



# ***HepcoMotion®*** ***SL2***

***STAINLESS STEEL  
SLIDE SYSTEM***



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Additional information can be viewed within the online SL2 Technical Guide when you click this icon:



To assist browsing this catalog online, clicking wherever you see blue hypertext or page number, will take you directly to the section required:

Cap Seals



Where other HepcoMotion product ranges are referred to, clicking on the title will take you to the catalog in question:

**HDS2 Heavy Duty  
Linear Guide**

The full contents of the SL2 Technical Guide can be viewed or downloaded by clicking this icon:

New additions and catalog amendments can also be found here.



# SL2 Stainless steel linear guide











**Smooth – Quiet – Corrosion resistant**






**Accurate – Fast – Suitable in harsh environments**





A corrosion resistant, stainless steel linear guide system for use in food and medical industries or corrosive environments.



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System Assembly & Adjustment	
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## Stainless Steel Linear Motion System with Standard Bearings

INDIVIDUAL COMPONENTS,  
OR FULLY-ASSEMBLED  
AND ADJUSTED SYSTEMS,  
READY TO INSTALL

### ALL SLIDES (COMMON FEATURES) 18-22

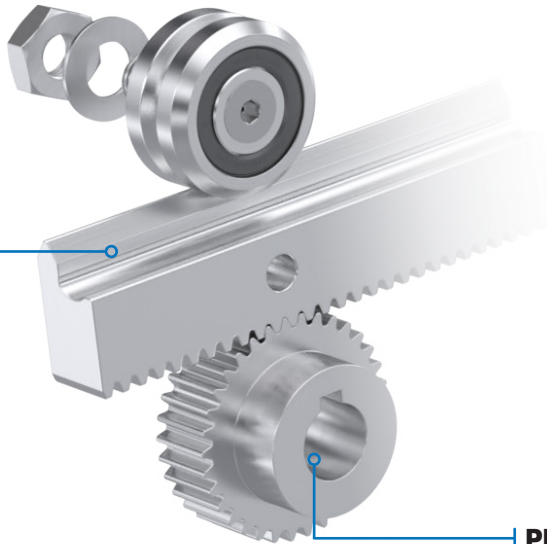
- Precision ground for high accuracy and corrosion resistance.
- One piece construction for assured parallelism and rigidity.
- Manufactured from bearing grade stainless steel.
- Deep hardened 'V' faces for maximum wear resistance.
- Soft center section allows customizing.
- Any length supplied up to 4 meters.
- Unlimited length achieved by butting.
- Common 70° 'V' allows many Bearing/Slide combinations.

### BLIND HOLE BEARING 24-25

- For mounting into thick plates or where access to opposite side is restricted.
- Bearing grade stainless steel.
- Eccentric version adjusted from operating side, for ease of access.
- Concentric version (shown on opposite side of the Slide) has threaded axle and locates into tapped hole in the mounting surface.

### SINGLE EDGE SPACER SLIDE 20-21

- Mounts directly to a flat surface. No spacer required.
- Can be spaced apart for high moment load capacity.
- Back face provides mounting register, or running surface for Track Roller.
- Datum edges provide means of location and alignment.
- Rack cut option provides means of driving.
- Counterbored holes, tapped holes or undrilled options available.



### PINION 33

- Stainless steel.
- Hardened teeth for long life.

### DOUBLE EDGE FLAT SLIDE 22

- Lower weight for less inertia where Slide is the moving component.
- Lower cost in cases where spacer is part of customer's construction.
- Plain hole, or counterbored fixing option for flush top surface.



## SEE APPLICATION EXAMPLES SECTION FOR DESIGN IDEAS

### STANDARD CARRIAGE 16-17

- Factory adjusted to chosen Slide, if required.
- Carriage Plate available as an individual item, for self assembly.
- Useful size platform with flush surface and tapped holes for mounting purposes.
- Available with Bearings only, or with the addition of Cap Seals or Lubricators.
- Controlled height option for special accuracy requirements.
- High strength, lightweight aluminum alloy with corrosion resistant coating better than most stainless steels and approved by the U.S Dept. of Agriculture.

### LUBRICATOR 27

- Lubricates contact surfaces, increasing load capacity and life.
- Long lubrication interval.
- Lightly sprung felt wiper ensures low friction.
- Can be attached from either side of a Carriage.
- Plastic construction with stainless steel fasteners.

### DOUBLE EDGE SPACER SLIDE 18-19

- Mounts directly to a flat surface. No spacer required.
- Keyway and datum edges provide means of location and alignment.
- Can be supplied with Rack mounted on top surface.
- Counterbored hole fixing, tapped hole fixing or undrilled options available.

### CAP SEAL 26

- Lubricates contact surfaces, increasing load capacity and life.
- Lubricated for life in most applications.
- Sealed against ingress of debris.
- Improves operational safety.
- Incorporates both through hole and tapped hole fixing facility.
- Plastic construction with stainless steel fasteners.

### DOWEL PIN 19

- Stainless steel.
- Easy method of location and alignment.

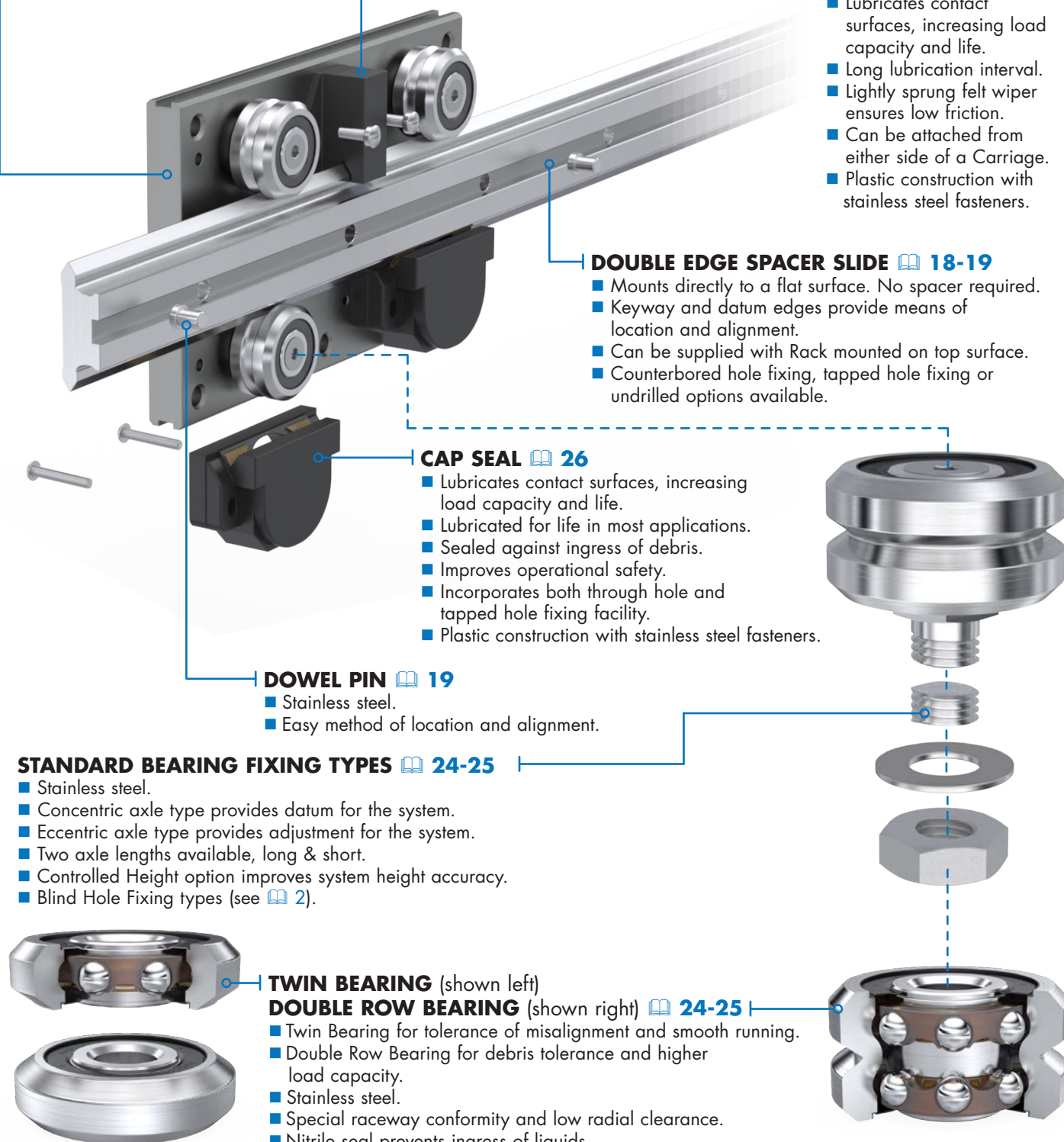
### STANDARD BEARING FIXING TYPES 24-25

- Stainless steel.
- Concentric axle type provides datum for the system.
- Eccentric axle type provides adjustment for the system.
- Two axle lengths available, long & short.
- Controlled Height option improves system height accuracy.
- Blind Hole Fixing types (see 2).

### TWIN BEARING (shown left)

### DOUBLE ROW BEARING (shown right) 24-25

- Twin Bearing for tolerance of misalignment and smooth running.
- Double Row Bearing for debris tolerance and higher load capacity.
- Stainless steel.
- Special raceway conformity and low radial clearance.
- Nitrile seal prevents ingress of liquids.
- Lubricated for life internally.



## Linear Motion System with Flat Track & Rollers

### TRACK ROLLERS (COMMON FEATURES) 29-31

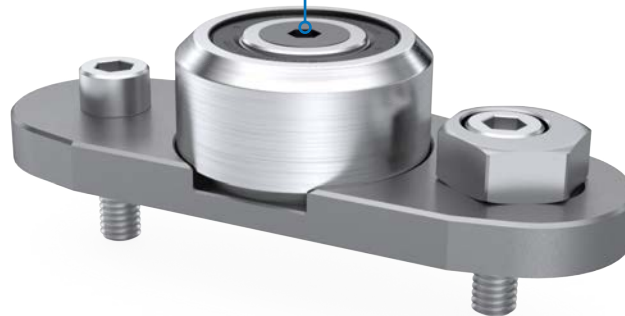
- Size and load capacity equivalent to Hepco 'V' Bearings.
- Bearing grade stainless steel.
- Special raceway conformity with low radial clearance.
- Crowned running face for tolerance of misalignment.
- Nitrile seals prevent ingress of liquids.
- Designed to run on Flat Track or back face of Single Edge Spacer Slides.

### NARROW TRACK ROLLER 29

- Suitable for running on any flat surface.
- Can be used as a retaining roller on the rear face of the Single Edge Spacer Slides.
- Available in Concentric and Eccentric axle types.

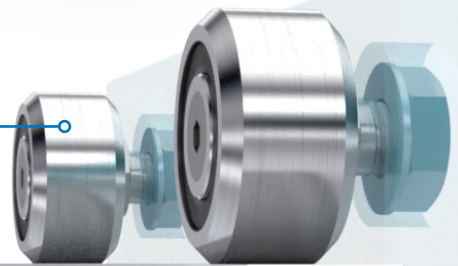
### BLIND HOLE WIDE TRACK ROLLER 30-31

- For mounting into thick plates or where access to opposite side is restricted.
- Adjustable from operating side, for ease of access.
- Concentric axle type    ■ Eccentric axle (adjustable) type



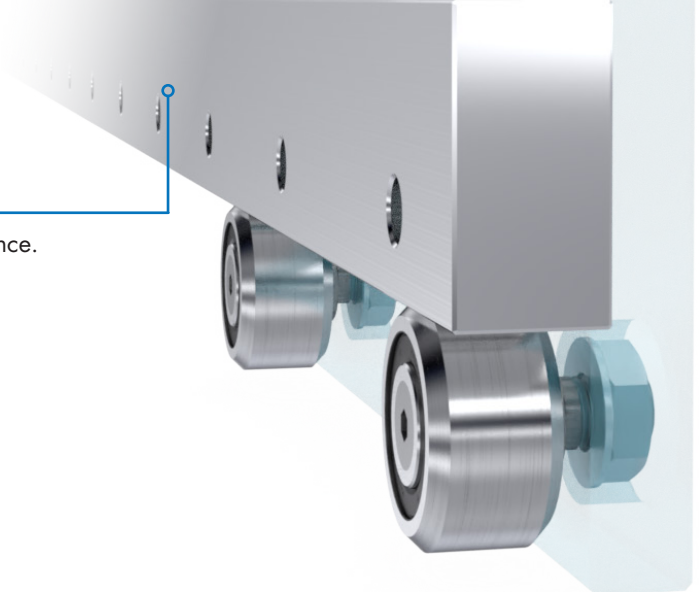
### WIDE TRACK ROLLER 30-31

- Concentric axle type provides datum for the system.
- Eccentric type provides adjustment for the system.
- Two axle lengths available, long & short.



### FLAT TRACK 28

- Precision ground for high accuracy and corrosion resistance.
- Deep hardened faces for maximum wear resistance.
- Manufactured from bearing grade stainless steel.
- Offset fixing holes for versatility of mounting.
- Three useful sizes compatible with Hepco 'V' Slides.
- Any length supplied up to 4 meters in most sizes.
- Unlimited length achieved by butting.



SEE APPLICATION  
EXAMPLES SECTION  
FOR DESIGN IDEAS

## Ancillary Components

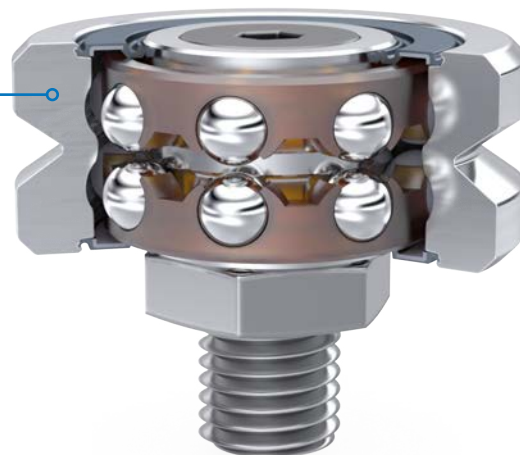
SEE APPLICATION  
EXAMPLES SECTION  
FOR DESIGN IDEAS

### AXIAL STIFFNESS BEARING

↓ [SL2 Technical Guide](#)

- Bearing grade stainless steel.
- Stiffer under Axial load.
- Interchangeable with standard SL2 size 25 and 34 bearings.
- Nitrile seals to prevent ingress of debris.

See Application Examples [12](#)

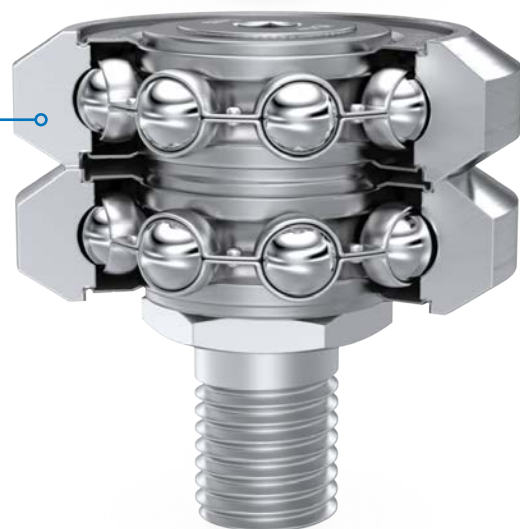


### VACUUM AND EXTREME TEMPERATURE BEARING

↓ [SL2 Technical Guide](#)

- All stainless steel construction.
- Grease types for either extreme high temperature or extreme low temperature applications.
- Available in most SL2 sizes including Blind Hole Fixing versions.
- Also available in Track Roller format.
- Stainless steel shields to prevent ingress of dirt.

See Application Examples [8](#)

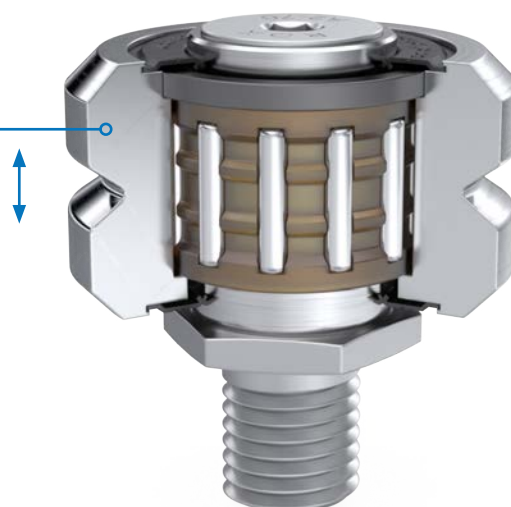


### FLOATING BEARING

↓ [SL2 Technical Guide](#)

- Provides axial movement (float) of the 'V' position to compensate for parallelism error when two Slides are mounted in parallel.
- Caged needle roller bearing for high speed operation.
- Bearing grade stainless steel.
- Nitrile seals to prevent ingress of debris.
- Lubricated for life internally.

See Application Examples [8](#)



## Ancillary Components

### INDIVIDUAL COMPONENTS, OR FULLY-ASSEMBLED AND ADJUSTED SYSTEMS, READY TO INSTALL

#### REMOVABLE CARRIAGE [↓ SL2 Technical Guide](#)

- Most sizes of Removable Carriage offered in the GV3 non-stainless steel linear system range are also available in stainless steel – corrosion resistant SL2 format. Please contact our technical department for details.
- Incorporates Double Eccentric Bearings to enable complete removal of the Carriage. Especially useful where ends of the Slide are blocked preventing withdrawal of the Carriage.

#### END STOP [📖 23](#)

- Provides a physical stop to the linear movement and impact protection should a system overrun.
- Conical buffer provides a controlled deceleration to the Carriage to protect the system and payload.
- May be positioned anywhere along the length of a Slide for maximum flexibility.

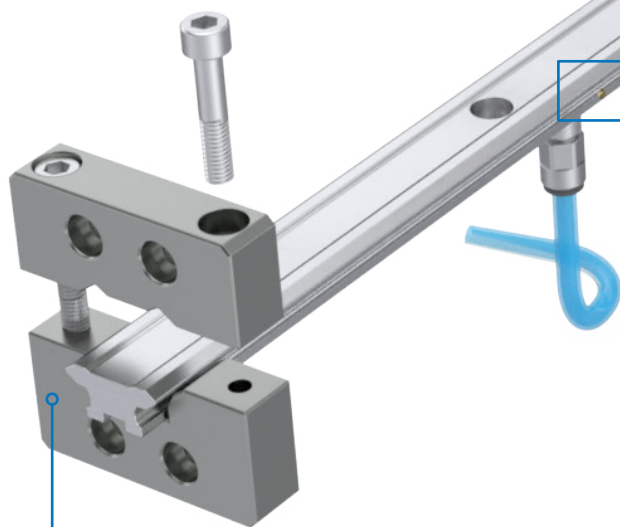
See Application Examples [📖 12](#)

#### CARRIAGE LOCKING DEVICE

[↓ SL2 Technical Guide](#)

- Provides a safe and simple method of manually locking a Standard Carriage in position to facilitate processes where a secure, stationary platform is required.

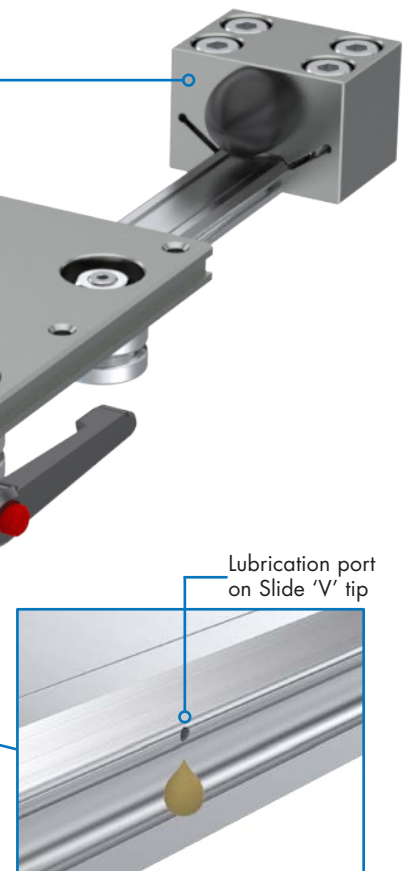
See Application Examples [📖 8 & 12](#)



#### FLANGE CLAMP [↓ SL2 Technical Guide](#)

- Enables Slide to become a self supporting beam.
- Two mounting possibilities, face fixing or base fixing.
- Easy removal of Slide and positive relocation.
- Available in long and short type, to support a Slide at one or both ends.

See Application Examples [📖 8 & 9](#)



#### BLEED LUBRICATION

[↓ SL2 Technical Guide](#)

- Channels lubricant directly to the 'V' surface of Slides.
- For connection to any centralized lubrication system, dispensing pump and controller or pressure feed canister.

ANCILLARY COMPONENTS ARE  
CONSTRUCTED FROM MATERIALS  
WITH A HIGH DEGREE OF  
CORROSION RESISTANCE.




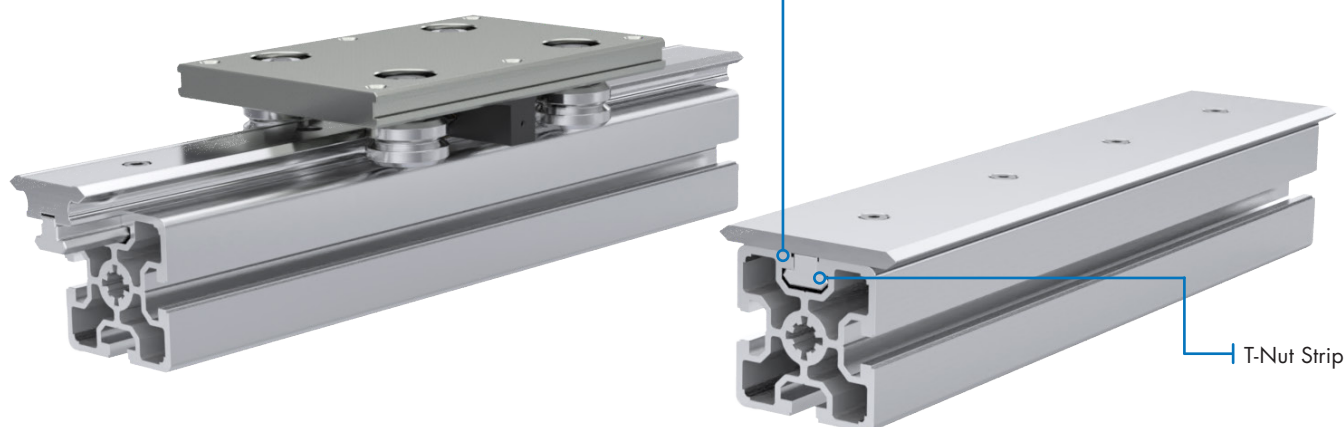
SEE APPLICATION  
EXAMPLES SECTION  
FOR DESIGN IDEAS

### MCS-SL2 CONNECTIVITY

#### ↓ SL2 Technical Guide

- SL2 Spacer Slides and Flat Slides can be mounted to **Hepco MCS (Machine Construction System)** profiles.
- Can be supplied factory-assembled, ready for installation.
- Hepco T-Nut Strip provides a location for Spacer Slides and retains fastener positions in the event of disassembly.
- Comprehensive range of aluminum profiles and Slide mounting combinations available, including Single Edge Slides.

See Application Examples  8 & 11

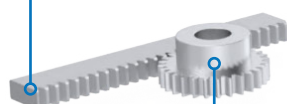


### CUSTOM RACK DRIVEN CARRIAGE

- Special Corrosion Resistant carriages to suit customers motor, gearbox and drive arrangement.
- Please contact Bishop-Wisecarver's technical sales team to discuss your requirement.

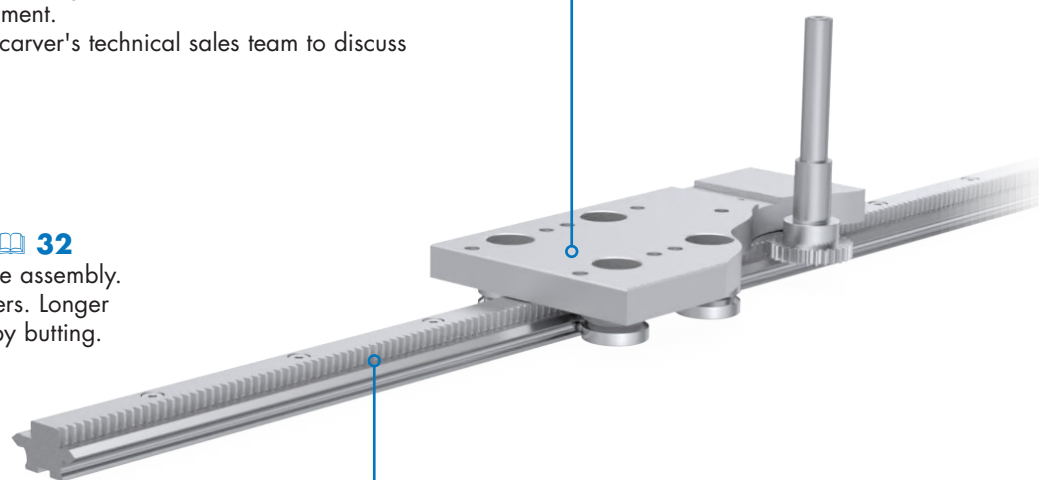
#### SEPARATE RACK 32

- As used in Rack-Slide assembly.
- Lengths up to 4 meters. Longer lengths achievable by butting.



#### PINION 33

- Stainless steel.
- Hardened teeth for long life.



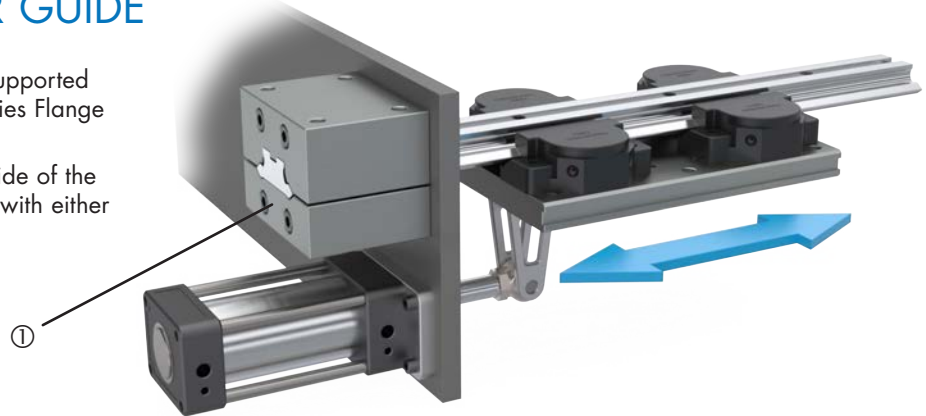
#### RACK-SLIDE ASSEMBLY 18-19

- Dowelled Rack-Slide assembly is ready to fix to the mounting surface.
- Slides with compound Racks available up to 4 meters.
- Unlimited Rack-Slide length achieved by butting.

## CANTILEVERED LINEAR GUIDE

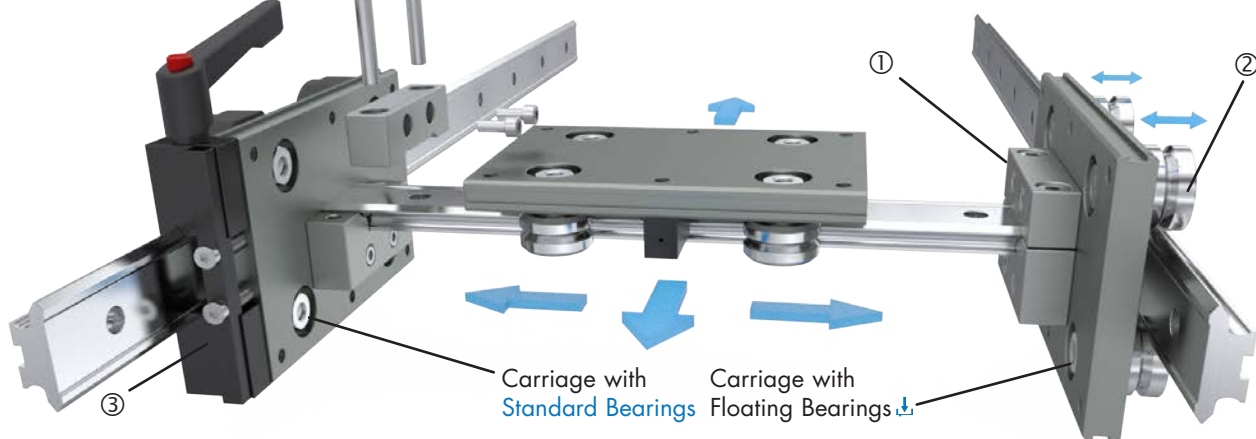
Short stroke sliding movements may be supported from one end only, using Hepco long series Flange Clamps ①.

Flange Clamps may be bolted to either side of the supporting framework and are available with either through holes or tapped holes.



## SIMPLE TWO AXIS CONNECTION

Hepco short series Flange Clamps ① are an ideal method of connecting opposing Carriages and creating a second axis that can be easily installed or removed. To overcome the necessity to set opposing Slides parallel, Floating Bearings ② are used on one side. The left-hand Carriage is shown with a Carriage Locking Device ③, which enables it to be secured and locked into position.

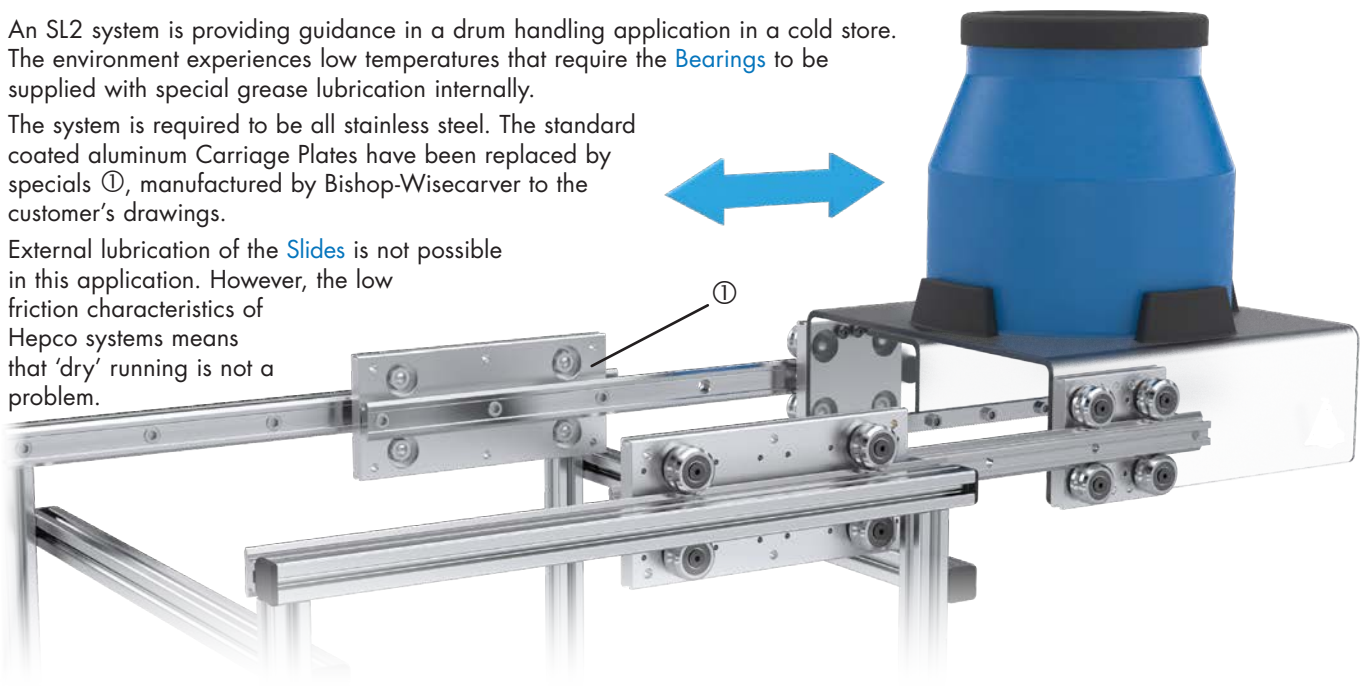


## A TELESCOPIC HORIZONTAL GUIDANCE OF HAZARDOUS MATERIAL DRUM

An SL2 system is providing guidance in a drum handling application in a cold store. The environment experiences low temperatures that require the Bearings to be supplied with special grease lubrication internally.

The system is required to be all stainless steel. The standard coated aluminum Carriage Plates have been replaced by specials ①, manufactured by Bishop-Wisecarver to the customer's drawings.

External lubrication of the Slides is not possible in this application. However, the low friction characteristics of Hepco systems means that 'dry' running is not a problem.



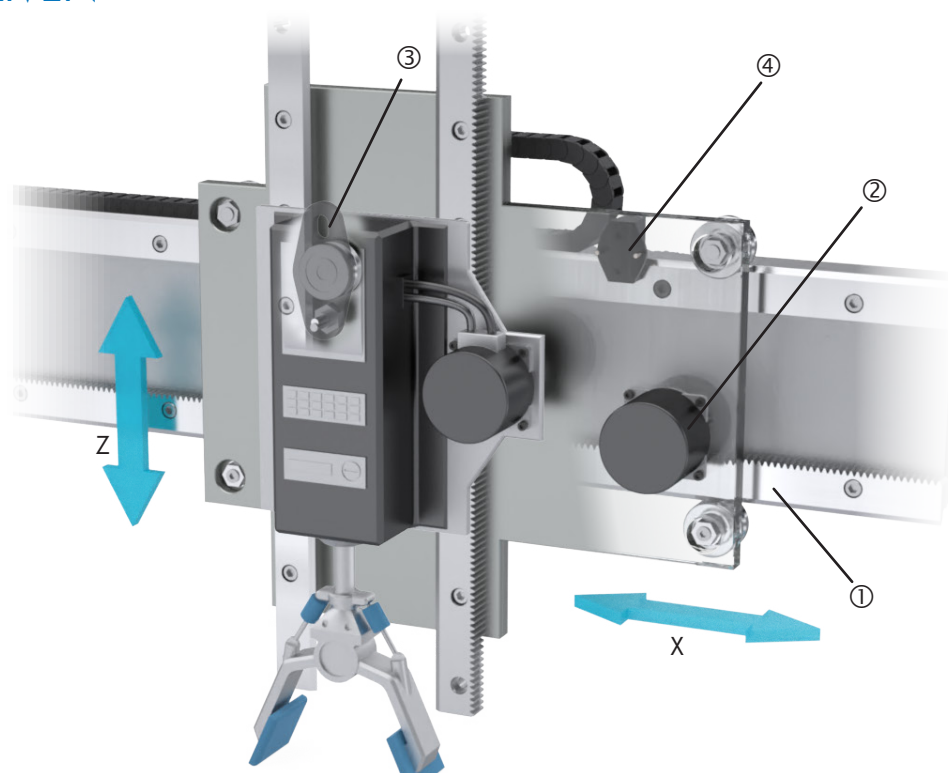
## COMPACT RACK DRIVEN X-Z MOVEMENT

**X axis:** Outward facing SL2 Single Edge Spacer Slides

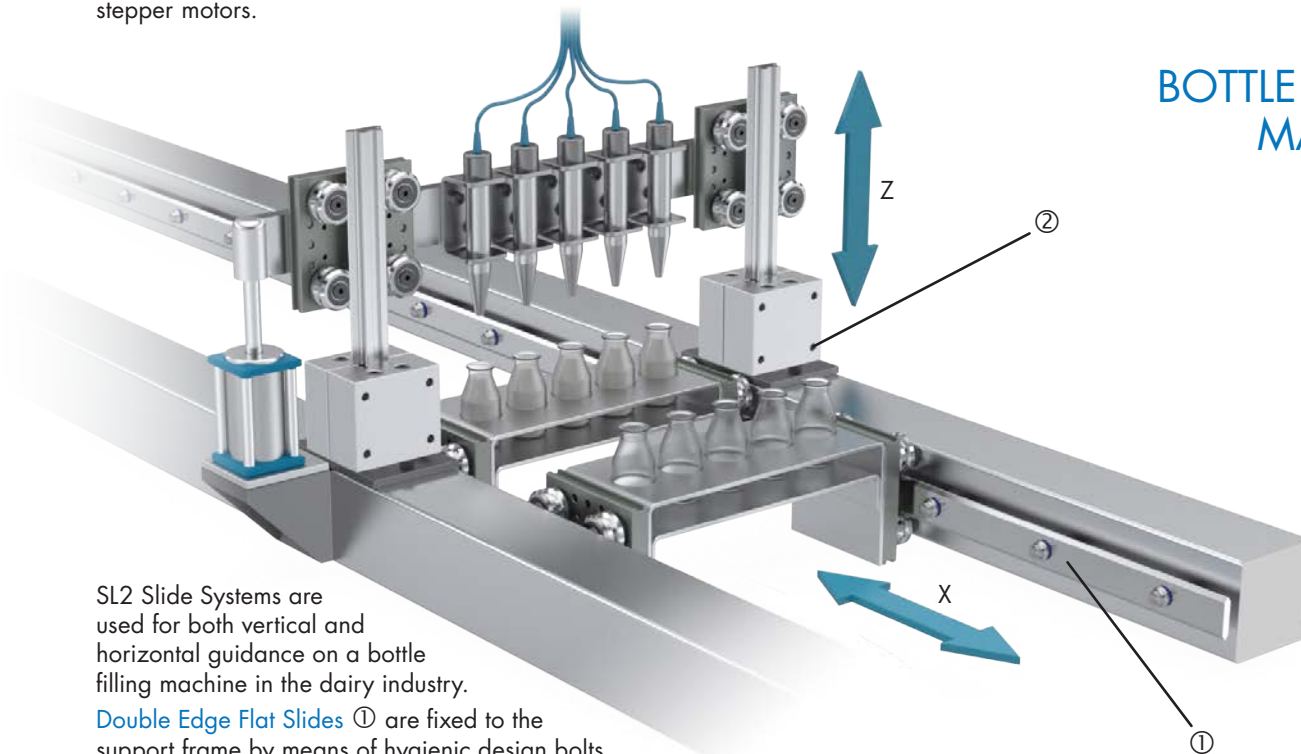
①, with a precision rack machined into the back face, are mounted sufficiently far apart to provide the required rigidity and to accommodate the drive Pinion ②. A compact design is achieved by mounting the Bearings ③ on a common plate, which also supports the Slides for the Z axis.

**Z axis:** Inward facing SL2 Single Edge Spacer Slides allow the motor and drive Pinion to be accommodated adjacent to the gripper housing. Blind Hole Fixing Bearings ③ are used, as through hole fixing is not possible.

Slide Lubricators ④ are used throughout to minimize friction and the risk of stalling the stepper motors.



## BOTTLE FILLING MACHINE



SL2 Slide Systems are used for both vertical and horizontal guidance on a bottle filling machine in the dairy industry.

Double Edge Flat Slides ① are fixed to the support frame by means of hygienic design bolts and cylindrical spacers, which prevent debris being trapped and enable easy washdown.

Spacer Slides on the short vertical axis are secured to the frame by long series Flange Clamps ②, with the Slides being sufficiently rigid to not require supporting at both ends

Care has been taken to ensure parallelism of opposing Slides during installation. Twin type Bearings can be used in cases where there may be slight misalignment of opposing Slides.



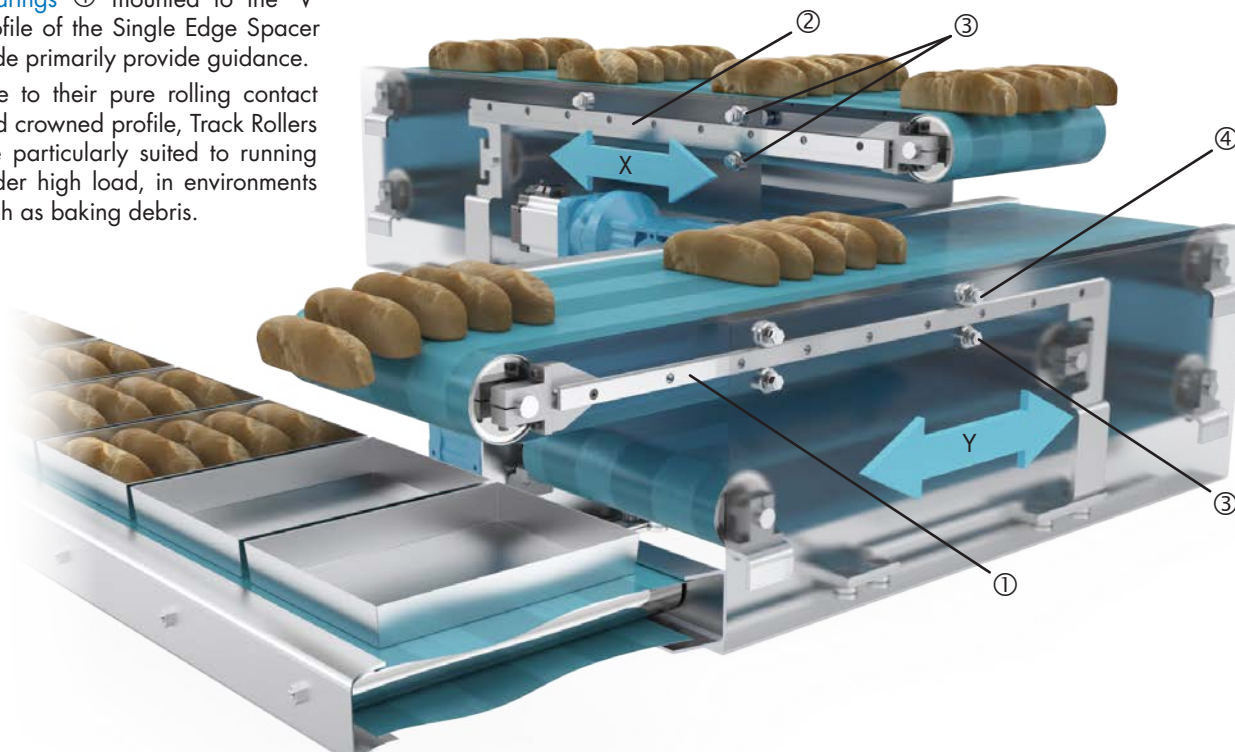
## AUTOMATIC CONVEYOR SYSTEM

Hepco SL2 is used in this retractable conveyor system for the food industry. The conveyors extend and retract to route and deposit the product. Both the X and Y axes combine **Single Edge Spacer Slide** ① with an opposing **Flat Track** ②, which allows the system to be mounted to the framework with tolerance for imperfection in parallelism between the two tracks.

**Track Rollers** ③ run on the Flat Tracks and the large rear face of the Single Edge Spacer Slides.

**Bearings** ④ mounted to the 'V' profile of the Single Edge Spacer Slide primarily provide guidance.

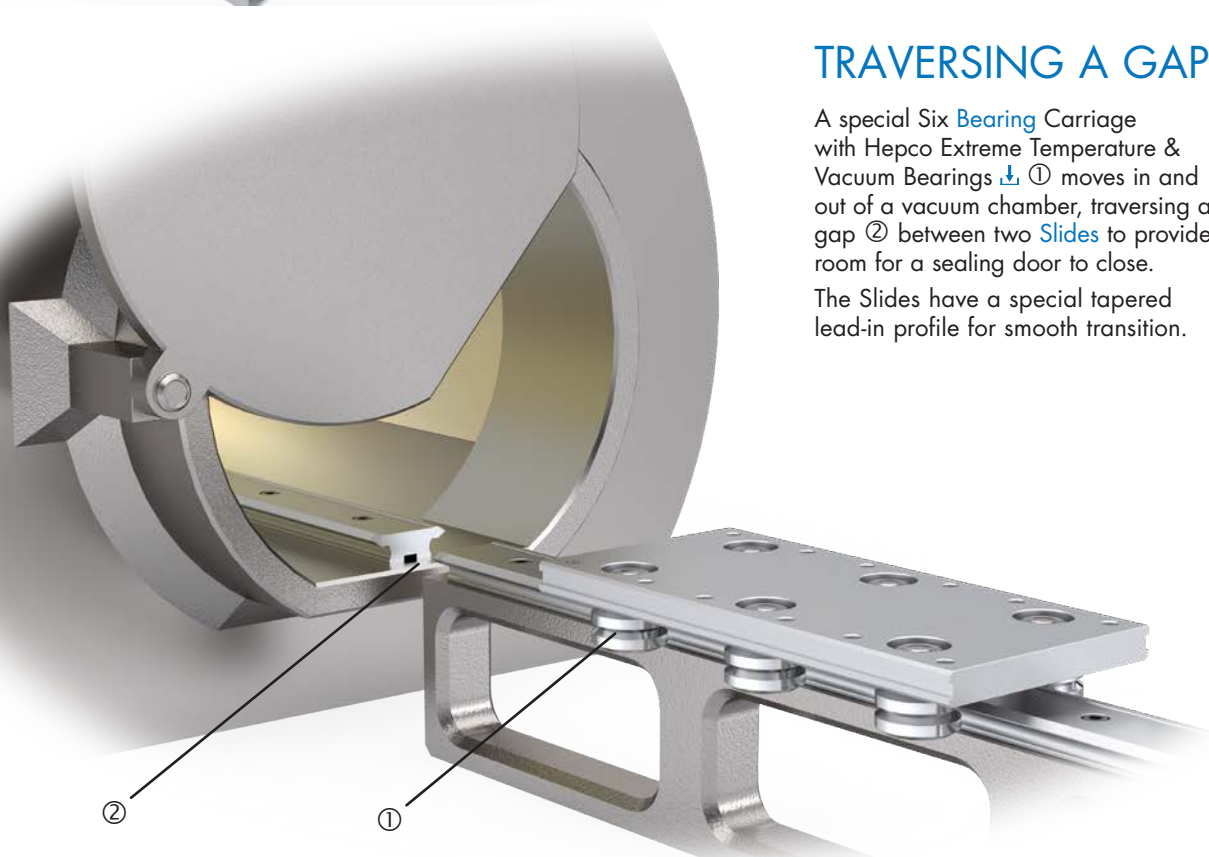
Due to their pure rolling contact and crowned profile, Track Rollers are particularly suited to running under high load, in environments such as baking debris.



## TRAVERSING A GAP

A special Six **Bearing Carriage** with Hepco Extreme Temperature & Vacuum Bearings ① moves in and out of a vacuum chamber, traversing a gap ② between two **Slides** to provide room for a sealing door to close.

The Slides have a special tapered lead-in profile for smooth transition.





## ULTRASONIC FOOD CUTTER

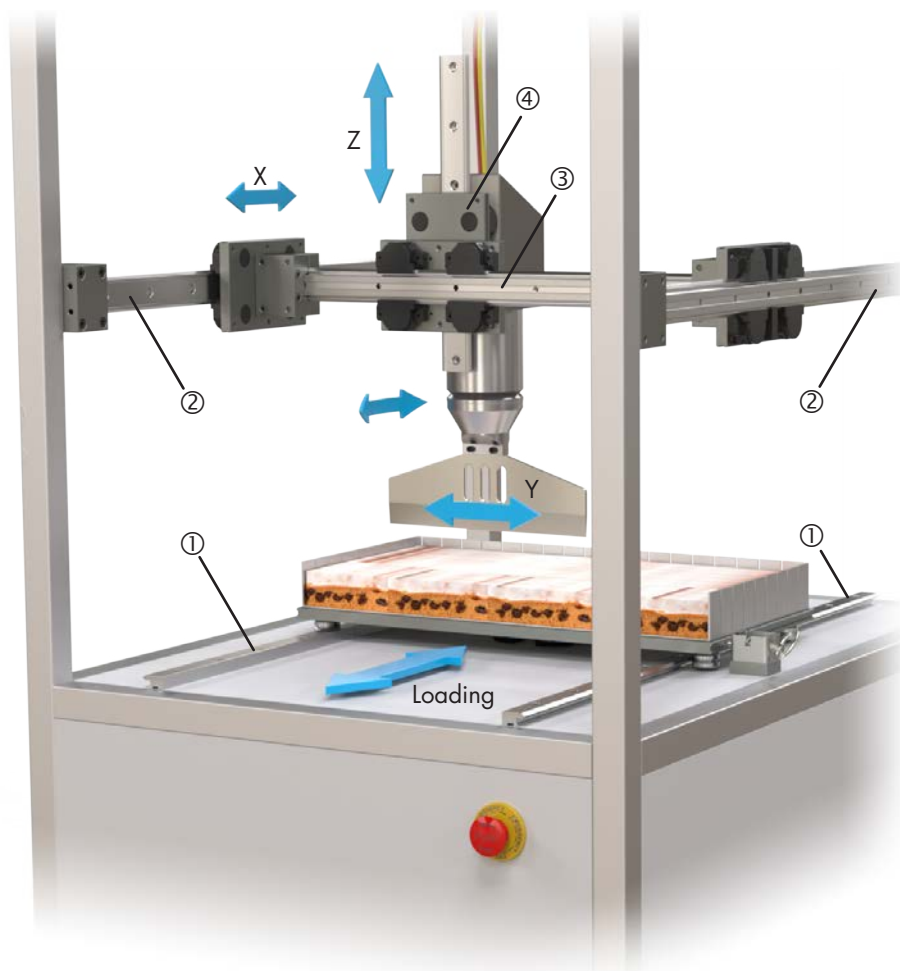
This application shows an industrial ultrasonic cutter dividing a large cake into smaller portions.

**Loading:** The cake platen, which forms the carriage, is manually loaded into a fixed position guided by two SL2 [Single Edge Spacer Slides](#) spaced wide apart ①.

**X axis:** [Double Edge Spacer Slides](#) ② mounted in parallel, operate in conjunction with their counterpart Y axis Slides ③ to position the blade ready for cutting.

**Z axis:** The Y axis carriage ④ incorporates a second set of bearings achieving a common carriage for both Y and Z axes. The Z axis [Double Edge Spacer Slide](#), to which the cutting assembly is mounted, moves down vertically within the stationary carriage to cut the cake.

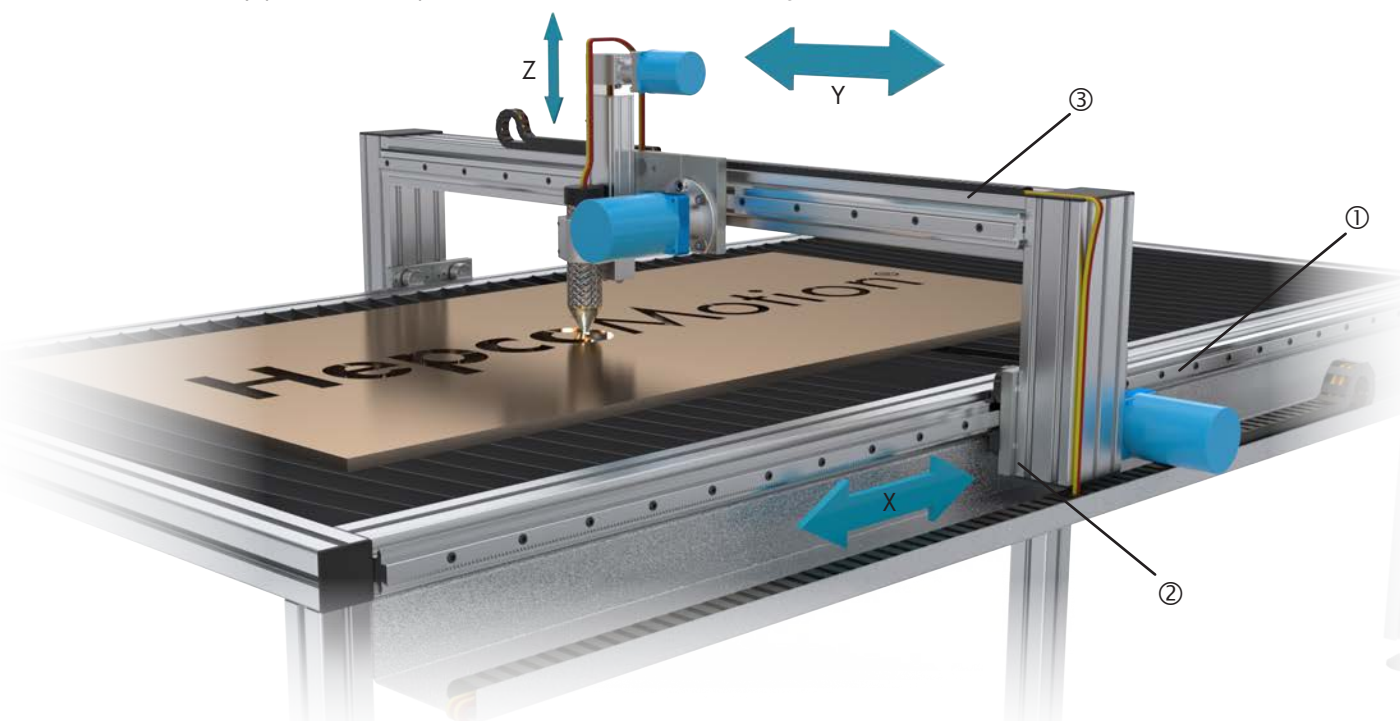
A motorized rotary axis enables cutting in both directions.



## CNC PLASMA CUTTER

The plasma cutter is able to move in all X, Y and Z directions using SL2 [Double Edge Spacer Slides](#) with mounted rack ①. This ensures both rigidity and a high degree of accuracy. Custom Rack Driven Carriages ② have been designed to accommodate SL2 Drive [Pinions](#), customer's specified motors and micro-adjustment feature to achieve correct mesh.

Hepco [MCS Machine Construction System](#) ③ is used for the aluminum framework and supporting members. The T-nut strip with location facility provides a simple and secure method for attaching the Slides.



## SAW BLADE INSPECTION

A stainless steel **PRT2** Ring Segment ① is used in combination with an SL2 linear guide to produce a measuring instrument for checking tooth geometry on circular saw blades.

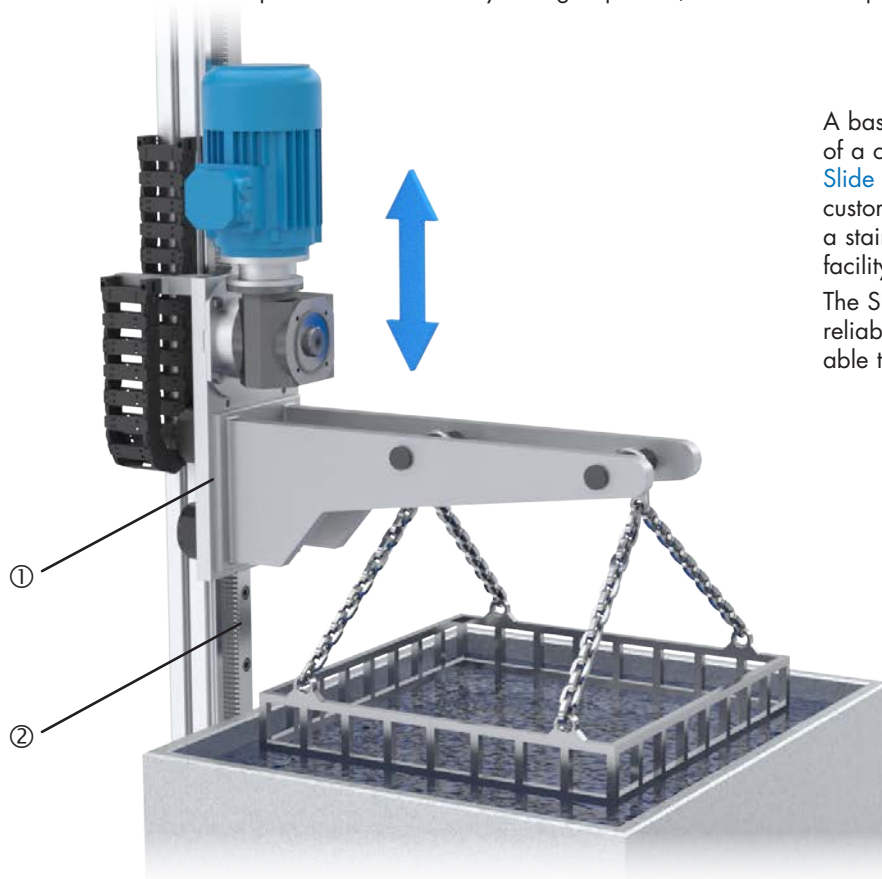


For maximum precision and rigidity, a standard SL2 **Carriage Plate** is used, incorporating stainless steel Hepco Axial Stiffness Bearings ⬇️ ②. A Carriage Locking Device ⬇️ ③ is used to keep the saw blade steady during inspection, while an End Stop ④ retains the Carriage on the **Slide**.

## DIPPING VAT

A basket of parts is lowered into a vat by means of a custom carriage ① and SL2 **Rack Mounted Slide** ②. The custom carriage is tailored to the customer's motor specification and supplied with a stainless steel **Pinion** and micro-adjustment facility for tooth engagement.






The SL2 stainless steel system is ideally suited for reliable operation in hostile environments and is able to withstand high transmission forces.



The customer has a wide choice of HepcoMotion SL2 components in order to satisfy most linear motion requirements.




To facilitate the selection process, the most commonly used components for a basic Slide System have been tabulated to show comparative benefits when used within a complete system.

The benefits in the table are the important ones, which can be shown in comparative form and are by no means exhaustive. Please see the System Composition section [2 – 7](#) and pages relating to the individual components for other features, benefits and variants.

Bearing Type	Load		Speed	Smoothness	Tolerance of Misalignment	Stiffness / Rigidity	Height* <sup>1</sup> +/-	Tolerance of Debris	Price
	☹️	😊	☹️	😊	☹️	😊	☹️	😊	☹️
 Twin Bearing									
 Double Row Bearing									
 Floating Bearing* <sup>2</sup>									
 Vacuum & Extreme Temp Bearing* <sup>3</sup>									
 Axial Stiffness Bearing* <sup>4</sup>									

#### Notes

1. Controlled height versions of Stainless Steel Bearings are available in restricted quantities. Minimizes height variation from mounting face to 'V' centerline. Useful in high precision applications.
2. Specially adapted for tolerance of misalignment when used in applications where two Slides are mounted in parallel.
3. Specifically for use in very high or low temperature applications.
4. Particularly stiff under axial load.

Lubrication Method	Load	Lubrication Interval	Debris Exclusion	Friction	Safety & Appearance	Price
	☹️	😊	☹️	😊	☹️	😊
<b>None</b>			*			
 Lubricators			*			
 Cap Seals						
 Hepco Bleed Lubrication		Automatic lube frequency possible 	*			

\*The Hepco 'V' Bearing principle has a natural wiping action which tends to expel debris.

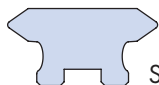
The above information is a general guide intended for preliminary selection purposes only.

SHOWN HERE ARE FULL SIZE ILLUSTRATIONS OF ALL SLIDES, ALL BEARINGS AND SOME OF THE MORE POPULAR ASSEMBLED CARRIAGES.

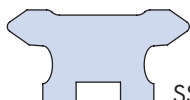
ALSO SHOWN ARE FLAT TRACKS AND TRACK ROLLERS, WITH ROLLERS RUNNING ON EITHER THE NARROW OR WIDE FACES OF THE TRACK.



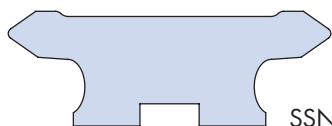
SSNMS12...



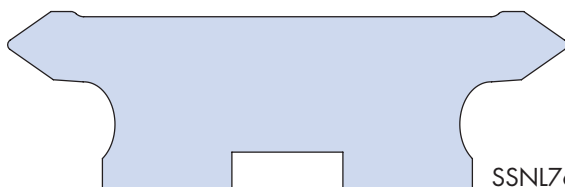
SSNV20...



SSNS25...



SSNM44...



SSNL76...



SSL76...



SSM76...



SSM60...



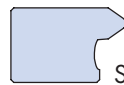
SSS50...



SSM44...



SSS35...



SSNVE...



SSS25...



SSNSE...



SSV20...



SSNME...



SSMS12...



SSNLE...

SSLRN18...  
(Ø18)

SSFT2412

SSSR18...  
(Ø18)

Long axle version also available

AUSS7654 Carriage

SS...J54...  
(Ø54)

SSNL76...

SSLRN25...  
(Ø25)

SSFT3216

SSSR25...  
(Ø25)

Long axle version also available

AUSS4434 Carriage

SS...J34...  
(Ø34)

SSNM44...

SSLRN34...  
(Ø34)

SSFT4020

SSSR34...  
(Ø34)

Long axle version also available

AUSS2525 Carriage

SS...J25...  
(Ø25)

SSNS25...

AUSS2018 Carriage

SS...J18...  
(Ø18)

SSNV20...

AUSS12 Carriage

SS...J13...  
(Ø12.7)

SSNMS12...

HepcoMotion Standard SL2 Carriages are available to suit all sizes of stainless steel [Double Edge Slides](#). Carriage Plates are precision machined from aluminum alloy and are supplied with a proprietary U.S. Dept. of Agriculture approved coating providing corrosion resistance better than many stainless steels. Fully stainless steel carriages are available to special order according to materials available.

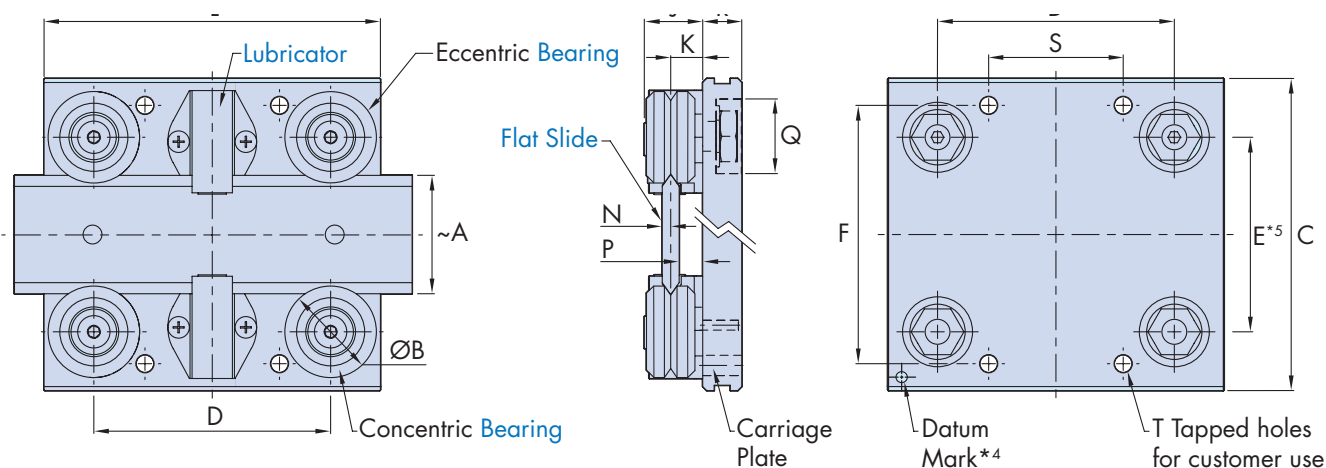
Carriages may be specified as **Assembled Units (AU Type)**, either factory set to the chosen Slide, or without Slide for self-adjustment.

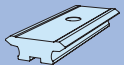
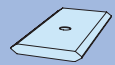
The following types of [Bearing](#) and [Lubrication Device](#) may be specified.

**The Twin Bearing type** which is the default choice, comprises two individual Bearings on a common axle. This offers some compliance, smoother running, easy adjustment and greater tolerance of misalignment.

**The Double Row Bearing type (DR)** incorporates a one piece bearing with two ball tracks. This offers higher load capacity, especially in the radial direction and is less susceptible to entrapment of debris\*<sup>6</sup>.

## Example: Short Carriage with Lubricators on a Flat Slide



Part Number	Use With		~A	ØB	C	E*5	F	G	H	J	K	M	N	P	Q	
																
AU SS MS 12 ...	SS NMS 12	SS MS 12	12	13	40	22	30	19.06	-	10.1	5.46	-	1.53	3.8	12.5 x 4.8	
AU SS V 20 ...	SS NV 20	SS V 20	20	18	64	34.7	50	24.75	14	12.4	6.75	56.3	2.14	4.5	16 x 7	
AU SS S 25 ...	SS NS 25	SS S 25	25	25	80	46.4	64	30.5	18	16.6	9	76.8	2.39	6.5	22 x 8.4	
AU SS S 35 ...	-	SS S 35	35		95	56.4	80	-				86.8			22 x 9.4	
AU SS S 50 ...	-	SS S 50	50		112	71.4	95	-				101.8			22 x 10.9	
AU SS M 44 ...	SS NM 44	SS M 44	44	34	116	72.3	96	38.5	22.5	21.3	11.5	113.1	3.14	8.3	25 x 8.7	
AU SS M 60 ...	-	SS M 60	60		135	88.3	115	-				129.1			25 x 11	
AU SS M 76 ...	-	SS M 76	76		150	104.3	130	-				145.1			25 x 12.5	
AU SS L 76 ...	SS NL 76	SS L 76	76	54	185	119.1	160	58.5	36.5	34.7	19	179.7	4.56	14.3	32 x 13.5	

### Notes:

- Maximum loads quoted assume lubrication at the interface of [Bearings](#) and [Slide](#). This can best be achieved by using [Cap Seals](#), [Lubricators](#) or the Bleed Lubrication facility [↓](#). It is strongly recommended that load and life are determined using the methods shown in the [Load/Life Calculations](#) section. The bearing static and dynamic load capacities (C & Co) often quoted by manufacturers are not the best basis for practical life calculations. C & Co figures are included on the Bearing pages for comparison.
- Controlled Height (CHK) [Bearings](#) are usually selected from stock, quantities available may therefore be restricted. Please see the SL2 Technical Guide [↓](#).
- [Cap Seals](#) are not available on Short Carriages and all AUSSMS12... Carriages. [Lubricators](#) may be used for lubrication purposes.
- The datum mark identifies the reference edge used in manufacture. The concentric [Bearings](#) are always mounted on this side.
- [Bearing](#), [Cap Seal](#) and [Lubricator](#) fixing hole sizes and positions are detailed in the SL2 Technical Guide [↓](#). 'E' is the optimized drilling dimension and is suitable for general purposes. Actual Bearing positions will vary slightly when eccentrically adjusted.
- Double Row (DR) [Bearings](#) are not available on AUSSMS12... Carriages.





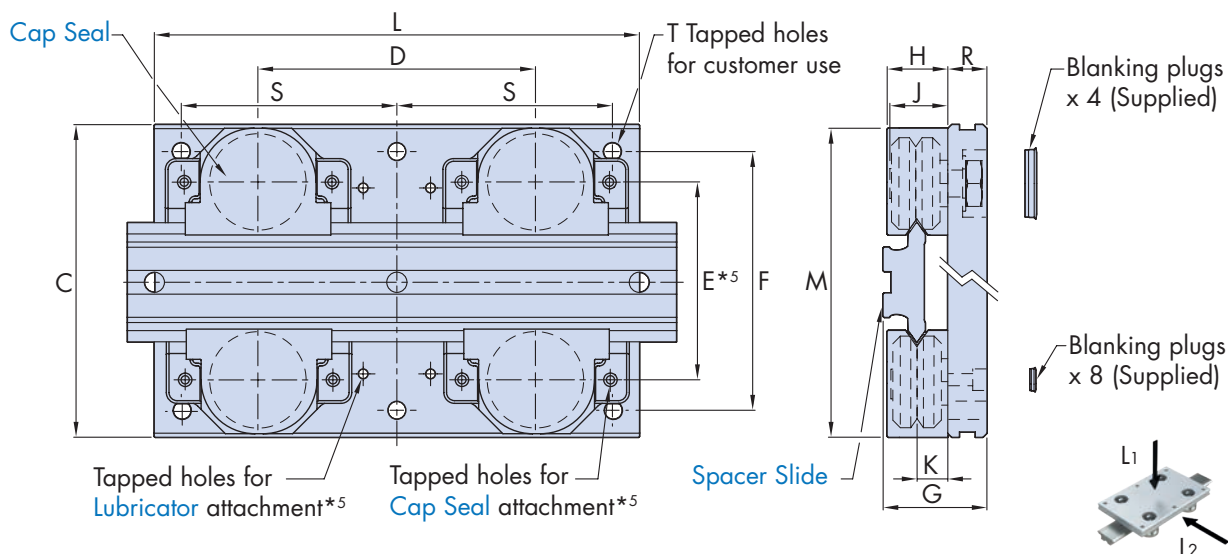
**The Controlled Height Bearing option (CHK)** minimizes variation between Bearings in respect of the important 'K' dimension. This is desirable in high precision applications\*2.

**The Cap Seal option (CS)** ensures efficient lubrication of the 'V' contact surfaces and protects against ingress of debris. Operational safety and system appearance are also improved. Once charged with grease, no further lubrication is necessary under most operating conditions. Lubrication vastly increases load capacity and life.

**The Lubricator option (LB)** applies oil to the 'V' contact surfaces by means of lightly sprung felt pads which are charged with oil to give long intervals between re-lubrication. The Lubricator option is useful where the advantages of increased load and life are required, but with lower friction compared to the Cap Seal.

See Application Examples on 8 - 12

### Example: Medium Length Carriage with Cap Seals on a Spacer Slide



	R	Short Carriage*3				Medium Carriage				Long Carriage				Max Load Capacity (N)*1			
		L	D	S	T	L	D	S	T	L	D	S	T	DR L1	DR L2	Twin L1	Twin L2
	7.34	50	35	18	4 x M4	75	60	25	4 x M4	100	85	50	4 x M4	-		240	240
	10	65	43	20	4 x M5	100	55	44	6 x M5	140	95	62	6 x M5	760	1200	500	400
	11.5	80	51	25	4 x M6	130	72	55	6 x M6	180	120	80	6 x M6	1600	3000	960	960
	12.5	100	70	40		150	90	65		200	140	90					
	14	110	80	50	4 x M8	160	100	70	6 x M8	220	160	100	6 x M8	3600	6000	3000	3000
	14.5	125	88	50		175	103	77.5		225	153	102.5					
	17	150	110	60		200	125	90		280	205	130					
	18	170	130	80	4 x M10	240	165	110	6 x M10	340	265	160	6 x M10	8000	10000	6000	6000
	20	200	140	90		300	198	135		400	298	185					

## Ordering Details

2 x AUSSM44 225 (CS) (DR) NS (CH) + Slide Part Number

Number of Carriages  
set to specified Slide

**AUSS...** = Assembled Unit

**SSCP...** = Carriage Plate only

Carriage Length = 225mm

Lubrication Options

**CS** = Cap Seals\*3

or **LB** = Lubricators

Leave blank if not required

Leave blank if Slide is not  
required and Carriage will  
be supplied in a loose  
condition for self-adjustment

**CH** = Controlled Height Bearings\*2  
Leave blank for standard tolerance

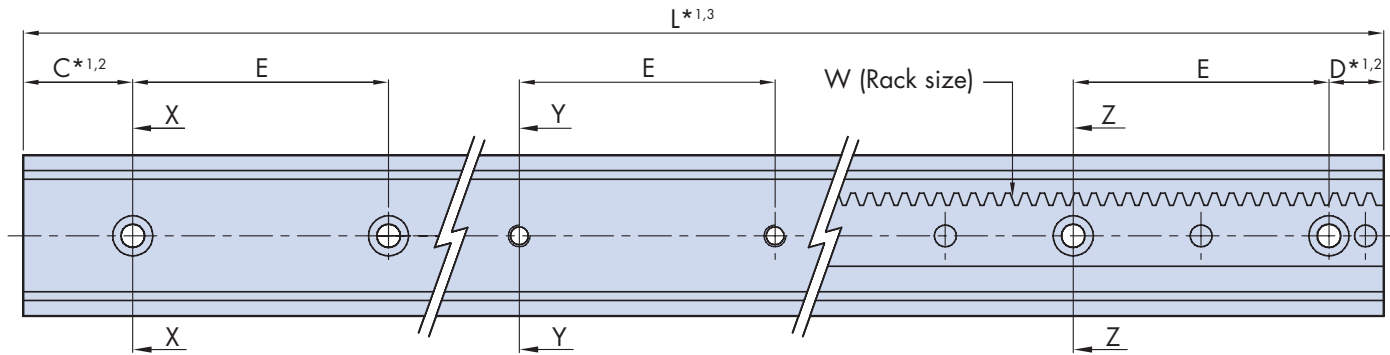
**NS** = Nitrile Seal

**DR** = Double Row Bearings\*6  
Leave blank for Twin Bearings

HepcoMotion Stainless Steel Double Edge Spacer Slides are hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customizing and all important surfaces are precision ground to a high degree of parallelism and surface finish to ensure good corrosion resistance.

Slide fixing holes are accurately positioned, enabling customers to pre-drill their mounting holes. Slides without holes are also available.

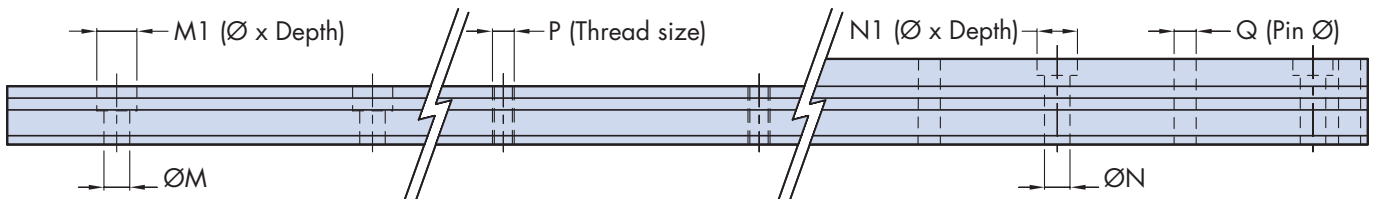
Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for [Bearings](#) and [Lubrication Devices](#). A central keyway is provided for simple location by means of Hepco Dowel Pins or customer's own key. Alternatively, where Lubrication Devices are not used, the datum edges may be located against a machined register\*<sup>5</sup>.



Slide with Counterbored Holes

Slide with Tapped Holes

Slide with Fitted [Rack](#)



Part Number	Use With* <sup>4</sup>		A ~ Width	B ±0.013	C & D* <sup>1,2</sup>		E	F	G	H	H1	J	K	L Max* <sup>1,3</sup>	
					Slide only	With Rack									
SS NMS 12 ...	... J 13 ...		12	12.37	20.5	-	45	2.85	6.2	4	1.8	8.5	1.7	1976	
SS NV 20 ...	... J 18 ...		20	20.37	43	15	90	4.21	8	5	2	12	1.75	4046	
SS NS 25 ...	... J 25 ...		25	25.74	43	15	90	4.71	10	6	2.5	15	2.6	4046	
SS NM 44 ...	... J 34 ...		44	44.74	43	15	90	6.21	12.5	8	3	26	2.3	4046	
SS NL 76 ...	... J 54 ...		76	76.74	88	30	180	9.21	19.5	15	5	50	4.8	4046	

## Notes:

- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified that maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal. The positions of the teeth on the [Rack](#) mounted versions relative to the mounting holes or Slide ends will vary. Rack mounted Slides with a regulated tooth position can be supplied on request.
- The C and D dimensions for [Rack](#) mounted Slides are less than that for plain versions to provide support for the Rack close to its end. Slide lengths which require C and D dimensions which differ from this may require an extra hole at a non-standard pitch.
- Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
- In the table, the preferred choices of [Bearings](#) to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the SL2 Technical Guide [↓](#)).
- Slides in their free unmounted state are not necessarily absolutely straight. If straightness is important, the Slide may be set by bolting down against a register or by utilizing the central keyway. If Hepco Dowel Pins are used, these should be positioned one each end centrally between the Slide end and first hole and one located centrally between each pair of fixing holes, or as deemed necessary for the application.
- Stainless steel low head cap screws DIN 6912 are not universally stocked, so Bishop-Wisecarver offers them as a convenience to customers in a single length for each thread size (see table). Plain Double Edged Spacer Slides are secured with cap screws to ISO 4762 / DIN 912, which are widely stocked.



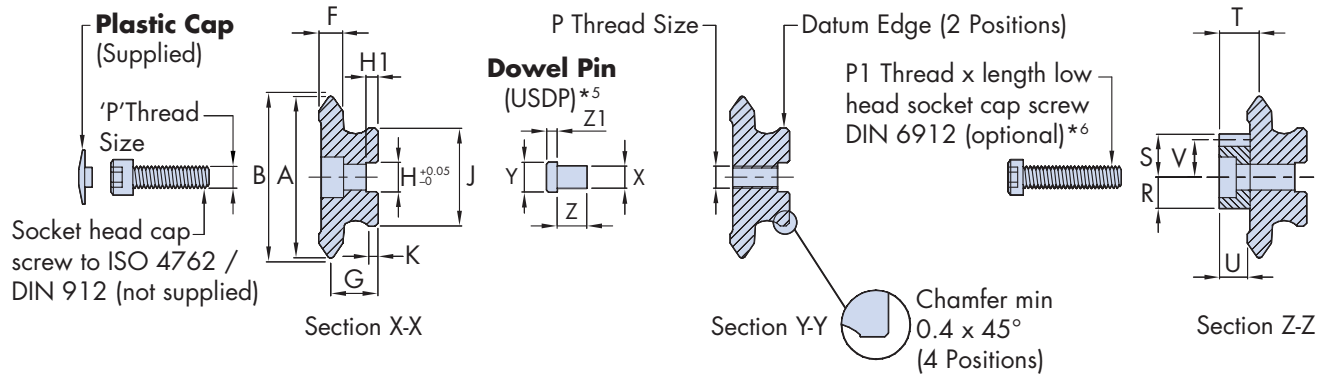


The rigidity of the Spacer Slide enables it to be used as a self supporting element or construction member in a machine. See the SL2 Technical Guide [↓](#) for Slide deflection calculations.

All Double Edge Spacer Slides, with the exception of the smallest, are available with a precision machined stainless steel Rack for driving purposes in conjunction with HepcoMotion stainless steel [Pinions](#)\*<sup>4</sup>.

[Racks](#) are dowelled to the Slide and become a fully serviceable element when bolted to the mounting surface. Racks may comprise of a number of lengths, precision mounted to a single Slide.

## See Application Examples on [8 - 12](#)



	M	M1	N	N1	P	P1* <sup>6</sup>		Q	R	S	T	U	V	W	Dowel Pin	X	Y	Z	Z1
						Screw	Part No.							Mod		K6	m6		
	3.5	6.2 x 3.1	-	-	M3	-	-	-	-	-	-	-	-	-	USD P4	4	4	6.75	-
	4.5	8 x 4.1	4.5	7.5 x 2.9	M4	M4 x 20	SSFS420	4	6.35	6.35	6.2	4	5.65	0.7	USD P5	4	5	6	1.75
	5.5	10 x 5.1	5.5	9.6 x 4	M5	M5 x 25	SSFS525	5	7.8	7.85	8.5	6	6.85	1	USD P6	4	6	6	2.25
	7	11 x 6.2	6.5	11 x 4.5	M6	M6 x 30	SSFS630	6	8.3	11.7	10.8	7.5	10.2	1.5	USD P8	6	8	8	2.75
	14	20 x 12	14	20 x 8.0	M12	M12 x 50	SSFS1250	8	13.2	18.6	18	13.3	16.6	2	USD P15	10	15	15	4.75

## Ordering Details

### SSNS25 L1290 (R) (T) (C15) (D15)

Part Number \_\_\_\_\_ Bespoke values of **C** & **D** dimensions  
Slide Length **L** = **1290** mm \_\_\_\_\_ Leave blank if standard\*<sup>1,2</sup>  
**R** - Rack mounted on Slide (Not available on SSNMS12) \_\_\_\_\_  
Leave blank if not required \_\_\_\_\_  
Fixing hole style: **T** - Tapped fixing holes, **N** - No holes  
Leave blank for counterbored holes  
(Options **T** and **N** are only available with Rack option to special order)

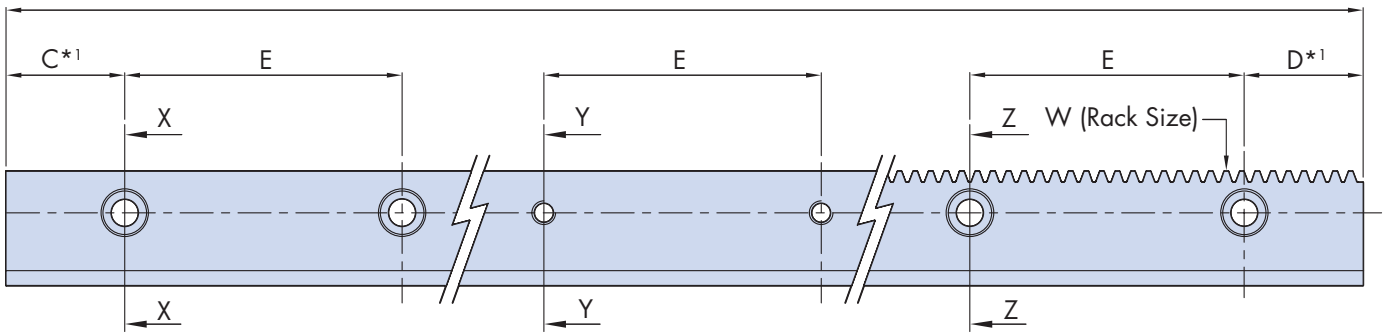
### Ordering Example:

1 x SSNM44 L536 \_\_\_\_\_ Stainless Steel Double Edge Spacer Slide x 536 mm long  
7 x USD P8 \_\_\_\_\_ 8 mm Ø dowel pins (optional)  
6 x SSFS630 \_\_\_\_\_ Low head socket cap screws M6 thread x 30 mm long (optional)

HepcoMotion Stainless Steel Single Edge Spacer Slides are hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customizing and all important surfaces are precision ground to a high degree of parallelism and surface finish to ensure good corrosion resistance.

Slide fixing holes are accurately positioned, enabling customers to pre-drill their mounting holes.

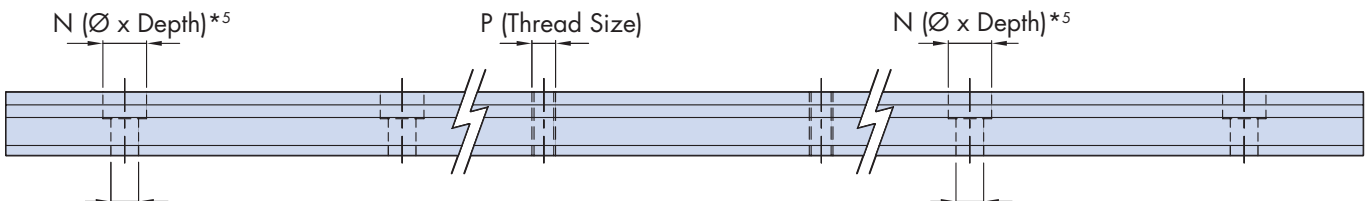
Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for [Bearings](#) and [Lubrication Devices](#). For precise positioning it is recommended that customers machine a register in their mounting face for locating against the back face of the slide<sup>\*4</sup>.




Slide with Counterbored Holes

Slide with Tapped Holes

Rack Cut Slide



Part Number	Use With <sup>*3</sup>											
		A ~ Slide Width	B ±0.013	B1	C & D*1	E	F	G	J	K		
SS NV E ...	... J 18 ...	16	16.19	6.5	43	90	4.21	8	12	1.75		
SS NS E ...	... J 25 ...	21	21.37	8.5	43	90	4.71	10	16	2.6		
SS NM E ...	... J 34 ...	29	29.37	10.5	43	90	6.21	12.5	20	2.3		
SS NL E ...	... J 54 ...	43	43.37	16	88	180	9.21	19.5	30	4.8		

## Notes:

- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above ( $n \times \text{hole pitch } E + C + D$ , where  $n$  equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal. The position of the teeth on the rack cut versions relative to the mounting holes or Slide ends, will vary. Rack cut Slides with a regulated tooth position can be supplied on request.
- Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting. Some sizes of Rack cut Slides are not always stocked in maximum lengths. In such cases the customer will be offered matched lengths for butting.
- In the table, the preferred choices of [Bearings](#) to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the SL2 Technical Guide [↓](#)).
- Slides in their free unmounted state are not necessarily absolutely straight. If straightness is important, the back face of the Slide may be set by bolting down against a register.
- For the rack cut version of Slide size NVE, the counterbore diameter 'N' has been reduced slightly to suit cap head screws ISO 4762 / DIN 912 without knurled head. This is to maximize the strength in the critical area between the counterbore and root of the rack teeth. Due to accuracy requirements, pre-drilling of fixing holes is not recommended. Stainless steel screws are available from Bishop-Wisecarver: Part No. SSF5420 (M4 x 20 long).

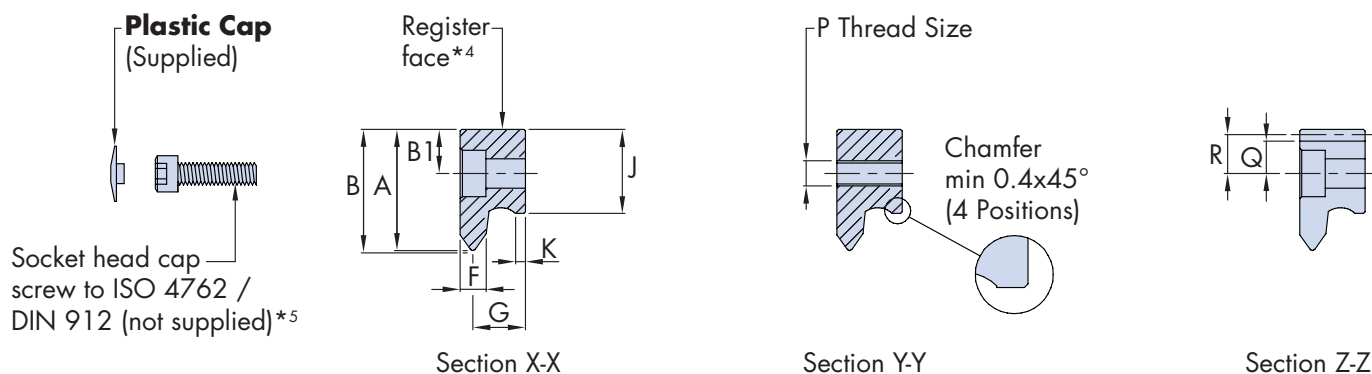


The Single Edge format allows two Slide 'V's to be mounted wide apart resulting in a considerable increase in moment load capacity, stiffness and stability. Spacing Slides apart also provides room for a centrally mounted drive.

Single Edge Spacer Slides are available with a precision rack machined into the back face, providing a convenient and strong means of driving. Corresponding [Pinions](#) are available.

The large rear face of the Single Edge Spacer Slide, although unhardened, is sufficiently durable to act as a track on which to run Hepco [Track Rollers](#).

See Application Examples on [9 - 11](#)



	<b>L max<sup>*1,2</sup></b>	<b>M</b>	<b>N<sup>*5</sup></b>	<b>P</b>	<b>Q</b>	<b>R</b>	<b>W<sub>Mod</sub></b>	<b>Max Rack Force lubricated (N)</b>
	4046	4.5	8 x 4.1	M4	4.82	5.8	0.7	300
	4046	5.5	10 x 5.1	M5	6.15	7.4	1	500
	4046	7	11 x 6.2	M6	7.69	9.25	1.25	1000
	4046	11	18 x 10	M10	11.6	14.1	2	1600

## Ordering Details

Part Number SSNME L930 (R) (T) (C15) (D15)

Slide Length **L = 930** mm

**R** = Rack cut Slide (Leave blank if not required)

Bespoke values of **C** & **D** dimensions  
Leave blank if standard<sup>\*1</sup>

Fixing hole style:  
**T** = Tapped fixing holes  
Leave blank for counterbored holes

### Ordering Example:

1 x SSNSE L2066 N Single Edge Spacer Slide 2066 mm long with no holes

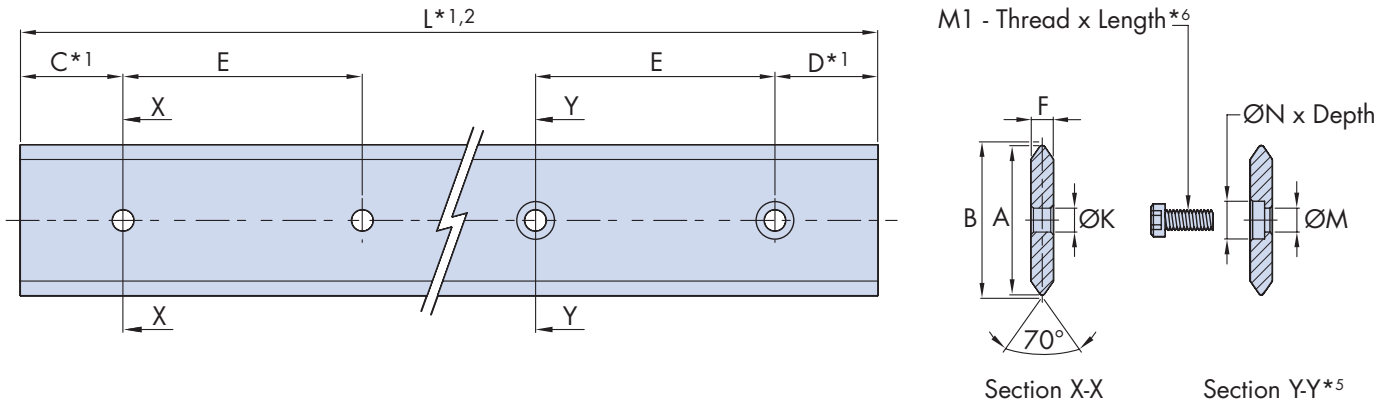


HepcoMotion Stainless Steel Flat Slides are zone hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customizing and all surfaces are precision ground to a high degree of parallelism and surface finish to ensure good corrosion resistance.

Slide fixing holes are accurately positioned enabling customers to pre-drill their mounting holes.

Flat Slides are useful if weight saving or minimum inertia is required, where the Slide is the moving component. Also where it is practical and cost advantageous to design a support profile integral with the machine, to provide running clearance for the [Bearings](#) and [Lubrication Devices](#).

See Application Examples on [9](#)



Part Number	Use With <sup>*3</sup>	A	B	C & D <sup>*1</sup>	E	F	K		L max <sup>*1,2</sup>	M	M1 <sup>*6</sup>		N
		~Slide Width	±0.013		±0.2		Ø	Screw			Screw Size	Part No	Ø x Depth
SS MS 12 ...	... J 13 ...	12	12.55	13	30	2.98	3.5	M3	1000	-	-	-	-
SS V 20 ...	... J 18 ...	20	20.37	43	90	4.27	4.5	M4	4046	4.5	M4x10	SSFS410	8 x 2.8
SS S 25 ...	... J 25 ...	25	25.81	43	90	4.72	7	M6	4046	5.5	M5x10	SSFS510	10 x 3.5
SS S 35 ...		35	35.81			4.72							
SS S 50 ...		50	50.82			4.67							
SS M 44 ...	... J 34 ...	44	44.81	43	90	6.16	9	M8	4046	7	M6x12	SSFS612	11 x 4
SS M 60 ...		60	60.81			6.11							
SS M 76 ...		76	76.81			6.11							
SS L 76 ...	... J 54 ...	76	76.81	43	90	9.12	11.5	M10	4046	11.5	M10x20	SSFS1020	18 x 6

## Ordering Details

Part Number SSM60 L930 (C) (C15) (D15) Bespoke values of **C** & **D** dimensions in mm. Leave blank if standard<sup>\*1</sup>)

Slide Length **L = 930** mm

**C** - Counterbored holes (not available on SSMS12) Leave blank for plain holes

### Ordering Example:

1 x SSL76 L2156 C Flat Slide x 2156 mm long with counterbored holes

### Notes:

- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal.
- Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
- In the table, the preferred choices of [Bearings](#) to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the SL2 Technical Guide [↓](#)).
- Slides in their free unmounted state are not necessarily absolutely straight. If important, the Slide should be bolted down to a flat surface and set straight.
- A flush top surface is necessary where a belt is to be run on the top surface of the Slide, or in cases where there is restricted room between Slide and [Carriage](#) plate as may happen if mixing and matching between Slide and [Bearing](#) sizes.
- Stainless steel low head socket cap screws DIN 6912 are not universally stocked but are available from Bishop-Wisecarver in a single length for each thread size (see table).

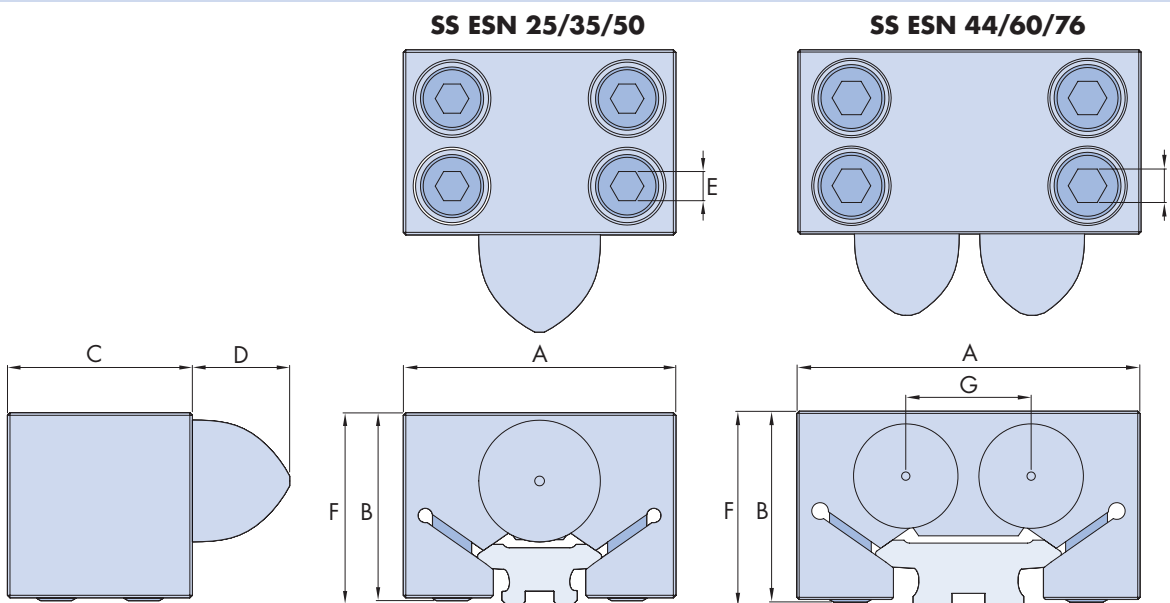


HepcoMotion End Stops provide a physical stop to the linear movement and impact protection should a system overrun.

The conical buffer provides a controlled deceleration to the [Carriage](#) to protect the system and payload. Rigorously tested, HepcoMotion End Stops are light in weight and have a high degree of corrosion resistance.

End Stops are suitable for SL2 [Spacer](#) and [Flat Slides](#) from 25 to 76mm wide, and can be positioned anywhere along the length of a Slide, for maximum flexibility.

See Application Examples on [12](#)



Part Number	Use With		A	B	C	D	E	F	G
SS ESN S25	SS NS 25	SS S 25	56	38.6	38	19	6	39.5	-
SS ESN S35	-	SS S 35	69	38.6	38	19	6	39.5	-
SS ESN S50	-	SS S 50	84	38.6	38	19	6	39.5	-
SS ESN M44	SS NM 44	SS M 44	82	45.6	44	19	8	46.5	30
SS ESN M60	-	SS M 60	100	45.6	44	19	8	46.5	44
SS ESN M76	-	SS M 76	118	50.6	44	19	8	51.5	50
SS ESN L76	SS NL 76	SS L 76	122	67.6	48	40	10	68.5	50

Part Number	Clamping Screw Torque (Nm)	Maximum Static Force (N)* <sup>1</sup>	Maximum Impact Energy (J)* <sup>2</sup>
SS ESN S25	23	1000	6
SS ESN S35	23	1000	6
SS ESN S50	23	1000	6
SS ESN M44	47	2000	12

Part Number	Clamping Screw Torque (Nm)	Maximum Static Force (N)* <sup>1</sup>	Maximum Impact Energy (J)* <sup>2</sup>
SS ESN M60	47	2000	12
SS ESN M76	47	2000	12
SS ESN L76	80	5000	18

## Ordering Details

### SS ESN M44



Part Number \_\_\_\_\_ **M44** = To suit Slide size


#### Notes:

1. Indicates maximum force that can be applied to the SL2 End Stop under gradual application.
2. Indicates maximum energy that can be absorbed by the SL2 End Stop under sudden impact conditions.
3. SL2 End Stops are intended for infrequent impacts. For repeated impacts, please contact Bishop-Wisecarver's technical sales team to discuss your requirement.
4. To fit End Stop sizes SSESNS25, SSESNS35 and SSESNS50 to non-counterbored SL2 [Flat Slides](#), the End Stops must be fitted before the fixing screws for mounting the Flat Slide.

HepcoMotion Stainless Steel Bearings are designed to be used with particular sizes of [Slide](#) but may be "Mix & Matched" in many instances\*5.

The following Bearing formats and fixing methods are available:

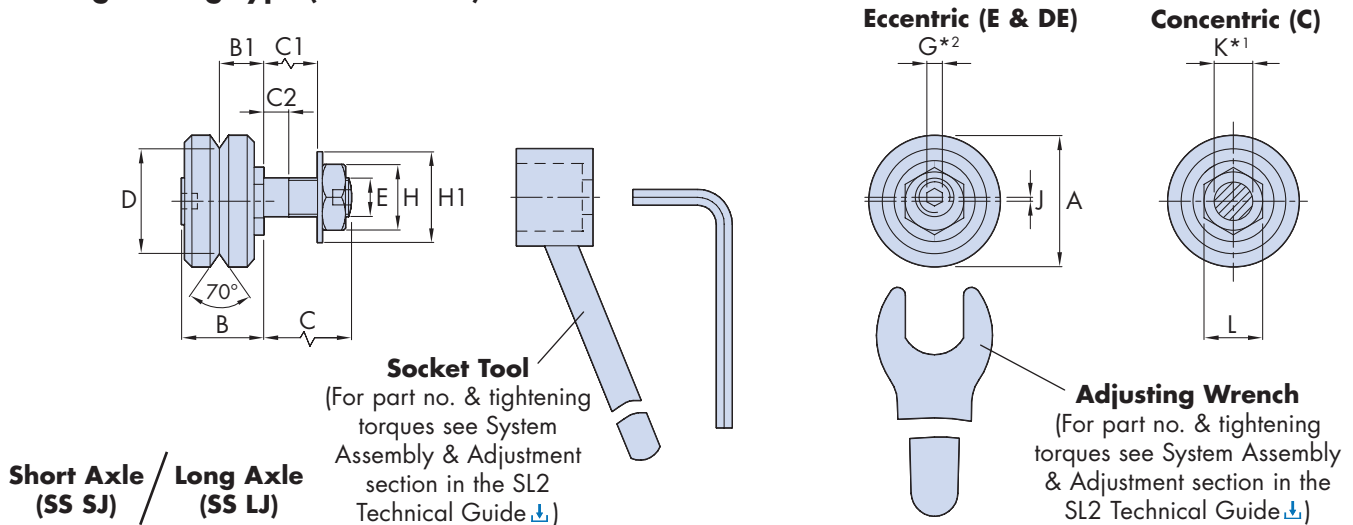
**The Twin Bearing type**,  which is the default choice, comprises of two individual deep groove ball bearings on a single axle. This construction  offers some compliance, allowing smoother running, easy adjustment and greater tolerance of misalignment.

**The Double Row Bearing type (DR)**  incorporates a one-piece bearing with two ball tracks. This offers higher load capacity, especially in the radial direction and is less susceptible to entrapment of debris\*7.

Both types of Bearing have been designed specially for [Slide](#) System applications and their performance confirmed by rigorous testing. External dimensions are identical.

All Stainless Steel Bearings are supplied with Nitrile Seals, these provide a high degree of protection against ingress of water or debris.

## Through Fixing Type (SS SJ/SS LJ)



Part Number	Use With*6	A	B	B1	C		C1 max		C2		D ±0.025	E Metric Fine	F	G*2	H
					Short Axle	Long Axle	Short Axle	Long Axle	Short Axle	Long Axle					
SS ... J 13 ...	SSNMS & SSMS	12.7	10.1	5.47	5.8	9.5	3	6.7	2.2	2.4	9.51	M4x0.5	8	-	7
SS ... J 18 ...	SSNV & SSV	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	14.0	M6x0.75	10	2.5	10
SS ... J 25 ...	SSNS & SSS	25	16.6	9	9.8	19	3.8	13	3.4	4.9	20.27	M8x1	14	3	13
SS ... J 34 ...	SSNM & SSM	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	27.13	M10x1.25	18	4	17
SS ... J 54 ...	SSNL & SSL	54	34.7	19	17.8	30	8.2	20.4	5.7	7.9	41.76	M14x1.5	28	6	22

Part Number	Max Working Load Capacity (N)				Bearing Static (Co) and Dynamic (C) Load Capacity (N)*4							
	Double Row Bearings		Twin Bearings		For Double Row Bearings				For each Twin Bearing race			
	Radial	Axial	Radial	Axial	Radial Loads		Axial Loads		Radial Loads		Axial Loads	
					Co	C	Co	C	Co	C	Co	C
SS ... J 13 ...	-	-	120	60	-	-	-	-	265	695	74	194
SS ... J 18 ...	600	190	200	125	1168	2301	435	857	593	1438	173	419
SS ... J 25 ...	1500	400	480	240	2646	5214	821	1618	1333	3237	326	791
SS ... J 34 ...	3000	900	1500	750	5018	9293	1362	2523	2600	5291	557	1270
SS ... J 54 ...	5000	2000	3000	1500	12899	21373	2777	4601	6657	13595	1136	2320

### Notes:

- It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
- All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment as shown, with the exception of size 13.
- Controlled Height (CHK) Bearings are usually selected from stock, quantities available may therefore be restricted. Please see the SL2 Technical Guide [Link](#).
- The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the [Load/life Calculations](#) section to determine system performance.
- The preferred choices of [Slide](#) to use with each Bearing are quoted. Other Slides may be used, as shown in the 'Mix & Match' Component Compatibility section of the SL2 Technical Guide [Link](#).
- The Blind Hole Eccentric Bearings cannot be fitted with [Cap Seals](#), however [Slide Lubricators](#) may be specified instead.
- Double Row (DR) size 13 Bearings are not available.



The **Through Hole Fixing type** is available in two axle lengths, with the short axle version being compatible with [Standard Carriage Plates](#). Both versions are available as fixed position **Concentric type (C)**, adjustable **Eccentric type (E)**, and **Double Eccentric type (DE)**, which allows a Removable Carriage [↓](#) to be disengaged from a [Slide](#).

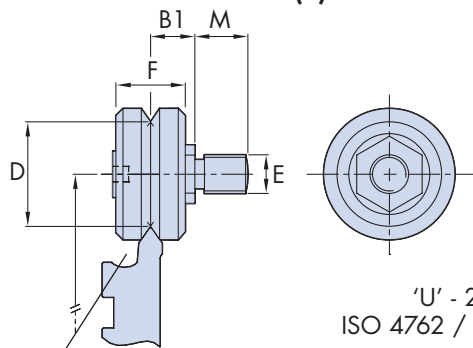
All Bearings are available in a **Controlled Height version (CHK)** which minimizes variation in the B1 dimension\*<sup>3</sup>. This is desirable in high precision applications.

The **Blind Hole Fixing type (BH)** allows mounting into a solid machine base where through mounting is not possible, or where adjustment from the front is preferred. They are available in **Concentric type (C)**, which are fixed, and **Eccentric type (E)**, which are adjustable.

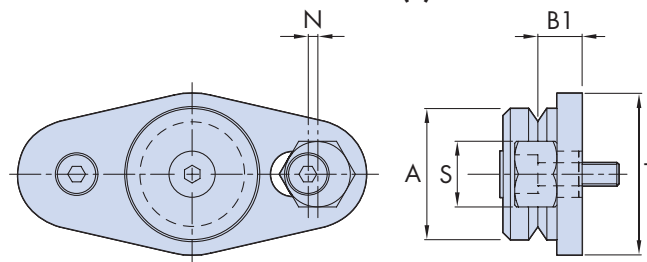
All Bearings are greased for life internally. Customers are strongly recommended to provide lubrication to the interface between Bearings and [Slide](#) by specifying Hepco [Cap Seals](#)\*<sup>6</sup>, which fit over the Bearings, or by using Hepco [Lubricators](#) with or without Bleed Lubrication. Lubrication greatly increases load capacity and life.

**See Application Examples on [8 - 12](#)**

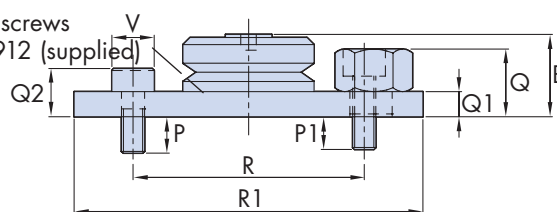
### Blind Hole Fixing Type (SS BHJ) Concentric (C)



### Eccentric (E)



'U' - 2 cap screws  
ISO 4762 / DIN 912 (supplied)

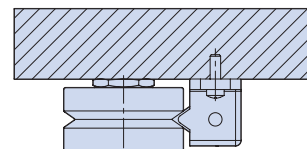


Drilling centers for all combinations of [Slide](#) and Bearing are given in the SL2 Technical Guide [↓](#).

	H1	J		K*1	L	M	N	P	P1	Q	Q1	Q2	R	R1	S	T	U	V
		...E...	...DE...	+0.00 -0.03									±0.1					
	9	0.5	1.9	4	7	5.8	1.0	6.25	6.6	8.5	3.75	6.75	30	47.5	8	20	M3	5.5
	13	0.7	2.6	6	11	7.4	1.2	8	10.5	10	4	8	38	54	11	24.5	M4	7
	17	0.75	2.75	8	13	9.8	1.5	7	9	12	5	10	50	72	14	32	M5	8.5
	21	1	3.6	10	15	13.8	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	17	42	M6	10
	28	1.5	5.5	14	27	17.8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	25	62	M8	13



A range of  
**Bearing Lubricators**  
are available as an alternative to  
[Cap Seals](#) and [Slide Lubricators](#).  
Please refer to the SL2 Technical  
Guide for more information.



## Ordering Details

Stainless Steel [SS](#)  
Fixing type. Choose from:  
**SJ** = Short Axle, **LJ** = Long Axle  
& **BHJ** = Blind Hole Fixing  
Part Number (~ Bearing Diameter in mm) [25](#)  
**C** = Concentric (fixed), **E** = Eccentric (adjustable)  
or **DE** = Double Eccentric (for disengagement purposes)  
**(DR)**  
**NS** = Nitrile Seal (Standard)  
**(CHK)** = Controlled Height\*<sup>3</sup>  
Leave blank if not required  
**Double Row Bearing**\*<sup>7</sup>  
Leave blank if **Twin Bearing** is required



HepcoMotion flexible plastic Cap Seals fit over Stainless Steel [Bearings](#), providing effective sealing and protection, as well as wiping of debris from the [Slide](#) profile. Lubrication of the 'V' surface is provided by means of oil impregnated felt wipers.

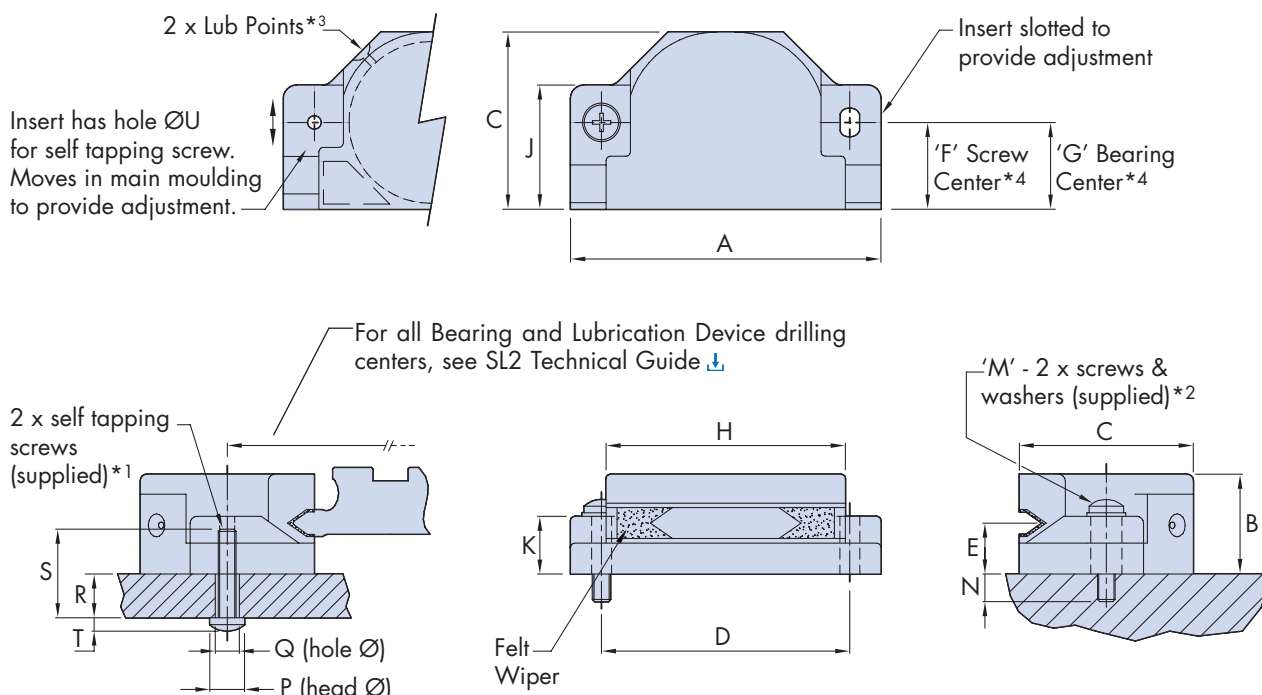
The internal cavity is filled with grease via the lubrication points, further improving lubrication and recharging the felt wipers as the grease releases oil under operation. Most systems require no further lubrication during the lifetime of the machine\*<sup>3</sup>. The fitting of these seals increases life and load capacity, and linear speed capability, as well as improving operator safety.

Cap Seals are not available for use with Blind Hole Eccentric type [Bearings](#) and J13 Bearings.


**See Application Examples on [8 - 12](#)**



Both types of insert supplied.



For all Bearing and Lubrication Device drilling centers, see SL2 Technical Guide [↓](#)

Part Number	Use With																			
		A	B	C	D	E	F	G	H	J	K	M*2		N	P	Q	R	S	T	U
						±0.1							Screw	Length				max		
SS CS 18 *4	... J 18 ...	42	13.8	21.2	32.5	6.75	12.3	10.4	32.3	18	6	M2.5	12	5.5	4.5	3	8.5	12	2	2
SS CS 25	... J 25 ...	55	18	30	44	9	14.8	14.8	43	22	8.6	M3	12	2.9	5.5	3.5	11	16	2	2.8
SS CS 34	... J 34 ...	70	22.5	40	56	11.5	19.6	19.6	54	28	13	M4	20	6.2	7	4.5	14	20	2.7	3.6
SS CS 54	... J 54 ...	98	36.5	60	80	19	29.7	29.7	78	40	20	M5	25	4	9	6	24	35	3.5	4.7

Part Number	Suitable for Slide Sections				
	MS	V	S	M	L
SS CS 18 *4	x	✓	✓	✓	✓
SS CS 25	x	x	✓	✓	✓
SS CS 34	x	x	x	✓	✓
SS CS 54	x	x	x	x	✓

## Ordering Details

4 x **SS CS 34**

State quantity and part number \_\_\_\_\_

### Notes:

- Two self tapping screws for plastic are supplied with each Cap Seal. These have a cross-recessed pan head and use the PT thread form.
- Two stainless steel cross recessed cheese head screws DIN7985A and washers DIN125A are supplied with each cap seal.
- Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a No.2 consistency lithium soap based grease. A male grease connector Part No. CSCHF4034 or a complete gun is available from Bishop-Wisecarver if required.
- The fixing screw positions for the SSCS18 do not lie on the centerline of the nominal [Bearing](#) position, unlike all other sizes.





HepcoMotion plastic Slide Lubricators normally fit one each side of the [Slide](#), between pairs of [Bearings](#). However, any number may be fitted in any position according to requirements. Lubricators provide lubrication to the working surface of the Slide by means of spring loaded oil impregnated felt wipers.

System load capacity and life are greatly increased whilst retaining the low friction characteristics of dry running. Lubricators may be specified as part of any Hepco SL2 [Carriage](#) assembly or used within the customers' own design.

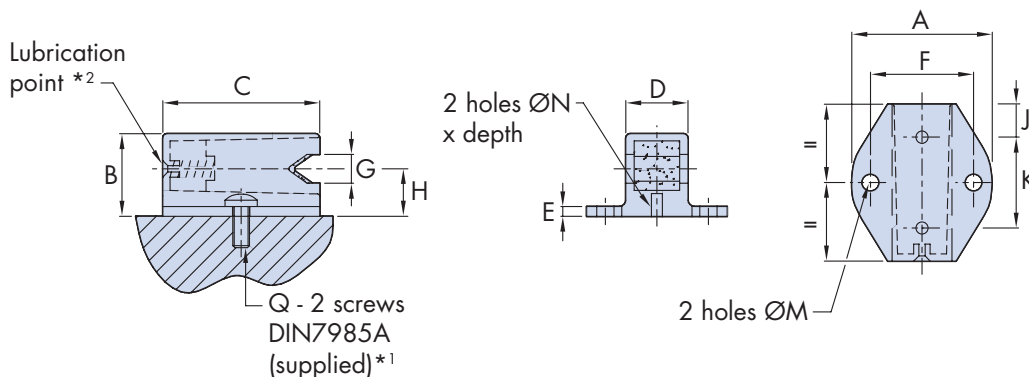
Lubricators are supplied with fasteners.

See Application Examples on [8 - 12](#)


## Slide Lubricators for [Standard Bearings](#)

For all Bearing and Lubrication Device drilling centers, see SL2 Technical Guide.

### Flanged type (...F)



Part Number	A	B	C	D	E	F ±0.1	G	H	J	K	M	N	Q*1 Thread x Length
SS LB 12 F *3	17	10	13	5.2	2	12	3.1	5.46	3	6.5	2.7	1.7x2.5	M2.5x6
SS LB 20 F *3	19	12	22.5	6.5	2	13	7.2	6.75	4.75	13	2.7	1.7x2.5	M2.5x6
SS LB 25 F	25	16.5	28	9.9	2	18	5.5	9	6	16	3.2	2.4x4.5	M3x8
SS LB 44 F	34	20	38	15	2.4	25	7	11.5	8	22	4.2	2.4x5.5	M4x10
SS LB 76 F	50	33.5	57	22.7	4.5	38	10	19	12	33	5.2	2.7x9	M5x12

Part Number	Use With 	Suitable for Slide Sections				
		MS	V	S	M	L
SS LB 12 F *3	...J 13...	✓	✓	✓	✓	✓
SS LB 20 F *3	...J 18...	x	✓	✓	✓	✓
SS LB 25 F	...J 25...	x	✓	✓	x	x
SS LB 44 F	...J 34...	x	x	x	✓	x
SS LB 76 F	...J 54...	x	x	x	x	✓

## Ordering Details

Part number SSLB44 F  
 Lubricator type:  
**F** = Flanged



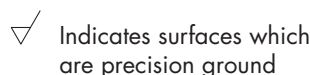
**Bearing Lubricators** [↓](#) and **Bleed Lubrication** [↓](#) are available as alternatives to [Cap Seals](#) and [Slide Lubricators](#). Please refer to the SL2 Technical Guide for more information.





### Notes:

- Two stainless steel cross-recessed cheese head screws size Q (DIN7985A) are supplied with each flanged type Lubricator.
- Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 cSt viscosity EP mineral oil.
- Sizes SSLB12 and SSLB20 have a true 'V' shape to enable them to engage with [Slide](#) thicknesses larger than their G dimensions.

It is recommended that running surfaces should be kept lightly oiled. HepcoMotion SL2 Flat Track and Roller Lubricators are available for this purpose. Please see the SL2 Technical Guide for more information.

 9

Part Number	Use With		A ±0.025	B ±0.025	C*1	D*1	E	F	G Ø	Screw Size	H*3 Ø	J*3 ~	L*1,2 max
													
SS FT 24 12	SS...R 18...	SS LRN 18...	12	24	20.5	20.5	45	7.5	6	M5	10	5	2021
SS FT 32 16	SS...R 25...	SS LRN 25...	16	32	43	43	90	8.75	7	M6	11	6	4046
SS FT 40 20	SS...R 34...	SS LRN 34...	20	40	43	43	90	12	9	M8	15	8	4046

**SS FT 4020 L1830 C15 D15**

Bespoke values of **C** & **D** dimensions  
Leave blank if standard (see table)

- Any length of Flat Track within max length stated can be supplied, but for optimum price and delivery time, track lengths should be specified which maintain the C and D dimensions in the table above. In all cases unless otherwise specified by the customer, C and D dimensions will be supplied equal
- Where Tracks longer than maximum length are required, two or more lengths can be matched, suitable for butting, on request. In these cases the mating ends will be ground square.
- The standard means of securing Flat Tracks to the mounting surface is via counterbored fixing holes in the positions shown. Other fixing hole possibilities are available on request. It is recommended that holes in the mounting surface are positioned by 'spotting through' from the Flat Track.
- Important.** Tracks in their free unmounted state are not necessarily absolutely straight, however, they may be set to the required degree of straightness during installation.

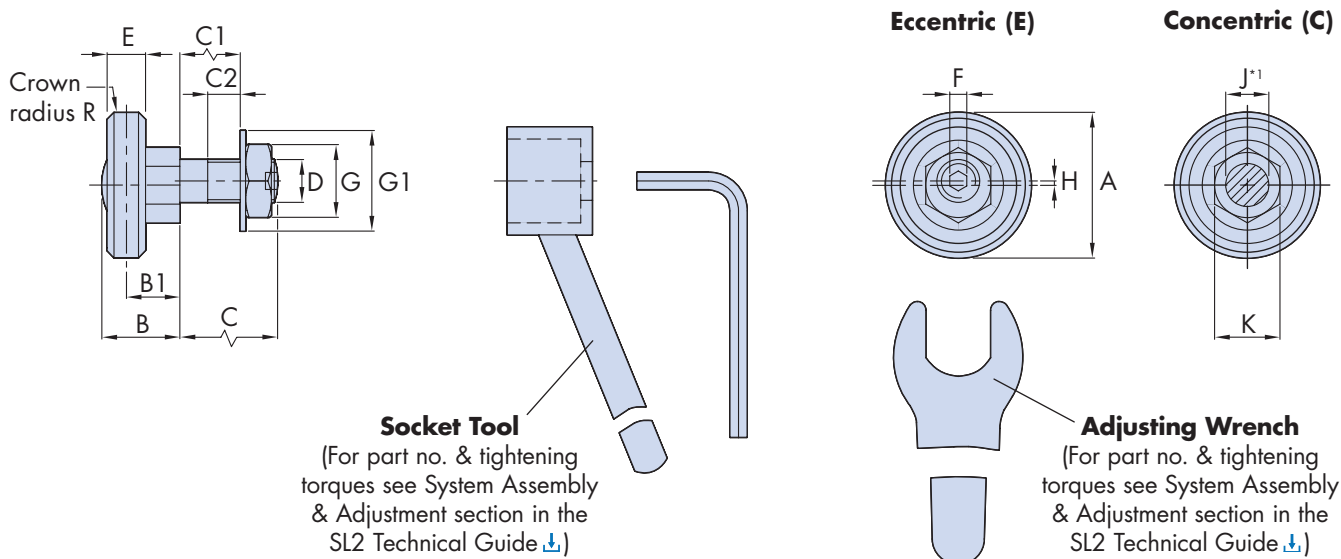


HepcoMotion Stainless Steel Narrow Track Rollers complement the other SL2 ranges of [Bearings](#). They are available in through hole fixing format in a single axle length in both **Concentric Type (C)**, which are fixed, and **Eccentric Type (E)**, which are adjustable. Narrow Track Rollers consist of a high capacity single row deep groove ball bearing with a thick wall crowned outer ring. They are fitted with nitrile seals providing protection against liquids at the expense of a small increase in friction. They are suitable for running on any flat surface and as a retaining roller on the rear face of the [Stainless Steel Single Edge Spacer Slide](#).

Rollers are greased for life internally, however, it is recommended to oil the running surface. HepcoMotion SL2 Flat Track Lubricators are available for this purpose. Please see the SL2 Technical Guide [↓](#) for more information.

Narrow vacuum & high temperature and low temperature Track Rollers are also available, having identical dimensions. See SL2 Technical Guide [↓](#).

## See Application Example on [9](#)



Part Number	Use With*3	A	B	B1	C	C1	C2	D Metric Fine	E	F	G	G1	H	J*1 +0.00 -0.03	K	R
SS LRN 18 ...	SS FT 24 12	18	11.5	8	14	10	2.5	M6x0.75	5	2.5	10	13	0.7	6	11	500
SS LRN 25 ...	SS FT 32 16	25	14.5	10	19	13	5	M8x1	7	3	13	17	0.75	8	13	500
SS LRN 34 ...	SS FT 40 20	34	18.2	12.5	22	14.8	6	M10x1.25	9	4	17	21	1	10	15	500

Part Number	Max Working Load Capacity (N)	Static (Co) and Dynamic (C) Load Capacity*2	
		Co (N)	C (N)
SS LRN 18 ...	400	593	1438
SS LRN 25 ...	1000	1333	3237
SS LRN 34 ...	2000	2600	5291

## Ordering Details

**SS** = Stainless Steel      **LRN** = Long Axle fixing type      **SS LRN 25 C NS**      **NS** = Nitrile Seal (Standard)  
**C** = Concentric (fixed) or **E** = Eccentric (adjustable)      Part Number (Roller Diameter in mm)

### Notes:

- It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
- The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations on [34-36](#) to determine system performance.
- Each size of Narrow Track Roller has been designated for use with a specific size of [Flat Track](#), as shown. However, any Track Roller may be used in conjunction with any size of Flat Track, [Single Edge Slide](#) or other running surface according to practicality of design.

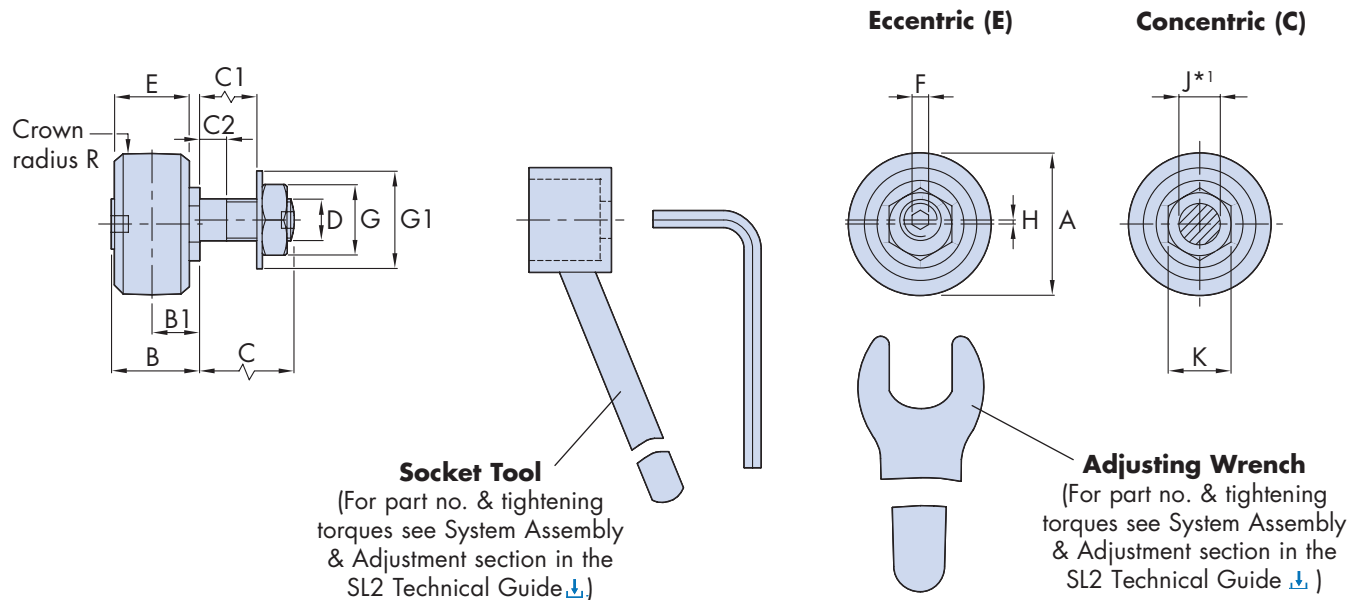
HepcoMotion Stainless Steel Wide Track Rollers can be used with Hepco [Flat Tracks](#), the back face of [Single Edge Spacer Slides](#) and on any other type of running surface. Rollers comprise of a high capacity twin row, deep groove ball bearing with a substantial section outer ring with crowned profile.

The **Through Hole Fixing type** is available in two axle lengths covering most thicknesses of mounting plate.

The **Blind Hole Fixing type** can be used where through holes are not possible, or where adjustment from the front is preferred.

Both versions are available in fixed position **Concentric type (C)** and adjustable **Eccentric type (E)**.

## Through Fixing Type (SS SR/SS LR)



**Short Axle / Long Axle**  
(SS SR) / (SS LR)

Part Number	Use With*3	A	B	B1	C		C1 max		C2		D Metric Fine	E	F	G	G1	
					Short Axle	Long Axle	Short Axle	Long Axle	Short Axle	Long Axle						
SS R 18 ...	SS FT 24 12 ...	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	M6 x 0.75	10	2.5	10	13	
SS R 25 ...	SS FT 32 16 ...	25	16.6	9	9.8	19	3.8	13	3.4	4.9	M8 x 1	14	3	13	17	
SS R 34 ...	SS FT 40 20 ...	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	M10 x 1.25	18	4	17	21	

Part Number	Max Working Load Capacity (N)	Roller Static (Co) and Dynamic (C) Load Capacity*2	
		Co (N)	C (N)
SS R 18 ...	600	1168	2301
SS R 25 ...	1600	2680	4970
SS R 34 ...	3200	5162	9560

### Notes:

1. It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
2. The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations on [34-36](#) to determine system performance.
3. The preferred choice of [Flat Track](#) for each size of Roller is listed. However, any Track Roller may be used with any size of Flat Track or [Single Edge Spacer Slide](#) according to practicality of design.



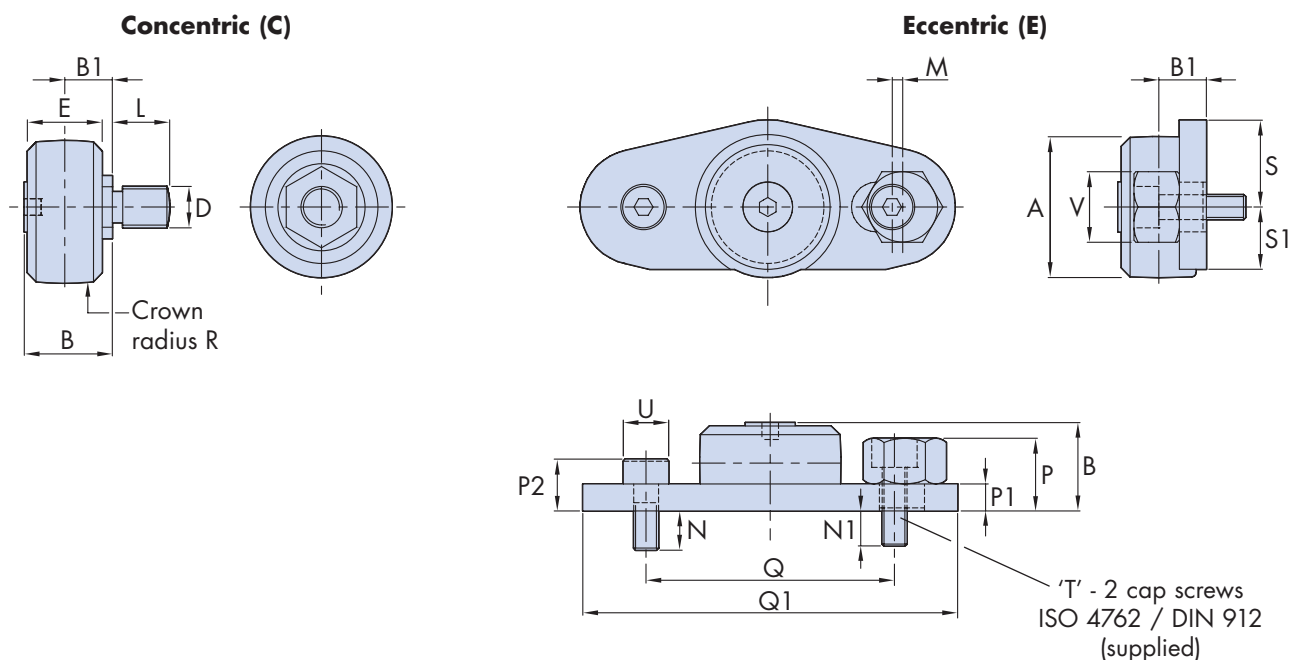
Rollers come with nitrile seals (NS), for a high degree of protection against ingress of water or debris.

Wide Track Rollers are available in the same basic sizes as Hepco SL2 'V' Bearings and are well matched for functionality and performance in systems comprising both types of Bearing.

Rollers are greased for life internally, however, it is recommended to oil the running surface. HepcoMotion SL2 Flat Track and Roller Lubricators are available for this purpose. See the SL2 Technical Guide .

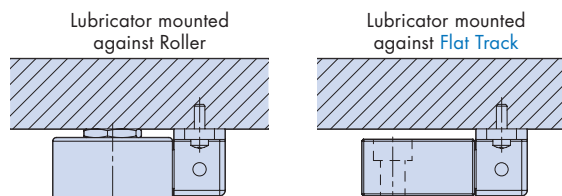
See Application Example on 9

## Blind Hole Fixing Type (SS BHR)



	H	J*1 +0.00 -0.03	K	L	M	N	N1	P	P1	P2	Q	Q1	R	S	S1	T	U	V
	0.7	6	11	7.4	1.2	8	10.5	10	4	8	38	54	500	12.3	7.8	M4	7	11
	0.75	8	13	9.8	1.5	7	9	12	5	10	50	72	1000	16	11	M5	8.5	14
	1	10	15	13.8	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	1000	21	15.3	M6	10	17

A range of **Flat Track and Roller Lubricators** are available. Please refer to the SL2 Technical Guide . for more information.



## Ordering Details

**SS** = Stainless Steel

Fixing type. Choose from:

**SR** = Short Axle, **LR** = Long Axle

& **BHR** = Blind Hole Fixing

**SS LR 25 C NS**

**NS** = Nitrile Seal (Standard)

**C** = Concentric (fixed) or **E** = Eccentric (adjustable)

Part Number (Roller Diameter in mm)



HepcoMotion Stainless Steel Racks provide a durable and powerful linear drive when used in conjunction with Hepco or other good quality, hardened [Pinions](#).

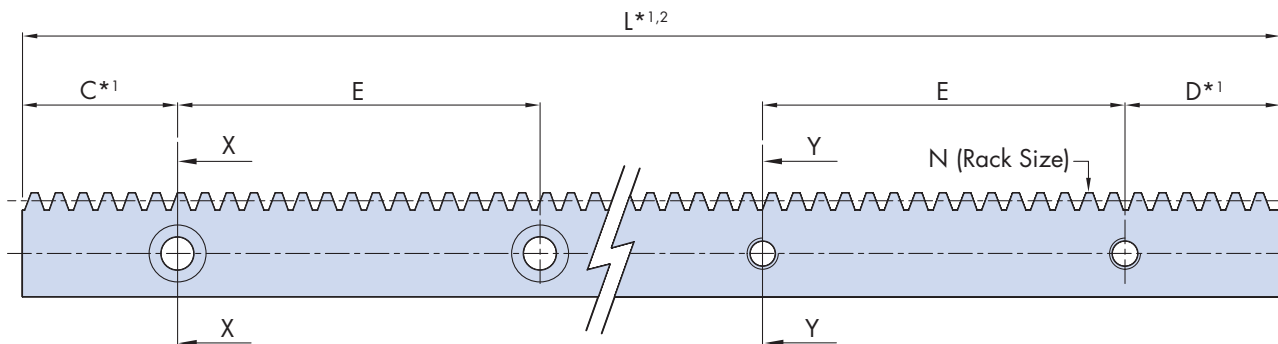
Racks are made from high quality stainless steel, ground on all faces prior to tooth cutting. Teeth are metric module with 20° pressure angle and are machined to a high degree of precision.

Racks are supplied with fixing hole types as shown or without holes if preferred. All holes are accurately positioned to enable customers to pre-drill their mounting holes.

The back face of the Rack is controlled parallel to the tooth pitch line, enabling it to be used as a register for setting\*4.

For best performance, the teeth should be lubricated with No.2 consistency lithium soap-based grease.

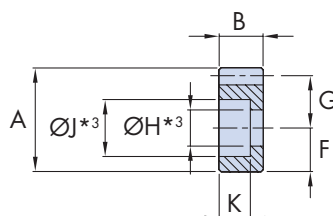
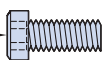
See Application Examples on [11 - 12](#)



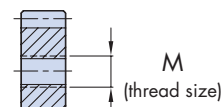
**Rack with Counterbored Holes**

**Rack with Tapped Holes**

M1 - Thread x Length  
Low head socket cap  
screw to DIN 6912\*3



Section X-X



Section Y-Y

Part Number	Use With	A	B	C*1	D*1	E	F	G	H*3	J*3	K	L*1,2 max	M	MT*3		N mod	Max Rack Force (N)*5
														Screw	Part No.		
SS R 07 ...	SS P07 W5...	12.7	4.0	20.5	20.5	45	6.35	5.65	4.5	7.6	2.9	4046	M4	M4 x 10	SSFS410	0.7	110
SS R 10 ...	SS P10 W7...	15.65	6.75	43	43	90	7.8	6.85	5.5	9.6	4.0	4046	M5	M5 x 10	SSFS510	1.0	250
SS R 15 ...	SS P15 W8...	20.0	8.25	43	43	90	8.3	10.2	6.5	11	4.5	4046	M6	M6 x 12	SSFS612	1.5	400
SS R 20 ...	SS P20 W13...	31.75	14.0	43	43	90	13.2	16.55	11	18	10.5	4046	M10	M10	-	2.0	950

## Ordering Details

Part Number SS R15 L845 (T) (C15) (D20)

(Number relates to the tooth module)

Rack Length **L = 845** mm

Bespoke values of **C** & **D** dimensions  
Leave blank if standard\*1

Fixing hole style:  
**T** = Tapped fixing holes, **N** = No Holes  
Leave blank for counterbored holes

### Notes:

- Any length of Rack within L max dimension can be supplied, but for optimum price and delivery time, lengths should be specified which maintain the C and D dimensions in the table above. In all cases unless otherwise specified by the customer, C and D dimensions will be supplied equal.
- Where longer Racks are required, standard lengths suitably matched for mounting end-to-end, will be supplied. In these cases, additional holes may be inserted to give support near the join positions. When mounting such compound Racks, care must be taken to match accurately the pitch line and tooth spacing across the join.
- The standard counterbored holes on the three smallest sizes suit low head hex socket cap screws (to DIN 6912). These screws are not universally stocked so Bishop-Wisecarver offers them as a convenience to customers in a single length for each thread size (see table). The largest size R20 Racks are thick enough to accommodate cap head screws to ISO 4762 / DIN 912, which are widely available.
- Racks in their free unmounted state are not necessarily absolutely straight. If straightness is important, the Rack should be set by bolting down to a flat surface with the rear face located against a register. Care should be taken to align parallel with the relevant [Slide](#). Adjustment for the [Pinion](#) should be provided in order to achieve the desired mesh quality. For best performance, the teeth should be lubricated with No.2 consistency lithium soap-based grease.
- The Max Rack Force is the continuous drive force that can be sustained by a well lubricated Rack used in conjunction with the appropriate Hepco [Pinion](#).

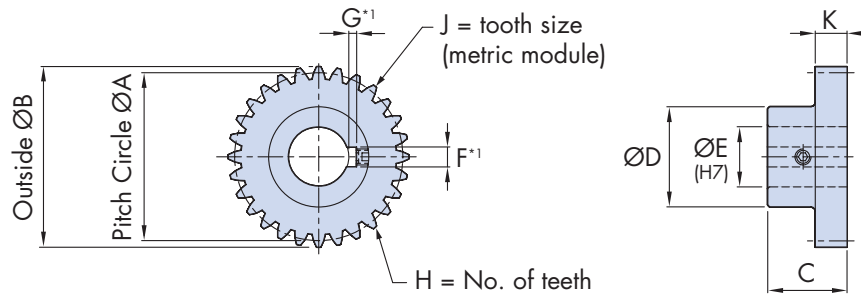


HepcoMotion Stainless Steel Pinions are compatible with Hepco Stainless Steel Racks and rack cut Single Edge Spacer Slides. They are also suitable for general use.

All Pinions have hardened teeth and are metric module with 20 pressure angle conforming to ISO 1328-1 grades. Pinions smaller than 1 module conform to ISO 1328-1 grade 10 and are supplied with a plain bore (B type), or with set screw (BK type<sup>\*1</sup>). Pinions with modules of 1 and above have hardened and ground teeth, conform to ISO grade 6. These Pinions are supplied with a plain bore (B type) or with keyway and set screw (BK type).

See Application Examples on 10 – 12

## Boss Type Pinion



Part Number	Condition <sup>*2</sup>	ISO 1328-1 grade	A	B	C	D	E	F <sup>*1</sup>	G <sup>*1</sup>	H	J mod	K
SS P07 W9 T28 ...	✖	10	19.6	21	17	16	5	-	-	28	0.7	9
SS P07 W5 T28 ...	✖	10	19.6	21	13	16	5	-	-	28	0.7	5
SS P10 W11 T42 ...	✓	6	42	44	23	30	15	5	2.3	42	1	11
SS P10 W7 T42 ...	✓	6	42	44	18.5	30	15	5	2.3	42	1	7
SS P125 W14 T34 ...	✓	6	42.5	45	25.5	30	15	5	2.3	34	1.25	14
SS P15 W8 T28 ...	✓	6	42	45	19.8	30	15	5	2.3	28	1.5	8
SS P20 W20 T27 ...	✓	6	54	58	35	40	20	6	2.8	27	2	20
SS P20 W13 T27 ...	✓	6	54	58	25	40	20	6	2.8	27	2	13

Part Number	For Use With		
SS P07 W9 T28 ...	-	SS NVE ... R	
SS P07 W5 T28 ...	SS R07 ...	-	SS NV...R
SS P10 W11 T42 ...	-	SS NSE ... R	
SS P10 W7 T42 ...	SS R10 ...	-	SS NS...R
SS P125 W14 T34 ...	-	SS NME ... R	
SS P15 W8 T28 ...	SS R15 ...	-	SS NM...R
SS P20 W20 T27 ...	-	SS NLE ... R	
SS P20 W13 T27 ...	SS R20 ...	-	SS NL...R

## Ordering Details

SS P07 W9 T28 BK

SS = Stainless Steel

Boss Type Pinion Part Number

Pinion format:

B = Pinion with plain bore

BK = Pinion with keyway and set screw<sup>\*1</sup>

### Notes:

- Small "BK" type Pinions with bores below 8mm are supplied with set screw through to the bore but without keyway. It is usual practice to secure these Pinions by means of a set screw onto a flat on the shaft or by using a taper pin.
- ✓ = Hardened all over. Teeth and bore ground. ✖ = Teeth hardened only. Teeth not ground.

The load capacity and life of HepcoMotion 'V' Slide Systems\*<sup>1</sup> will be determined by several factors. The key issues are the size and type of [Bearing](#) and [Slide](#), the presence or absence of lubrication and the magnitude and direction of loads.

Other factors including operational speed, length of stroke and environmental conditions may also have an effect\*<sup>2</sup>.

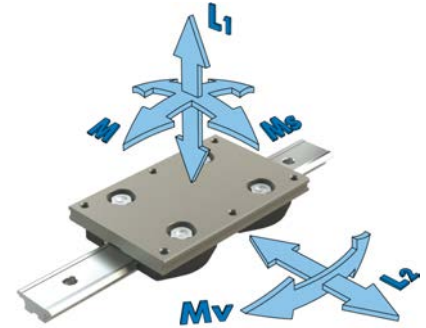
When calculating the system load and life, one of two approaches should be taken: if the system uses a conventional four-bearing [Carriage](#) (such as any of the Hepco Carriages), then this may be treated as a single item, and the load and life be determined as per the **Calculating Carriage Load Factor** section below; alternatively, each 'V' [Bearing](#) can be treated separately according to the method shown in the **Calculating 'V' Bearing Load Factor** section [35](#).

## Calculating Carriage Load Factor\*<sup>1,4</sup>

When calculating the life of a 'V' Slide System using a four-bearing Carriage, the loading on the system should be resolved into the direct load components,  $L_1$  and  $L_2$ , and the moment load components  $M$ ,  $M_v$  and  $M_s$  (see diagram on right).

To calculate the system life, the load factor  $L_F$  should first be calculated using the equation below:

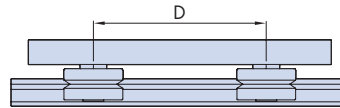
$$L_F = \frac{L_1}{L_{1(max)}} + \frac{L_2}{L_{2(max)}} + \frac{M_s}{M_{s(max)}} + \frac{M_v}{M_{v(max)}} + \frac{M}{M_{(max)}}$$



$L_F$  should not exceed 1 for any combination of loads.

The maximum direct and moment load capacities are given in the following table for [Carriages](#). Capacities are included for both dry and lubricated conditions. This refers to the 'V' contact, since all [Bearings](#) are greased internally for life. Values are based on shock-free duty. Once  $L_F$  has been determined for the application, the life is calculated as shown [35](#).

$M_{v(max)}$  and  $M_{(max)}$  are determined by multiplying the figure shown in the tables below by the spacing of the [Bearings](#),  $D$ , in meters (shown below).



Maximum Working Load Capacity - Standard Carriages* <sup>4,6</sup>														
Carriage Part Number	Dry System, Twin & DR Type Bearing					Lubricated System, Twin Type Bearing					Lubricated System, DR Type Bearing			
	$L_{1(max)}$	$L_{2(max)}$	$M_{s(max)}$	$M_{v(max)}$	$M_{(max)}$	$L_{1(max)}$	$L_{2(max)}$	$M_{s(max)}$	$M_{v(max)}$	$M_{(max)}$	$L_{1(max)}$	$L_{2(max)}$	$M_{s(max)}$	$M_{v(max)}$
	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm	N	N	Nm	Nm* <sup>6</sup>
AU SS MS 12...	80	80	0.4	40xD	40xD	240	240	1.3	120xD	120xD	Not Available			
AU SS V 20...	160	160	1.3	70xD	70xD	500	400	4.5	200xD	250xD	760	1200	7	600xD 380xD
AU SS S 25...	320	320	3.6	160xD	160xD	960	960	11	480xD	480xD	1600	3000	17	1500xD 800xD
AU SS S 35...	320	320	5	160xD	160xD	960	960	15	480xD	480xD	1600	3000	25	1500xD 800xD
AU SS S 50...	320	320	7.3	160xD	160xD	960	960	22	480xD	480xD	1600	3000	37	1500xD 800xD
AU SS M 44...	640	640	13	320xD	320xD	3000	3000	60	1500xD	1500xD	3600	6000	72	3000xD 1800xD
AU SS M 60...	640	640	18	320xD	320xD	3000	3000	84	1500xD	1500xD	3600	6000	100	3000xD 1800xD
AU SS M 76...	640	640	23	320xD	320xD	3000	3000	108	1500xD	1500xD	3600	6000	129	3000xD 1800xD
AU SS L 76...	1440	1440	50	720xD	720xD	6000	6000	210	3000xD	3000xD	8000	10000	280	5000xD 4000xD

### Notes:

- The maximum values of  $L_A$  and  $L_R$ , and the magnitudes of the system Basic Life for each [Bearing](#) type relate to the performance of complete systems. Tests have shown these figures to be more reliable than working from the theoretical static and dynamic load capacities ( $C$  and  $C_o$ ) of the bearings. Values of  $C$  and  $C_o$  have been included in tabulated data on the relevant Bearing pages as a means of comparison with other systems.
- The calculations within this section assume that the linear stroke involves a number of complete [Bearing](#) revolutions. If the stroke of any application is less than five times the Bearing outside diameter, calculate the distance traveled as if it moves five Bearing diameters per stroke. Systems operating at speeds in excess of 8 m/s may require additional calculation. Please contact Bishop-Wisecarver for assistance.
- For the purposes of the Load/Life Calculations on this page, the axial load  $L_A$  is the load in the axial direction that the [Bearing](#) can accept from a 'V' [Slide](#) engaged in its outer ring. Since the line of force is some distance removed from the axis of the Bearing, this value is much less than the theoretical axial load capacity, quoted on the relevant Bearing page.





### Calculating 'V' Bearing Load Factor\*1,3,4

Many systems do not use a standard four-bearing **Carriage**. In such cases it is necessary to use conventional statics calculations to determine the loading on each Bearing in the system, by resolving loads into axial (L<sub>A</sub>) and radial (L<sub>R</sub>) components.

The maximum L<sub>A</sub> and L<sub>R</sub> load capacities for all types of Hepco 'V' **Bearing** are given in the table below. Capacities are included for both 'dry' and 'lubricated' conditions. This refers to the 'V' contact, since all Bearings are greased internally for life. Values are based on shock-free duty.

The load capacities stated in the table below assume that **Bearings** are used with **Slides** equal to or larger than the preferred Slide selection for that Bearing size. For details of the preferred sizes, see tables [24–25](#). For loading of Bearings with smaller Slides, please contact Bishop-Wisecarver.

To calculate the system life, the load factor L<sub>F</sub> should first be calculated using the equation below: L<sub>F</sub> should not exceed 1 for any combination of loads.



$$L_F = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}}$$

Maximum Working Load Capacity (N)*1,4									
Twin Type Bearing					Double Row (DR) Type Bearing				
Part Number	Dry System		Lubricated		Part Number	Dry System		Lubricated	
	L <sub>A(max)</sub>	L <sub>R(max)</sub>	L <sub>A(max)</sub>	L <sub>R(max)</sub>		L <sub>A(max)</sub>	L <sub>R(max)</sub>	L <sub>A(max)</sub>	L <sub>R(max)</sub>
...J13...	20	40	60	120	-	-	-	-	-
...J18...	40	80	125	200	...J18 DR...	40	80	190	600
...J25...	80	160	240	480	...J25 DR...	80	160	400	1500
...J34...	160	320	750	1500	...J34 DR...	160	320	900	3000
...J54...	360	720	1500	3000	...J54 DR...	360	720	2000	5000

Once L<sub>F</sub> has been determined for each **Bearing**, the life can be calculated as follows:

### Calculating Carriage or Individual 'V' Bearing Life\*2,3,5,6

Life in km can be calculated using one of the two equations below. In these equations, the Basic Life is taken from the table below in respect of the Bearing type and the lubrication condition applicable.

#### Dry System

$$\text{Life (km)} = \frac{\text{Basic Life}}{(0.03 + 0.97L_F)^2}$$

#### Lubricated System

$$\text{Life (km)} = \frac{\text{Basic Life}}{(0.03 + 0.97L_F)^3}$$

Basic Life*1,4					
Twin Type Bearing			Double Row (DR) Type Bearing		
Part Number	Dry System	Lubricated	Part Number	Dry System	Lubricated
...J13...	40	40	-	-	-
...J18...	50	75	...J18 DR...	50	75
...J25...	70	40	...J25 DR...	70	70
...J34...	100	100	...J34 DR...	100	150
...J54...	150	200	...J54 DR...	150	400

- In the above calculations, the term 'lubricated' refers to the contact between the **Slide** and **Bearing** 'V's. This lubrication may best be achieved using Hepco **Cap Seals**, **Lubricators** or the Bleed Lubrication facility [1](#). However, other methods that ensure the presence of suitable lubrication are acceptable.
- When a system consists of more than four **Bearings** per **Carriage** (see Application Example [10](#)), it cannot always be guaranteed that the load will share equally between all Bearings. In such cases, it is recommended that Controlled Height Bearings are specified (where available) and that the system is de-rated to allow for the life of the most heavily laden Bearing.
- For some sizes of DR **Bearings**, the actual life for applications with mainly L2/radial loads may be higher than the calculations indicate. This is because the calculations are simplified for easy use. Please contact Bishop-Wisecarver for details in instances where a higher system life is required.



Systems incorporating [Track Rollers](#) running on [Flat Tracks](#) or the flat faces of [Single Edge Spacer Slides](#) will require a different calculation to determine the load and life.

Track Rollers only have a radial load capacity stated, as they are not usually loaded axially. Their pure rolling contact with the Track means that they do not need to be de-rated for use in unlubricated applications (although it is recommended that the Tracks and Rollers be lightly oiled for best performance).

## Calculating the System Load Factor\*1

To calculate the Roller life, the load factor  $L_F$  should first be calculated using the equation below:

$L_F$  should not exceed 1.

$$L_F = \frac{L_R}{L_{R(max)}}$$

The maximum radial load capacity  $L_{R(max)}$  for the Hepco range of [Track Rollers](#) is stated below:

Max Working Load Capacity*1			
Narrow Roller Type	$L_{R(max)}$	Wide Roller Type	$L_{R(max)}$
	N		N
LRN 18...	400	...R 18...	600
LRN 25...	1000	...R 25...	1600
LRN 34...	2000	...R 34...	3200

## Calculating Track Roller Life\*2

With  $L_F$  determined for each Roller, the life in km can be calculated using the equation below. Please note that the 'Basic Life' for all Track Rollers is 750 km, so a lookup table is not required.

$$\text{Life (km)} = \frac{750}{L_F^3}$$

## Load Capacity of the Track Roller Running Surface

In a system using a Track Roller running on a flat surface, it may be necessary to reduce the maximum loads applied if the track is not sufficiently hard. All Hepco [Flat Tracks](#) are hardened, and these can be used in conjunction with Hepco Track Rollers up to the maximum load capacities stated in the table above. Even higher loads up to the static load capacity,  $C_o$ , of the bearings (see Track Roller [29-31](#)) are possible without damage.

For softer running faces, such as the rear face of the Hepco [Single Edge Spacer Slides](#), the maximum [Track Roller](#) loads are reduced as stated in the table below:

Track Roller Maximum Load Capacities (N)			
Description of Track Roller Running Surface	Used with Track Roller type		
	SSLRN18...& SS...R18...	SSLRN25...& SS...R25...	SSLRN34...& SS...R34...
Hepco Flat Tracks FT...	The load is limited by the $L_{R(max)}$ figure for the Track Roller		
Rear of Hepco Single Edge Slide	240	400	540

It should be noted that while a softer running face will limit the maximum load that can be exerted by a [Track Roller](#), the life of the Track Roller at any given load is not affected.

## Notes:

1. The values of  $L_R$ , and the system Basic Life for each [Track Roller](#) relate to the performance of complete systems. Tests have proven these figures to be more reliable than working from the theoretical static and dynamic load capacities ( $C$  and  $C_o$ ) of the bearing. Values of  $C$  and  $C_o$  have been included in tabulated data on the relevant Track Roller pages as a means of comparison with other systems.
2. The calculations within this section assume that the linear stroke involves a number of complete [Track Roller](#) revolutions. If the stroke of any application is less than five times the Track Roller outside diameter, then please calculate the distance traveled as if it moves five Track Roller diameters per stroke. Systems operating at speeds in excess of 8 m/s may require additional calculation. Please contact Bishop-Wisecarver for assistance.

## 'V' Slides

Material and finish:	Special martensitic stainless steel conforming generally to AISI 420 series, ground on all main surfaces to N6.
Hardness of 'V' surface:	Generally 52 HRC
Straightness:	Generally 0.2mm/m unmounted* <sup>1</sup>
Parallelism:	'V' and datum faces 0.013mm/m non-accumulative
Hole Pitch Tolerance:	±0.1mm non-accumulative

## Flat Tracks & Racks

Material and finish:	Special martensitic stainless steel conforming generally to AISI 420 series, ground on all main surfaces to N6.
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## Bearings & Track Rollers

Raceways and balls:	Stainless steel AISI 440C
Seals:	Nitrile rubber
Cage:	Plastic
Studs:	Stainless steel AISI 303
BH... 'E' base plate:	Stainless steel AISI 316
Temperature range:	-20°C to +120°C
Grease:	Lithium soap grease NLGI 2

## Carriage Plates, End Stops, & Flange Clamps [↓](#)

Material:	High strength aluminum alloy
Finish:	U.S. Department of Agriculture approved surface treatment

## Carriage Plate & Slide Counterbore Plugs

Material:	Plastic
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## Cap Seals

Material:	Body: Thermoplastic elastomer Inserts: Impact resistant plastic Wipers: Felt
Temperature range:	-20°C to +60°C

## Lubricators

Material:	Impact resistant plastic with felt wiper.
Temperature range:	-20°C to +60°C

## Pinions

Material and finish (< Mod 1):	AISI 420 stainless steel. Unground. Teeth hardened. ISO 1328-1 accuracy grade 10.
Material and finish (≥ Mod 1):	AISI 420 stainless steel. Teeth and bore ground to N5 finish. Teeth hardened. ISO 1328-1 accuracy grade 6.

## Frictional Resistance for 'V' Slide Systems

Coefficient of friction (without [Cap Seals](#) or [Lubricators](#)) = 0.02

Cap Seals and Lubricators add friction as follows:

Four Cap Seals per <a href="#">Carriage</a>	SSCS18 = 4N, SSCS25 = 7N, SSCS34 = 15N, SSCS54 = 28N
Two Lubricators per Carriage	SSLB12 = 1N, SSLB20 = 1.5N, SSLB25 = 2.5N, SSLB44 = 3N, SSLB76 = 4N

## External Lubrication

[Cap Seals](#) should be lubricated with grease NLGI consistency No. 2.

[Lubricators](#) should be oiled using 68 cSt viscosity or similar oil. Food compatible lubricants can also be used.

## Maximum Linear Speeds for 'V' Slides & Bearings and Flat Tracks & Rollers

Unlubricated 'V' Slides =	2 m/s	} Higher speeds are possible. Speed depends upon stroke, duty and environmental conditions.
Lubricated 'V' Slides and all Flat Track applications =	8 m/s	

## Notes:

1. The straightness figure quoted above for Slides is for the unmounted condition. Slides can be set straight during the assembly process.
2. Material specifications may change for reasons of technical advantage or availability.

### **Components & Accessories**

DualVee®  
MadeWell®  
GV3  
SL2  
PRT2  
HDS2  
HDRT  
MCS  
Motor Mounts  
Gantry Brackets  
Wrenches

### **Manual Linear Guide Systems**

DualVee®  
UtiliTrak®  
MinVee®  
GV3  
Simple Select®  
SL2  
HDS2  
MHD  
HTS

### **Actuated Linear Guide Systems**

LoPro®  
XLA™  
ECO60™  
SlickStick™  
SteadyRail™  
HDLS  
HDCS  
PDU2  
DAPDU2  
SBD  
PSD  
SDM  
DLS

### **Rotary Guide Systems**

PRT2  
DTS2  
DTS  
DTS+  
ALR  
HDRT  
1-Trak  
GFX

### **Robot Transfer Units**

DualVee® RTU  
LoPro® RTU

### **Custom Solutions**

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Custom Bearings  
Custom Sub-assemblies  
Engineering Services  
Large Diameter Ring Guides and Track

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Email: **Sales@bwc.com**

### **Corporate Office**

Bishop-Wisecarver  
2104 Martin Way  
Pittsburg, CA 94565

### **Quality Certifications**



- Certified Bay Area Green Business
- Certified Evergreen

### **Certifications & Compliance**

- EN 9100:2018
- JISQ 9100:2016
- ISO 13485 & GMP Compliance
- Responsible Minerals Initiative
- RoHS
- International Traffic in Arms Regulations Compliant

