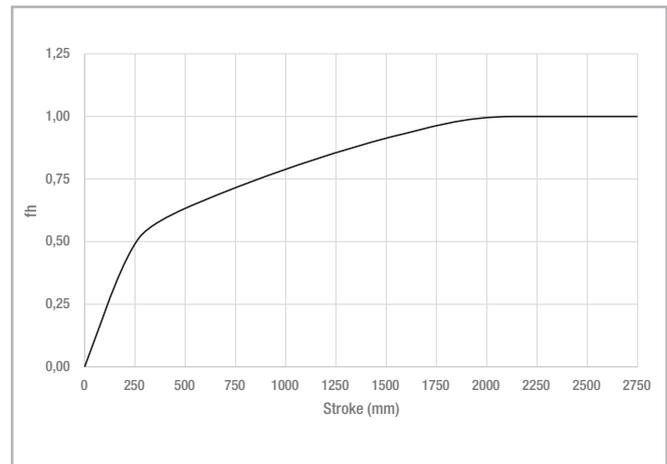


Fig. 47

The correction factors f_c and f_i applied to the theoretical calculation formula have the sole purpose of guiding the designer qualitatively on the influence in the lifetime estimation of the real application conditions without any pretense of precision. For more details please contact Rollon's Technical department

f_i	Application conditions
1-1.5	Good lubrication and wipers mounted – No impurities on raceways – Correct installation.
1.5-2	Normal dusty factory ambient, some vibrations, temperature changes, no wipers.
2-3.5	Poor Lubrication, dusty ambient, vibrations, high temperature changes, no wiper.

Tab. 27