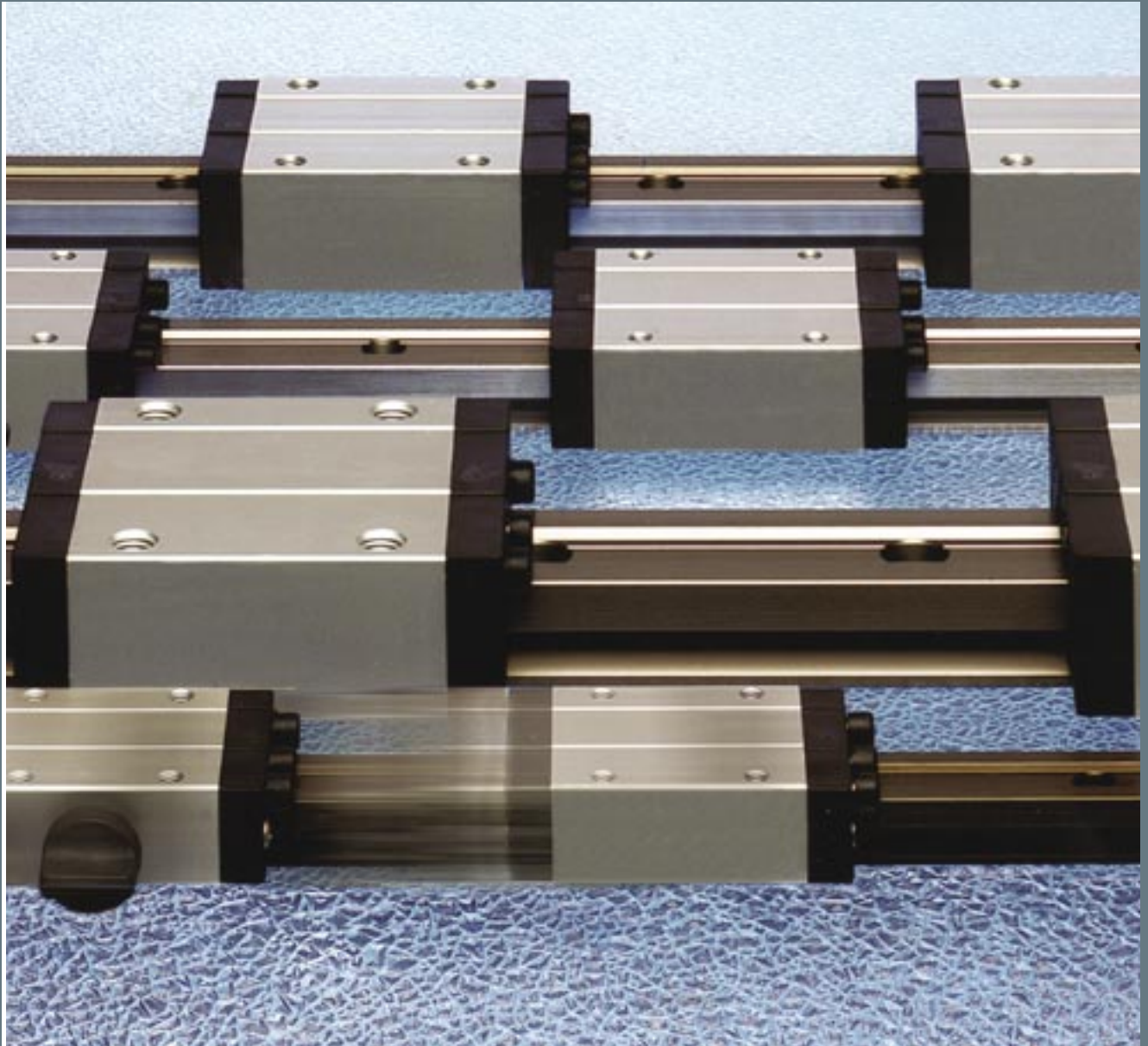




DryLin® T Linear Guide System
Maintenance-Free, Adjustable,
and Quiet

DryLin® T Selection Guide



Series TW-01-XX Adjustable clearance

- Pre-set from factory for optimal standard clearance
- Clearance can be reduced for higher precision requirements
- Clearance can be increased to compensate for poor mounting surface tolerances



Series TWA-01-XX Automatic

- Clearance automatically adjusts
- Maintains better precision over lifetime vs. TW-01 version



Series TW-HKA Manual Hand Clamp

- Allows a simple hand-clamp function for light-duty applications
- Not recommended for vertical applications



Series TW-02-XX Heavy Duty

- Better for aggressive and heavy industrial environments due to metal end caps
- Ideal for applications containing weld splatter, dirt, wood chips, etc.
- Same loading as Series TW-01



Miniature

- Lightweight
- Ideal for tight design constraints
- Cost-effective



Series TWBM Heavy-Duty Clamps

- Offer higher clamping force than TW-HKA
- Holding forces up to 112 lbs

Temperature

Maximum Load

-40°F to +194°F
(-40°C to +90°C)

From
900 lbs (4000 N)
to
3140 lbs (14,000 N)

-40°F to +194°F
(-40°C to +90°C)

From
900 lbs (4000 N)
to
3140 lbs (14,000 N)

-40°F to +194°F
(-40°C to +90°C)

From
900 lbs (4000 N)
to
3140 lbs (14,000 N)

-40°F to +194°F
(-40°C to +90°C)

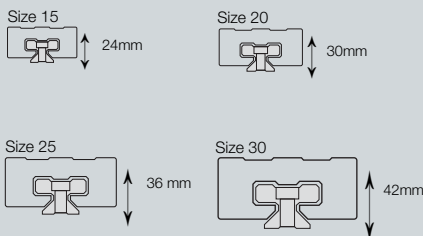
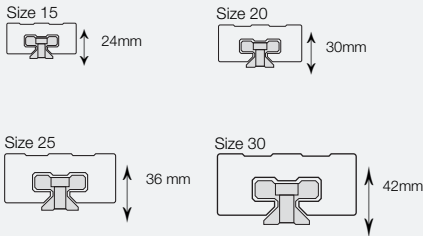
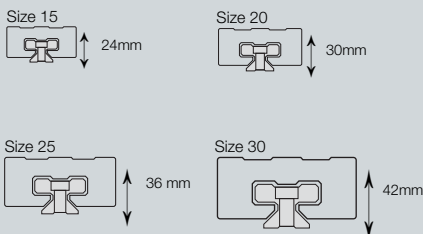
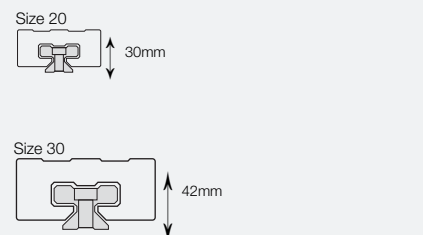
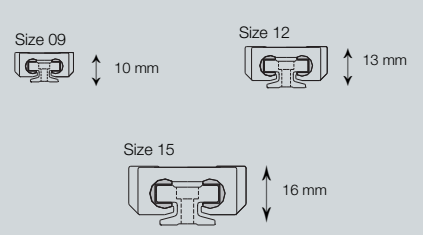
From
900 lbs (4000 N)
to
3140 lbs (14,000 N)

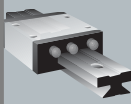
-40°F to +194°F
(-40°C to +90°C)

From
108 lbs (480 N)
to
315 lbs (1,400 N)

-40°F to +194°F
(-40°C to +90°C)

NA

	Maximum Speed	Maximum Rail Length	Size Range	Rail Material	Carriage Material
	49 fps (15 m/s)	12 ft (4m upon request)		Hard-Anodized Aluminum	Plastic liners Aluminum carriages Stainless steel fasteners
	49 fps (15 m/s)	12 ft (4m upon request)		Hard-Anodized Aluminum	Plastic liners Aluminum carriages Stainless steel fasteners
	49 fps (15 m/s)	12 ft (4m upon request)		Hard-Anodized Aluminum	Plastic liners Aluminum carriages Stainless steel fasteners
	49 fps (15 m/s)	12 ft (4m upon request)		Hard-Anodized Aluminum	Plastic liners Anodized Aluminum
	49 fps (15 m/s)	6.56 ft (2000 mm)		Hard-Anodized Aluminum	Plastic liners Chromated zinc carriage
	NA	NA		Hard-Anodized Aluminum	Anodized Aluminum



DryLin® T Linear Guide Systems

DryLin® T Linear
Guide Systems

Telephone 1-800-521-2747
Fax 1-401-438-7270

Internet: <http://www.igus.com>
email: sales@igus.com
QuickSpec: <http://www.igus.com/iglide-quickspec>

Technical Data

Sliding elements:

Self-lubricating polymer

Material:

iglide® J*

Max. surface speed:

49 fps (15 m/s)

Temperature range:

-40° F to +194°F

(-40 °C to +90 °C)

* Other materials upon request

Special Features



Cleanroom certified -
IPA Fraunhofer



ESD compatible
(electrostatic
discharge)



Free of toxins -
RoHS 2002/95/EC



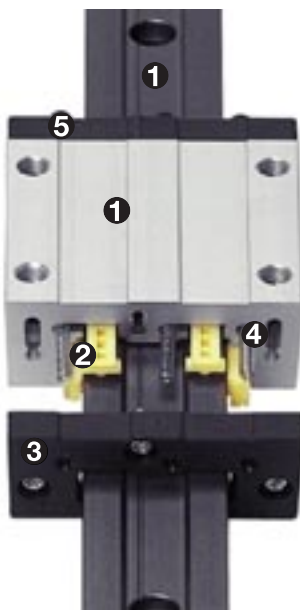
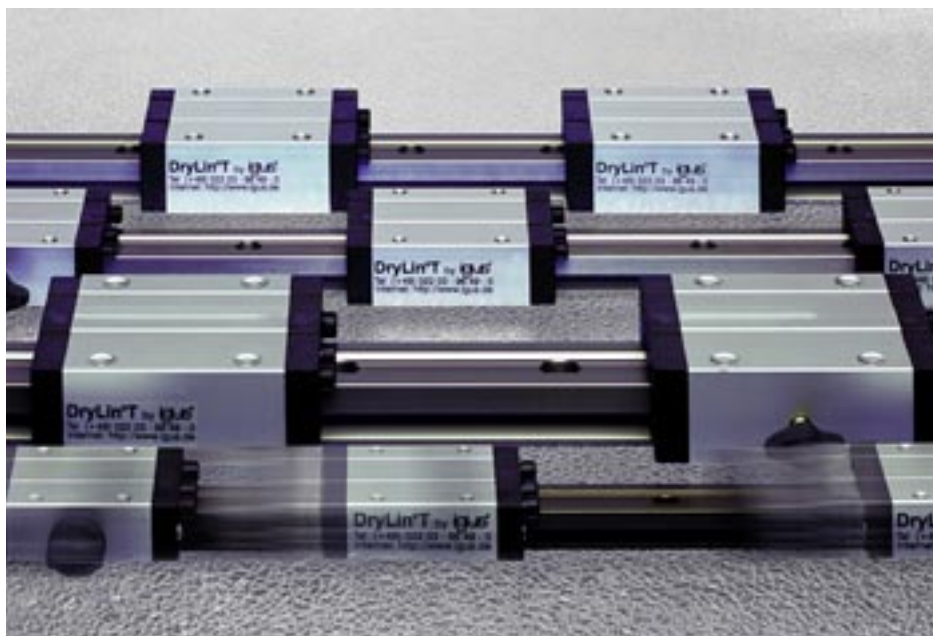
DryLin® linear guide system
in a treatment machine



Valve machining produces
an extreme environment



DryLin® T linear guide
system in pneumatic
doors of tool changers



- ❶ The rail is hard anodized, the aluminum carriage housing is clear anodized, or chromated zinc (mini series)
- ❷ 6 sliding iglide® J elements act as guide bearings
- ❸ Clearance can be adjusted manually or automatically (depending on series)
- ❹ All steel parts are galvanized or stainless steel
- ❺ The end plate is solid plastic with an optional aluminum - HD carriage option

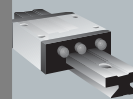
Technical Data

Guide Rails

Material	Aluminum, extruded
Substance	6063-T6 or 6060-T66 (Al Mg Si 0.5)
Coating	Hard-anodized aluminum, .002" (50 µm)
Hardness	500 HV

Sliding Carriages

Base Structure	Aluminum, extruded section (TK01/TKA/TKC1), Zinc (TK04)
Material	6060-T66 (Al Mg Si 0.5)
Coating	Clear Anodized
Sliding Elements	iglide® J, maintenance-free, plain bearing material
Bolts	Stainless steel
Springs	Stainless steel
Cover	Plastic or aluminum (HD version)
Max. Surface Speed	49 ft/s (15 m/s)
Temperature Range	-40°F to 194°F (-40°C to +90°C)



Features

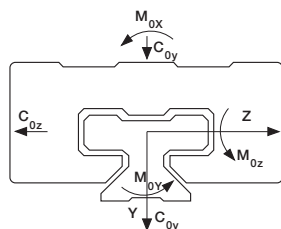
- With low inertia rates, high accelerations and speeds up to 49 fps (15 m/s) are possible
- Oil and maintenance-free
- Ideal for use in lab, food-processing, and packaging machinery
- Excellent corrosion resistance
- Dimensionally interchangeable with common linear ball bearings
- Excellent in dirty environments without the need of wipers or seals



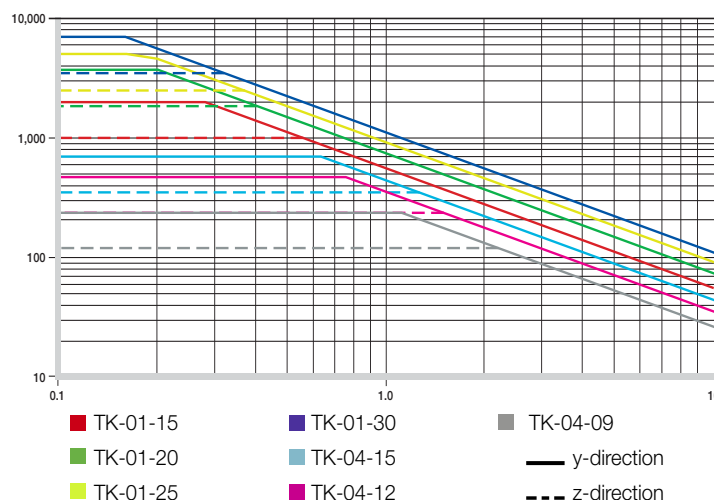
DryLin® T in a demanding packaging machine application

DryLin® T - Load / Speed Capacity

DryLin® T Linear Guide Systems can hold high static loads because of large surface areas. The maximum load in the y-direction is higher than in the z-direction, since the bearing surface is doubled in the y-direction. With a low rate of inertia, high accelerations and short term extreme speeds up to 49 ft/s (15 m/s) are possible.



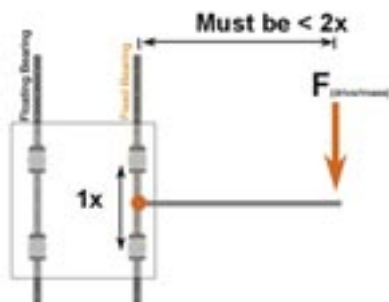
Designation of load directions



Type	C_{0Y}		$C_{0(-)Y}$		C_{0Z}		M_{0X}		M_{0Y}		M_{0Z}	
	lbs	(kN)	lbs	(kN)	lbs	(kN)	ft lbs	(Nm)	ft lbs	(Nm)	ft lbs	(Nm)
01-15	900	4	900	4	450	0.24	24	3.4	18	1.8	18	1.8
01-20	1665	7.4	1665	7.4	833	0.48	62	9.2	32	4.4	32	4.4
01-25	2250	10	2250	10	1125	0.7	92	17	48	8	48	8
01-30	3140	14	3140	14	1570	2	148	32	74	25	74	25
04-09	108	.48	108	.48	54	3.7	2.5	85	1.3	45	1.3	45
04-12	215	.96	215	.96	108	5	6.8	125	3.2	65	3.2	65
04-15	315	1.4	315	1.4	157	7	12.5	200	6.0	100	6.0	100

Table 20.1: DryLin® T permissible static load capacity

Eccentric Forces



2:1 Rule = permissible distances of the applied forces

The 2:1 Rule

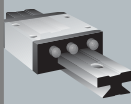
When using linear plain bearings it is important to ensure that the acting forces follow the 2:1 Rule (see drawing). If either the load or the drive force (F) is greater than twice the bearing length (1X), then a binding or interrupted motion may occur.

If the location of the drive force or load cannot be changed, simply increase the distance between the bearings, or create a counterbalance to move the center-of-gravity back within the 2 to 1 ratio.



Online Lifetime Calculation
www.igus.com





DryLin® T - Floating Systems

Maximum float = .04" (1 mm)



Standard Version

Part-No.
Standard

TW-01-15
TW-01-20
TW-01-25
TW-01-30



Horizontal Float "LLZ"

Part-No.
Floating Horizontal

TW-01-15HF
TW-01-20HF
TW-01-25HF
TW-01-30HF



Vertical Float "LLY"

Part No.
Floating Vertical

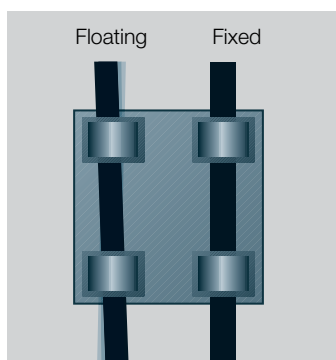
TW-01-15VF
TW-01-20VF
TW-01-25VF
TW-01-30VF

DryLin® T - Fixed and Floating Bearing Mounting Instructions

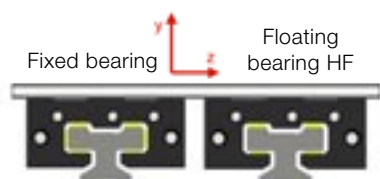
When using systems with 2 parallel rails, one side must be designated as the "fixed" rail, and the opposite side the "floating" rail.

Why use floating bearings?

- promotes smooth gliding performance and maximizes bearing life
- prevents binding caused by parallelism and angle errors
- decreases necessary drive force and wear by minimizing friction-forces
- Enhances the precision of the system over the bearings' lifetime.
- Reduce assembly time and cost



Automatic compensation of parallelism errors



Installation variation horizontal with floating bearing in the Z-direction

Fixed Bearings

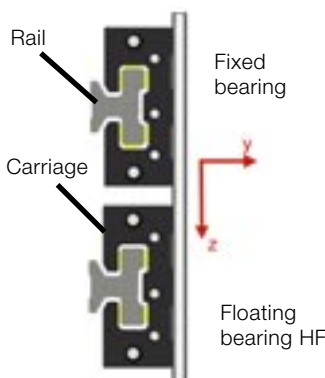
The "fixed" bearing rail should be positioned closest to the drive force. This rail will determine the precision of the system; no system should contain more than two "fixed" bearings.

Floating/Self-Aligning Bearings

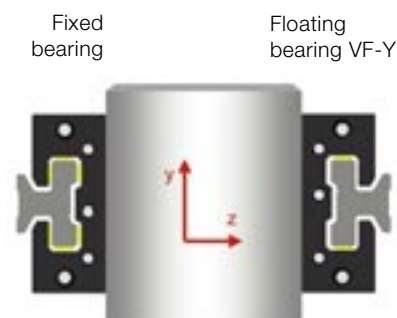
The "floating" rail should be the rail located furthest from the drive force. It is to act only as a guide, and will compensate for any misalignments or angle errors in the system ensuring proper functionality.

Mounting Surfaces

The mounting surfaces for rails and bearings should have a very flat surface (e.g milled surface) in order to enhance performance. Variations in these surfaces may be compensated for by using floating bearings.



Installation variation lateral with floating bearing in the Z-direction



Horizontal mounting version with floating bearing in the Y-direction and lateral mounting carriage

Cleanroom Suitability and ESD Compatibility of DryLin®

Linear Guide Systems by igus® GmbH

All DryLin® guide systems are clearly qualified for clean room applications. The differentiation between the various clean room classes is only dependent on load and speed of the application. The combination of iglide® J and hard anodized aluminum is classified as level 1 in the ESD compatibility according to SEMI E78-0998 (Highest rank).

The following DryLin® guide systems by igus® were examined: N40, W10, T25 and T30.

See below for detailed results.

Linear guide system DryLin® TK-10-30-01:

“For the linear guide system DryLin® TK-10-30-01 by igus®, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2 µm, 0.3 µm, 0.5 µm, and 5 µm with motion speed of $v = 0.1$ m/s, to clearly derive suitability for clean rooms classified as ISO Class 3 according to DIN EN ISO 14644-1.”

Linear guide system DryLin® NK-02-40-02:

“For the linear guide system DryLin® NK-02-40-02 by igus®, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2 µm, 0.3 µm, 0.5 µm, and 5 µm with motion speed of $v = 1$ m/s, to clearly derive suitability for clean rooms classified as ISO Class 6 according to DIN EN ISO 14644-1.”



The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system DryLin® NK-02-40-02 can be classified as “level 1” (Highest rank). See Fraunhofer IPA Report No.: IG 0308-295 73.

Linear guide system DryLin® TK-01-25-02:

“For the linear guide system DryLin® TK-01-25-02 by igus®, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2 µm, 0.3 µm, 0.5 µm, and 5 µm with motion speed of $v = 1$ m/s, to clearly derive suitability for clean rooms classified as ISO Class 5 according to DIN EN ISO 14644-1.”

The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system DryLin® TK-01-25-02 can be classified as “level 1” (Highest rank).

Linear guide system DryLin® WK-10-40-15-01:

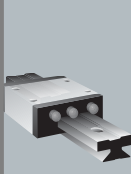
“For the linear guide system DryLin® WK-10-40-15-01 by igus®, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2 µm, 0.3 µm, 0.5 µm, and 5 µm with motion speed of $v = 1$ m/s, to clearly derive suitability for clean rooms classified as ISO Class 6 according to DIN EN ISO 14644-1.”

The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system DryLin® WK-10-40-15-01 can be classified as “level 1” (Highest rank).

See Fraunhofer IPA Report No.: IG 0308-295 74.

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS





DryLin® T Linear Guide Systems - Adjustable Clearance

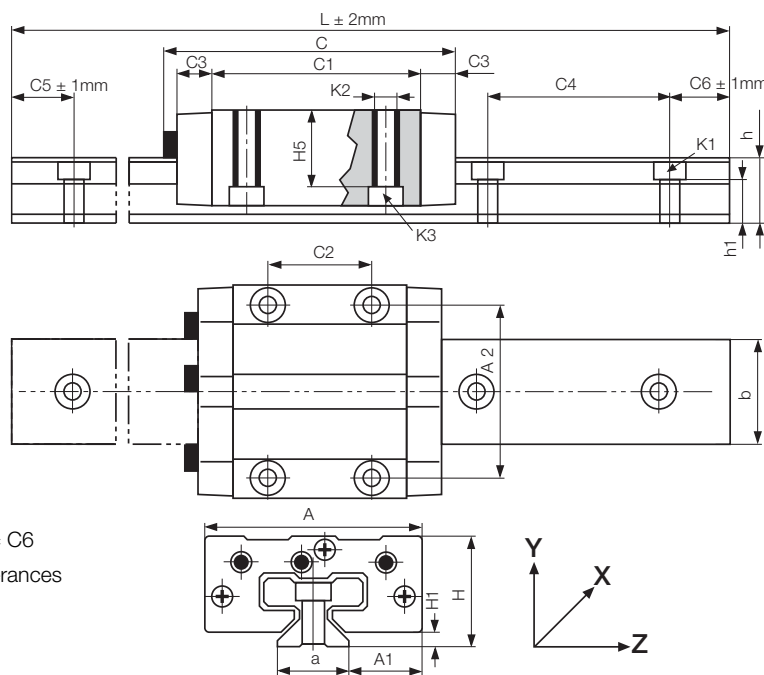
DryLin® T Linear Guide Systems

Telephone 1-800-521-2747
Fax 1-401-438-7270

Internet: <http://www.igus.com>
email: sales@igus.com
QuickSpec: <http://www.igus.com/iglide-quickspec>



- Linear plain bearings
- Adjustable clearance
- Maintenance-free, dry operation
- Corrosion resistant
- Hard anodized aluminum rails (6063-T6)
- Clear anodized aluminum carriage
- Standard bore pattern symmetrical for rail, C5 = C6
- No charge for rails cut to standard C5 + C6 tolerances



DryLin® T guide rails

Part No.	Weight (kg/m)	L max. (mm)	a -0.2 (mm)	C4 (mm)	C5 min. max. (mm) (mm)	C6 min. max. (mm) (mm)	h	h1	K1 for Screw DIN 912	b (mm)	ly (mm²)	lz (mm²)	Wby (mm³)	Wbz (mm³)
TS-01-15	0.6	3650	15	60	20 49	20 49	15.5	10.0	M 4	22	6440	4290	585	488
TS-01-20	1.0	3650	20	60	20 49	20 49	19.0	12.3	M 5	31	22570	11520	1456	1067
TS-01-25	1.3	3650	23	60	20 49	20 49	21.5	13.8	M 6	34	34700	19300	2041	1608
TS-01-30	1.9	3650	28	80	20 59	20 59	26.0	15.8	M 8	40	70040	40780	3502	2832

Order example: TS-01-15, 2000 for a guide rail TS-01-15 of 2 m length

For rails without mounting holes, please use part number suffix "S"

*4000 mm length available upon request

DryLin® T carriages

Part No.	Weight (kg)	H ±0.35 (mm)	A (mm)	C (mm)	A1 ±0.35 (mm)	A2 (mm)	C1 (mm)	C2 (mm)	C3 (mm)	H1 ±0.35 (mm)	H5 (mm)	K2 Thread	Torque Max. (Nm)	K3 for Screw DIN 912
TW-01-15	0.11	24	47	68	16.0	38	50	30	9	4.0	16.0	M 5	1.5	M 4
TW-01-20	0.19	30	63	81	21.5	53	61	40	10	5.0	19.8	M 6	2.5	M 5
TW-01-25	0.29	36	70	90	23.5	57	68	45	11	5.0	24.8	M 8	6.0	M 6
TW-01-30	0.50	42	90	103	31.0	72	79	52	12	6.5	27.0	M 10	15.0	M 8

Order examples: TW-01-20 for a guide carriage

TW-01-20, LLy for a guide carriage with floating bearing in y-direction, 1mm additional clearance

TW-01-20, LLz for a guide carriage with floating bearing in z-direction, 1mm additional clearance

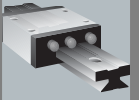
Structure – part no.

TK	-01	-15	-2	-500
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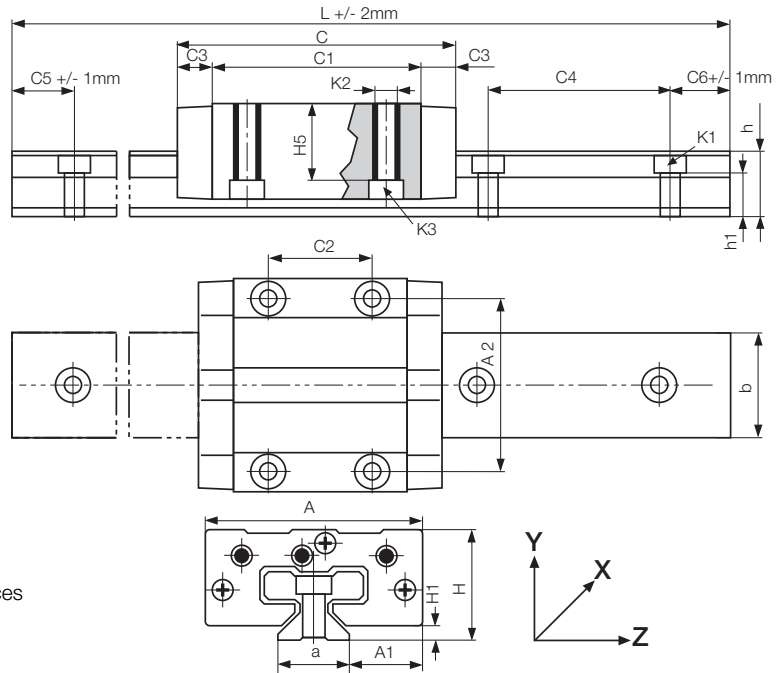
Length of rail (mm)
Number of carriages
Size
Type
Complete set

This order example (TK-01-15-2-500) corresponds to a complete DryLin® system of size 15 with 2 carriages and 500 mm rail length. Order TK-01-15-2-500-LLY for a complete system with floating bearing in y-direction.

DryLin® T Linear Guide Systems - Automatic



- Automatic clearance adjustment
- Linear plain bearings
- Maintenance-free, dry operation
- Corrosion resistant
- Hard anodized aluminum rails (6063-T6)
- Clear anodized aluminum carriage
- Standard bore pattern symmetrical for rail, $C5 = C6$
- No charge for rails cut to standard $C5 + C6$ tolerances
- Clearance adjusts when applied load is removed



DryLin® T guide rails

Part No.	Weight (kg/m)	L max. (mm)	a -0.2 (mm)	C4 (mm)	C5 min. (mm)	C5 max. (mm)	C6 min. (mm)	C6 max. (mm)	h (mm)	h1 (mm)	K1 for Screw DIN 912 (mm)	b (mm)	ly (mm ²)	lz (mm ²)	Wby (mm ²)	Wbz (mm ²)
TS-01-15	0.6	3650	15	60	20	49.5	20	49.5	15.5	10.0	M 4	22	6440	4290	585	488
TS-01-20	1.0	3650	20	60	20	49.5	20	49.5	19.0	12.3	M 5	31	22570	11520	1456	1067
TS-01-25	1.3	3650	23	60	20	49.5	20	49.5	21.5	13.8	M 6	34	34700	19300	2041	1608
TS-01-30	1.9	3650	28	80	20	59.5	20	59.5	26.0	15.8	M 8	40	70040	40780	3502	2832

Order example: TS-01-15, 2000 for a guide rail TS-01-15 of 2 m length

For rails without mounting holes, please use part number suffix "S"

*4000 mm length available upon request

DryLin® T carriages with automatic clearance adjustment

Part No.	Weight (kg)	H ±0.35 (mm)	A (mm)	C (mm)	A1 ±0.35 (mm)	A2 (mm)	C1 (mm)	C2 (mm)	C3 (mm)	H1 ±0.35 (mm)	H5 (mm)	K2- Thread	Torque max. (Nm)	K3 for Screw DIN 912
TWA-01-15	0.11	24	47	68	16.0	38	50	30	9	4.0	16.0	M 5	1.11	M 4
TWA-01-20	0.19	30	63	81	21.5	53	61	40	10	5.0	19.8	M 6	1.84	M 5
TWA-01-25	0.29	36	70	90	23.5	57	68	45	11	5.0	24.8	M 8	4.43	M 6
TWA-01-30	0.50	42	90	103	31.0	72	79	52	12	6.5	27.0	M 10	11.06	M 8

Order examples: TWA-01-20 for a guide carriage

TWA-01-20, LLy for a guide carriage with floating bearing in y-direction, 1mm additional clearance

TWA-01-20, LLz for a guide carriage with floating bearing in z-direction, 1mm additional clearance



DryLin® T used in packaging machines

DryLin® T Linear Guide Systems

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS

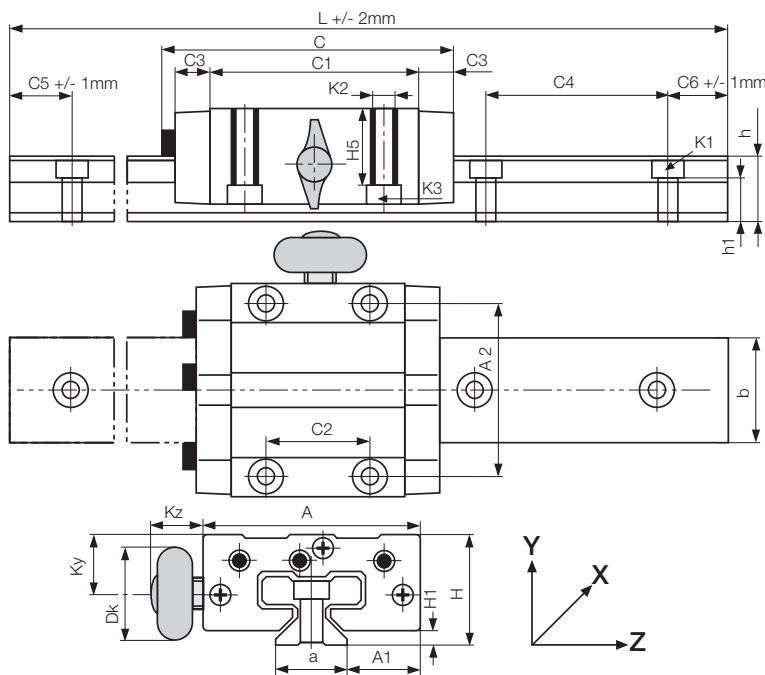
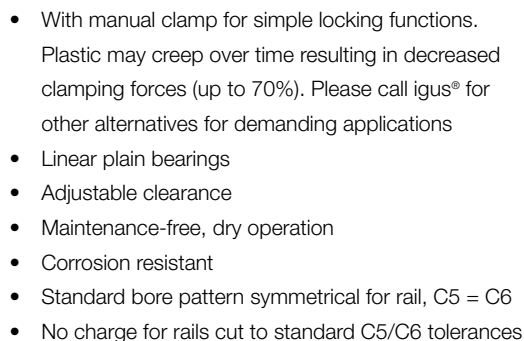




DryLin® T Linear Guide Systems

Telephone 1-800-521-2747
Fax 1-401-438-7270

Internet: <http://www.igus.com>
email: sales@igus.com
QuickSpec: <http://www.igus.com>



Part No.	Weight	L	a	C4	C5	C5	C6	C6	h	h1	K1	b	ly	lz	Wby	Wbz
		max.	-0.2		min.	max.	min.	max.			for Screw					
	(kg/m)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)			DIN 912	(mm)	(mm²)	(mm³)	(mm³)	(mm³)
TS-01-15	0.6	3650	15	60	20	49.5	20	49.5	15.5	10.0	M 4	22	6440	4290	585	488
TS-01-20	1.0	3650	20	60	20	49.5	20	49.5	19.0	12.3	M 5	31	22570	11520	1456	1067
TS-01-25	1.3	3650	23	60	20	49.5	20	49.5	21.5	13.8	M 6	34	34700	19300	2041	1608
TS-01-30	1.9	3650	28	80	20	59.5	20	59.5	26.0	15.8	M 8	40	70040	40780	3502	2832

Order example: TS-01-15, 2000 for a guide rail TS-01-15 of 2m length

Part No.	Weight	H	A	C	A1	A2	C1	C2	C3	H1	H5	K2	Torque	K3 for
	(kg)	±0.35 (mm)	(mm)	(mm)	±0.35 (mm)	(mm)	(mm)	(mm)	(mm)	±0.35 (mm)	(mm)	Thread	Max. (Nm)	Screw DIN 912
TW-HKA-01-15	0.11	24	47	74	16.0	38	50	30	9	4.0	16.0	M 5	1.5	M 4
TW-HKA-01-20	0.19	30	63	87	21.5	53	61	40	10	5.0	19.8	M 6	2.5	M 5
TW-HKA-01-25	0.29	36	70	96	23.5	57	68	45	11	5.0	24.8	M 8	6.0	M 6
TW-HKA-01-30	0.50	42	90	109	31.0	72	79	52	12	6.5	27.0	M 10	15.0	M 8

Part No.	Size	Kz	Ky	Dk	Thread of the Clamp
TW-HKA-01-15	15	19.0	11.5	20.0	M6
TW-HKA-01-20	20	18.0	15.0	28.0	M8
TW-HKA-01-25	25	17.0	19.0	28.0	M8
TW-HKA-01-30	30	20.0	21.5	28.0	M8

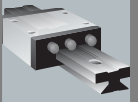
TW-01-20 HKA, Lly for a guide carriage with manual clamping and floating bearing in y-direction. Floating offers 1mm extra clearance

This order example (TK-01-15-2-500 HKA) corresponds to a DryLin® T system of size 15 with 2 carriages, 500 mm rail length and manual clamping.

[illegible]

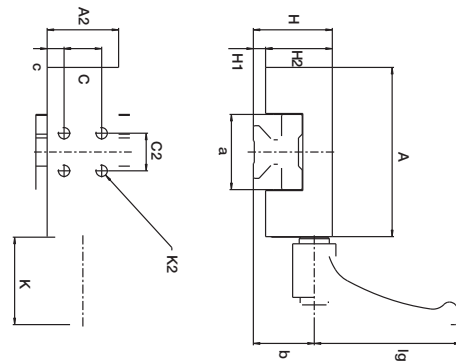
Manual clamping
Length of rail (mm)
Number of carriages
Size
Type
Complete set

DryLin® T Linear Guide Systems Clamping Elements and Manual Clamp



Special properties

- Compact clamping of high loads, for all sizes (15-30) holding strength 112 lbs
- Simple assembly



DryLin® T carriages with manual clamping

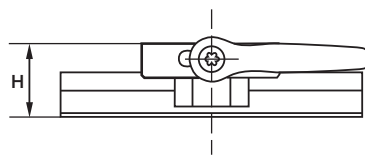
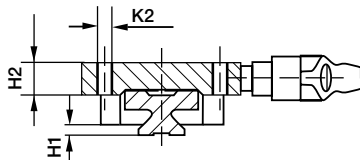
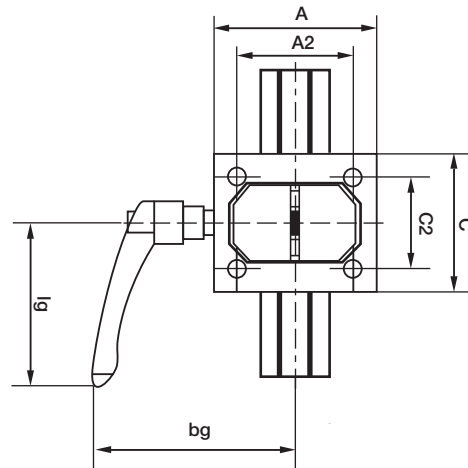
Part No.	A	a	A2	H	H1	H2	K2	C	C2	c	lg	b
TWBM-11-15	47	22	15	24	4	20	M4	15	15	4	44	18.9
TWBM-11-20	63	31	28	30	6	24	M5	15	15	6.5	44	23
TWBM-11-25	70	34	35	36	5	31	M6	20	20	7.5	63.6	26.2
TWBM-11-30	90	40	38	42	6.5	35.5	M6	20	20	9	78	32.4

DryLin® T manual clamp



Special properties

- Clamping of high loads, holding strength 112 lbf per clamp
- Brass clamp elements
- Same hole pattern as TW-01-25
- Removable handle



DryLin® T manual clamping

Part No.	A [mm]	A2 [mm]	H [mm]	H1 [mm]	H2 [mm]	K2	C [mm]	C2 [mm]	lg [mm]	bg [mm]
TWBM-01-25*	80	57	36	5	16	M8	68	45	80	99

*Only for guide rails TS-01-25

DryLin® T guide rail for TWBM

Part No.	Weight [kg/m]	L max. [mm]	a -0.2 [mm]	C4 [mm]	C5 min. max. [mm] [mm]	C6 min. max. [mm] [mm]	h	h1	K1 for Screw DIN 912	b [mm]	ly [mm²]	lz [mm²]	Wby [mm²]	Wbz [mm²]
TS-01-15	0.6	4,000	15	60	20 49	20 49	15.5	10.0	M4	22	6,440	4,290	585	488
TS-01-20	1.0	4,000	20	60	20 49	20 49	19.0	12.3	M5	31	22,570	11,520	1,456	1,067
TS-01-25	1.3	4,000	23	60	20 49	20 49	21.5	13.8	M6	34	34,700	19,300	2,041	1,608
TS-01-30	1.9	4,000	28	80	20 49	20 49	26.0	15.8	M8	40	70,040	40,780	3,502	2,832

For rails without mounting holes, please use part number suffix "S"

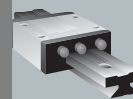
DryLin® T Linear
Guide Systems

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS

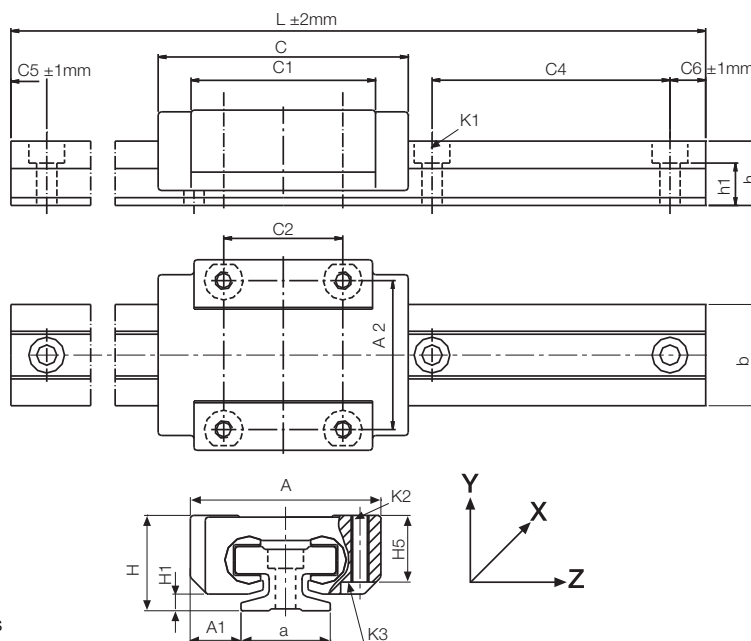




DryLin® T Linear Guide Systems - Miniature



- Maintenance-free, dry operation
- 3 sizes
- Cast zinc chromated carriage
- iglide® J polymer sliding pads
- Hard anodized aluminum rails
- Small mounting height and width
- Resistant to corrosion
- Standard bore pattern symmetrical C5 = C6
- No charge for rails cut to standard C5/C6 tolerances



DryLin® T miniature rails

Part No.	Weight [kg/m]	L max. [mm]	a -0.2 [mm]	C4 [mm]	C5 min. max. [mm] [mm]		C6 min. max. [mm] [mm]		h	h1	K1 for Screw DIN 912	b [mm]	ly [mm²]	lz [mm²]	Wby [mm²]	Wbz [mm²]
TS-04-09	0.11	2000	9	20	5	14.5	5	14.5	6.3	4.6	M 2	9.6	252	169	52	49
TS-04-12	0.19	2000	12	25	5	19.5	5	19.5	8.6	5.9	M 3	13	856	574	132	120
TS-04-15	0.33	3000	15	40	10	29.5	10	29.5	10.8	7.0	M 3	17	2420	1410	285	239

DryLin® T miniature carriages

Part No.	Weight [g]	H ±0.2 [mm]	A ±0.2 [mm]	C ±0.3 [mm]	A1 ±0.35 [mm]	A2 [mm]	C1 [mm]	C2 [mm]	H1 ±0.35 [mm]	H5 [mm]	K2 Thread	Torque Max. [Nm]	K3 for Screw DIN 912
TW-04-09	17	10	20	29	5.5	15	18	13	1.7	7.2	M 2	25	(M 2)
TW-04-12	34	13	27	34	7.5	20	22	15	2.2	9.5	M 3	50	M2 (M 3)
TW-04-15	61	16	32	42	8.5	25	31	20	2.8	11	M 3	50	M2 (M 3)

Available from stock

Structure – part no.

TK	-04	-15	-2	-500
----	-----	-----	----	------

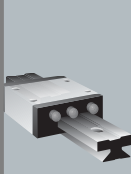
Length of rail (mm)
Number of carriages
Size
Type
Complete set

This order example (TK-04-15-2-500) corresponds to a complete DryLin® T miniature system of size 15 with 2 carriages 500 mm rail length. Order TK-04-15-2-500-LLY for a complete system with floating bearing in y-direction.

DryLin® T Linear Guide Systems

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS

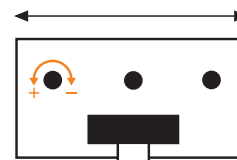




Adjusting the clearance: DryLin® T

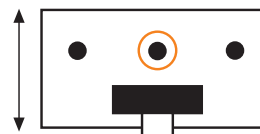
DryLin® T is delivered ready for installation. Clearance of the carriage is adjusted at the factory. The preadjustment is determined by the acting forces on each individual system. If necessary, clearance of the DryLin® T linear guide system can be readjusted. This should always take place when there is no load on the carriage.

- 1** After removing the protective cover, loosen the locknuts Width across flats:
 - SW 5 for TW-01-15 and TW-01-20
 - SW 7 for TW-01-25 and TW-01-30
- 2** Adjust the bearing clearance for the 3 guide points with an Allen key – Allen key size:
 - 1.5 mm for TW-01-15 and TW-01-20
 - 2.0 mm for TW-01-25 and TW-01-30
- 3** Check the clearance of the carriage after adjusting the 3 levels. If it is sufficient, tighten the locknuts and put on the cover.
- 4** There is a danger that excessive reduction of the clearances can seize the sliding pads and that the clearance cannot be reset simply by loosening the adjustment screws. The sliding pads are then released by pressing the reset button on the opposite side. Press hard against the readjusting spring. You must have already loosened the respective adjustment screws. Use the correct size pin for this purpose:
 - 2.5 mm for TW-01-20 and TW-01-15
 - 3.0 mm for TW-01-25 and TW-01-30



lateral guide:

– less clearance
+ more clearance



vertical guide left



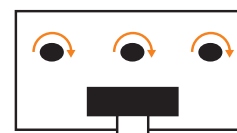
vertical guide right

Video instructions available at www.igus.com

Adjusting the clearance: DryLin® T Automatic

The DryLin® T Automatic series offers you an automatic adjustment of the clearance. A readjustment can take place automatically in steps of 0.1 mm. Springs tighten the regulating wedge immediately as soon as the clearance is bigger than 0.1 mm and the system is unloaded.

- 1** The system will be delivered with 3 keys which are already installed, and are necessary for mounting the carriage onto the rail. In case these keys are removed they need to be refitted into the openings and turned clockwise 90°.
- 2** After the carriage is on the rail, remove the keys by turning them anticlockwise 90° and pull out. The clearance will then be adjusted automatically.
- 3** You can remove the carriage at any time. In order to do so, simply plug the keys back into the carriage (see step 1).

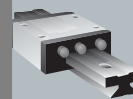


locked



unlocked

DryLin® T Linear Guide Systems System Design



Example of DryLin® T Calculation

For the exact calculation of the Linear Guide System it is essential to find out whether the position of the forces is within the allowable limits, and if the gliding element where the highest forces occur is not overloaded. The calculation of the necessary driving force and the maximum speed allowed is important. Each mounting version requires a different formula for calculation. Factors concerning shocks and acceleration forces are not included in the calculation, therefore the maximum load and allowable load must be monitored.

Variables in the Calculation:

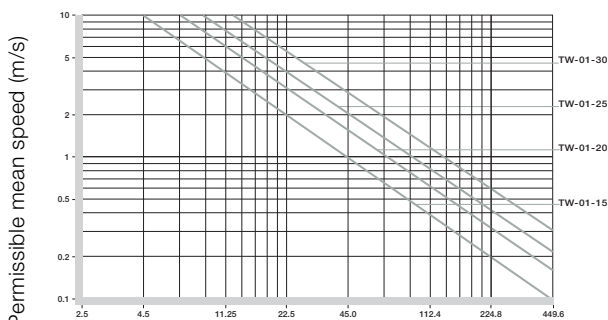
Fa	: Drive Force (lbs)
Fs	: Applied Mass Force (lbs)
Fy, Fz	: Bearing Load (lbs) in y or z direction (mm)
sx, sy, sz	: Distance of the mass force in y or z direction (mm)
ay, az	: Distance of the drive force in y or z direction (mm)
wx	: Distance between carriages on a rail (mm)
LX	: Constant from table (mm)
Zm	: Constant from table (mm)
Y0	: Constant from table (mm)
b	: Distance between guide rails (mm)
μ	: Coefficient of Friction, μ = 0 for static Loads μ = 0.2 for dynamic loads
ZW	: number of carriages per rail

Coefficients:

	1 Rail 1 Carriage	1 Rail 2 Carriages	2 Rails 3-4 Carriages
K₁	$(ay+Y0)/Lx$	$(ay+Y0)/Wx$	$(ay+Y0)/Wx$
K₂	$(sy+Y0)/Lx$	$(sy+Y0)/Wx$	$(sy+Y0)/Wx$
K₃	az/Lx	az/Wx	az/Wx
K₄	sx/Lx	sx/Wx	sx/Wx
K₅	sz/Lx	sz/Wx	sz/Wx
K₆	$(sy+Y0)/Zm$	$(sy+Y0)/Zm$	$(sy+Y0)/b$
K₇	sz/Zm	sz/Zm	$(sz/b)-0.5$

The Constant Values:

Part #	LX (mm)	ZM (mm)	Y0 (mm)
TW-01-15	29	16	11.5
TW-01-20	35	23	15.0
TW-01-25	41	25	19.0
TW-01-30	49	29	21.5



Centric bearing load (N)

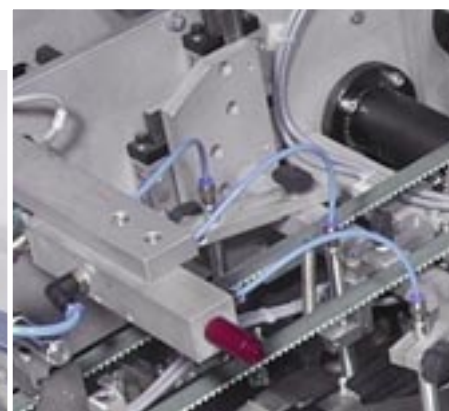
Diagram for determining the maximum permissible speed for the calculated bearing load

Part No.	Fy max. lbs	Fz max. (N)
TW-01-15	450	2000
TW-01-20	830	3700
TW-01-25	1125	5000
TW-01-30	1575	7000



Online Lifetime
Calculation
www.igus.com

Maximum permissible load



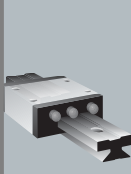
DryLin® T linear guide systems are used in these enveloping machines to guide a suction opener for envelopes. The guide system must have low clearance, be maintenance-free and not require any lubrication.



DryLin® T Linear
Guide Systems

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS





Recommended Procedure:

1st Step

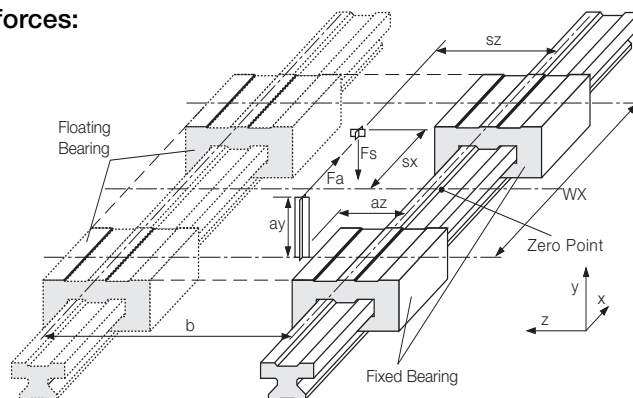
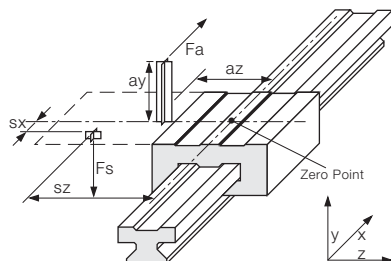
Select the mounting version:

- **horizontal**
 - 1 rail and 1 carriage
 - 1 rail and 2 carriages
 - 2 rails and 4 carriages

2nd Step

Check to see whether the maximum distances of the applied forces are within the permissible values (see Maximum permissible distances.)

Maximum permissible distances between acting forces:



Variation: 1 Rail, 1 Carriage

$s_y + s_z$	<	$2 L_x - Y_0$
$a_y + a_z$	<	$2 L_x - Y_0$
s_y	<	$5 Z_m$
s_z	<	$5 Z_m$

Variation: 1 Rail, 2 Carriages

Variation: 2 Rails, 4 Carriages

$s_y + s_z$	<	$2 w_x - Y_0$
$a_y + a_z$	<	$2 w_x - Y_0$

3rd Step:

Calculate the necessary drive force

3.1 Center of gravity in **x** and **z** direction inside the carriage(s)

$$Fa_1 = \frac{\mu}{1-2\mu K_3} \cdot F_s$$

3.2 Center of gravity in **z** direction outside of the carriage(s)

$$Fa_2 = \frac{2\mu K_7}{1-2\mu K_3} \cdot F_s$$

3.3 Center of gravity in **x** direction outside of the carriage(s)

$$Fa_3 = \frac{2\mu K_4}{1-2\mu K_3-2\mu K_1} \cdot F_s$$

If the position of the center of gravity is not specified: $F_a = \text{MAX} (Fa_1, Fa_2, Fa_3)$

4th Step:

Calculate the maximum bearing load

4.1 Maximum bearing load in the **y** direction

$$F_{y \max} = \frac{2F_s}{Z_w} \left(\frac{2K_4}{Z_w} + 0,5 \right) \cdot \left(K_7 + 0,5 \right) + \frac{2F_a K_1}{Z_w^2}$$

4.2 Maximum bearing load in the **z** direction

$$F_{z \max} = \frac{4F_a K_3}{Z_w^2}$$

5th Step:

Check calculated load for both y and z with table on page 26.15 - Maximum permissible load for $F_{y \max}$ & $F_{z \max}$. This table illustrates the maximum permissible load on a single gliding element from the DryLin® T carriage. Evaluating the maximum load on a single gliding element establishes a safety factor for the linear system.

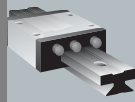
►Page 26.15

6th Step:

Determine the maximum permissible speed for the calculated load from Step No. 4

►Page 26.15

DryLin® T Linear Guide Systems - Mounting Version - Lateral



Recommended Procedure:

1st Step

Select the mounting version:

- **side-mounting**
 - 1 rail and 1 carriage
 - 1 rail and 2 carriages
 - 2 rails and 4 carriages

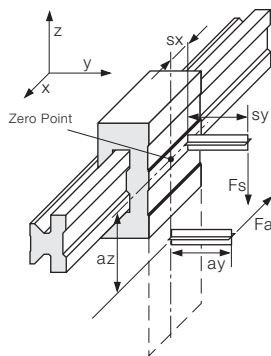


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2nd Step

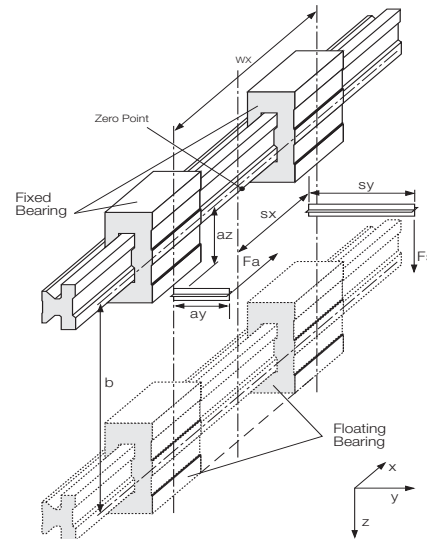
Check to see whether the maximum distances of the applied forces are within the permissible values (see Maximum permissible distances.)

Maximum permissible distances between acting forces:



Variation: 1 Rail, 1 Carriage

$s_y + s_z$	<	$2 L_x - Y_0$
$a_y + a_z$	<	$2 L_x - Y_0$
s_y	<	$5 Z_m$
s_z	<	$5 Z_m$



Variation: 1 Rail, 2 Carriages

Variation: 2 Rails, 4 Carriages

$s_y + s_z$	<	$2 w_x - Y_0$
$a_y + a_z$	<	$2 w_x - Y_0$

3rd Step:

Calculate the necessary drive force

First, two calculations must be made:

$$Fa1 = \frac{(1 + 2K_6)\mu}{1 - 2\mu K_1} \cdot F_s \quad Fa2 = \frac{(2K_4 + 2K_6)\mu}{1 - 2\mu K_1 - 2\mu K_3} \cdot F_s$$

The drive force F_a corresponds to the calculated maximum value $F_a = \text{MAX}(Fa1, Fa2)$

4th Step:

Calculate the maximum bearing load

4.1 Maximum bearing load in the y direction

$$F_{y \max} = \frac{F_s K_6}{Z_w} + \frac{2F_a K_1}{Z_w^2}$$

4.2 Maximum bearing load in the z direction

$$F_{z \max} = \frac{2F_s}{Z_w} \left(\frac{2K_4}{Z_w} + 0.5 \right) + \frac{4F_a K_3}{Z_w^2}$$

5th Step:

Check calculated load for both y and z with table on page 26.15 - Maximum permissible load for $F_{y \max}$ & $F_{z \max}$. This table illustrates the maximum permissible load on a single gliding element from the DryLin® T carriage. Evaluating the maximum load on a single gliding element establishes a safety factor for the linear system.

►Page 26.15

6th Step:

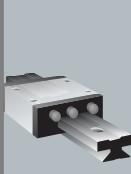
Determine the maximum permissible speed for the calculated load from Step No. 4

►Page 26.15

DryLin® T Linear
Guide Systems

PDF: www.igus.com/iglide-pdfs
CAD: www.igus.com/iglide-CAD
RoHS info: www.igus.com/RoHS





Recommended Procedure:

1st Step

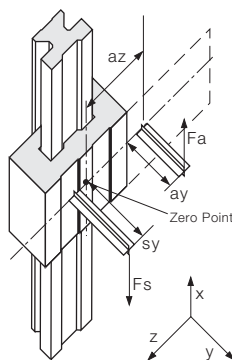
Select the mounting version:

- **vertical**
 - 1 rail and 1 carriage
 - 1 rail and 2 carriages
 - 2 rails and 4 carriages

2nd Step

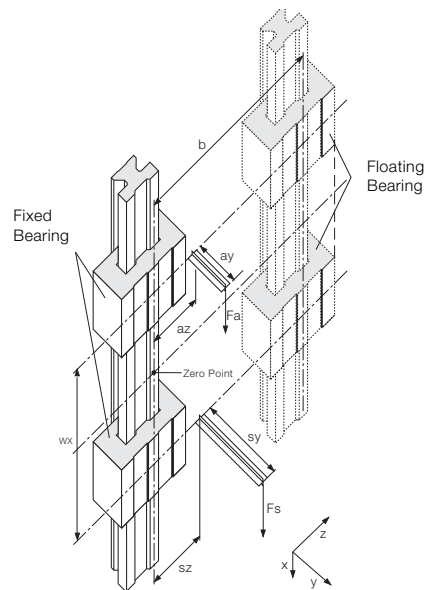
Check to see whether the maximum distances of the applied forces are within the permissible values (see Maximum permissible distances.)

Maximum permissible distances between acting forces:



Variation: 1 Rail, 1 Carriage

$s_y + s_z$	$<$	$2 L_x - Y_0$
$a_y + a_z$	$<$	$2 L_x - Y_0$
s_y	$<$	$5 Z_m$
s_z	$<$	$5 Z_m$



Variation: 1 Rail, 2 Carriages

Variation: 2 Rails, 4 Carriages

$s_y + s_z$	$<$	$2 w_x - Y_0$
$a_y + a_z$	$<$	$2 w_x - Y_0$

3rd Step:

Calculate the necessary drive force

First, four calculations must be made:

$$Fa1 = \frac{2\mu (s_z + s_y + Y_0) - w_x}{2\mu (a_z + a_y + Y_0) - w_x} \cdot F_s$$

$$Fa3 = \frac{2\mu (s_z - s_y - Y_0) - w_x}{2\mu (a_z - a_y - Y_0) - w_x} \cdot F_s$$

$$Fa2 = \frac{2\mu (-s_z + s_y + Y_0) - w_x}{2\mu (-a_z + a_y + Y_0) - w_x} \cdot F_s$$

$$Fa4 = \frac{2\mu (s_z + s_y + Y_0) + w_x}{2\mu (a_z + a_y + Y_0) + w_x} \cdot F_s$$

The drive force F_a corresponds to the calculated maximum value $F_a = \text{MAX} (Fa1, Fa2, Fa3, Fa4)$

4th Step:

Calculate the maximum bearing load

4.1 Maximum bearing load in the y direction

$$F_{y \max} = \left| F_a \frac{a_y + Y_0}{w_x} - F_s K_2 \right| \cdot \frac{2}{Z_w^2}$$

4.2 Maximum bearing load in the z direction

$$F_{z \max} = \left| F_a \frac{a_z}{w_x} - F_s K_5 \right| \cdot \frac{4}{Z_w^2}$$

5th Step:

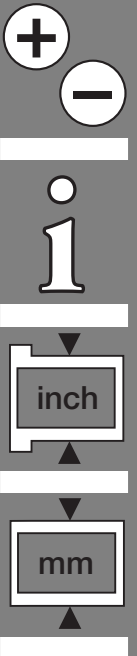
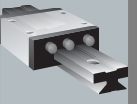
Check calculated load for both y and z with table on page 26.15 - Maximum permissible load for $F_{y \max}$ & $F_{z \max}$. This table illustrates the maximum permissible load on a single gliding element from the DryLin® T carriage. Evaluating the maximum load on a single gliding element establishes a safety factor for the linear system.

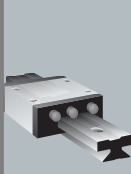
►Page 26.15

6th Step:

Determine the maximum permissible speed for the calculated load from Step No. 4

►Page 26.15





DryLin® W Linear Guide Systems

DryLin® W Linear
Guide Systems

Telephone 1-800-521-2747
Fax 1-401-438-7270

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email: sales@igus.com
QuickSpec: <http://www.igus.com/iglide-quickspec>