



PBC Linear Guides

Product Overview

- Ceramic coated aluminum guide track with anodized aluminum carriage
- Guide tracks & Carriages made of 6061-T6 AL
- Self-lubricating FrelonGOLD® Plain Bearing bonded to carriage
- Smooth & quiet operation
- Vibration damping & shock resistant
- No lubricant required
- Maintenance free bearing surface
- Carriage Static Load Rating up to 8,200 N (1,843 lbf)
- Operates within a wide temperature range -400°F to 400°F (-240°C to 204°C)
- Available Lengths up to 2000mm
- 7 available Sizes

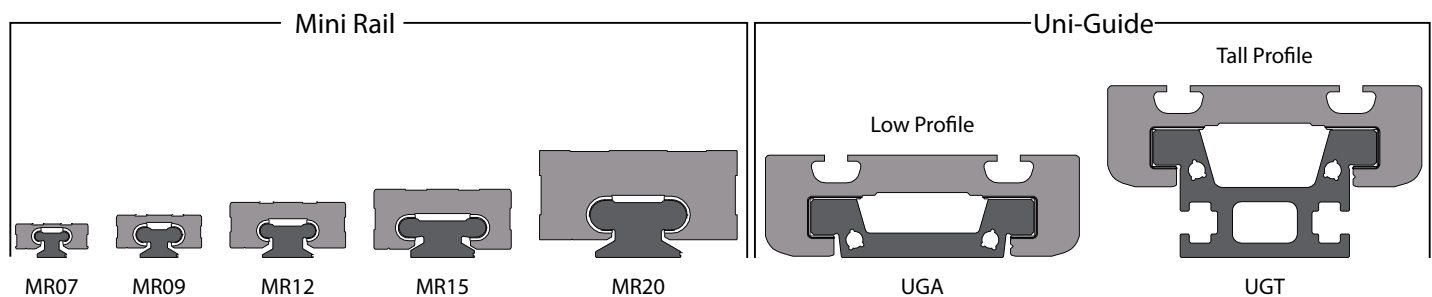
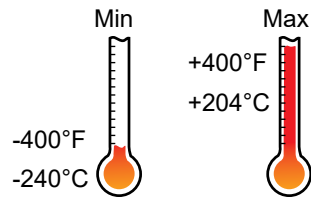
Designed to provide smooth, maintenance-free linear motion in various demanding applications!



Applications

- Contaminated environments
- Clean rooms
- Washdown & submerged conditions
- Medical Device Assembly
- Packaging
- Food Processing
- Printing
- Electronics assembly

Temperature Extremes



Parts are shown in relative scale



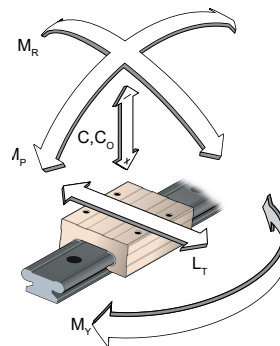
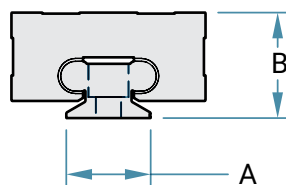
Features & Benefits

- Carriage included with guide track
- Compact design with a small footprint
- Guide track Material: 6061-T6 Aluminum with ceramic coating
- Carriage Material: 6061-T6 Aluminum with anodized finish
- Bearing Material: FrelonGold®
- FrelonGold Coefficient of Friction = 0.125
- Running Clearance = 0.025 - 0.051mm
- Available in five sizes: 7, 9, 12, 15, and 20 mm
- Available in lengths up to 500 mm



MR07-0100-1

Mini-Rail Specifications												
Part Number	Price	Series Size (A)	Overall Height (B)	Guide track Length	Frelon Effective Area	Load Ratings						Drawing Links
						N			N-m			
						Static (Co)	Reverse Static (-Co)	Lateral (Lt)	Pitch Moment (MP)	Yaw Moment (My)	Roll Moment (MR)	
MR07-0100-1	\$47.00	7 mm	8 mm	100 mm	0.14 in ²	445	89	133	1.8	2.3	1.8	PDF
MR07-0150-1	\$53.00			150 mm								PDF
MR09-0100-1	\$48.00	9 mm	10 mm	100 mm	0.267 in ²	667	125	222	3.2	5	3.2	PDF
MR09-0150-1	\$51.00			150 mm								PDF
MR12-0100-1	\$49.00	12 mm	13 mm	100 mm	0.288 in ²	1334	222	400	5.6	9	5.6	PDF
MR12-0150-1	\$56.00			150 mm								PDF
MR12-0200-1	\$62.00			200 mm								PDF
MR15-0150-1	\$58.00	15 mm	16 mm	150 mm	0.47 in ²	2224	356	667	9	15.1	9	PDF
MR15-0300-1	\$77.00			300 mm								PDF
MR15-0400-1	\$91.00			400 mm								PDF
MR20-0250-1	\$83.00	20 mm	25 mm	250 mm	1.069 in ²	3559	578	1112	14.7	24.9	14.7	PDF
MR20-0400-1	\$105.00			400 mm								PDF
MR20-0500-1	\$119.00			500 mm								PDF



Prior to use, it is best to clean the guide track with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in.



Uni-Guides™

Features & Benefits

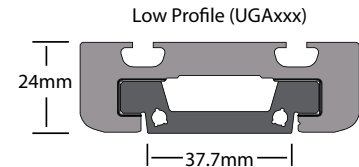
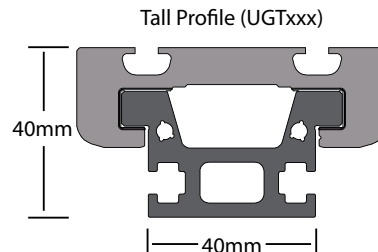
- Carriage included with guide track in either Low or Tall profile version
- Temperature range +/- 400°F (+/- 240°C)
- Guide track Material: 6061-T6 Aluminum with ceramic coating
- Carriage Material: 6061-T6 Aluminum with anodized finish
- Bearing Material: FrelonGold®
- FrelonGold Coefficient of Friction = 0.125
- Running Clearance = 0.064 - 0.089mm
- Lengths up to 2000 mm
- Tall and low profiles available



UGT040-0400-0C1G00-1



UGA040-0400-0C1G00-1



Uni-Guide Specifications

Part Number	Price	Profile	Guide track Length	Frelon Effective Area	Load Ratings						Drawing Links
					N			N·m			
					Static (Co)	Reverse Static (-Co)	Lateral (Lt)	Pitch Moment (MP)	Yaw Moment (My)	Roll Moment (MR)	
UGA040-0400-0C1G00-1	\$143.00	Low*	400 mm	0.93 in ²	8200	2700	4900	170	170	120	PDF
UGA040-1000-0C1G00-1	\$229.00		1000 mm								PDF
UGA040-1500-0C1G00-1	\$301.00		1500 mm								PDF
UGA040-2000-0C1G00-1	\$373.00		2000 mm								PDF
UGT040-0400-0C1G00-1	\$144.00	Tall**	400 mm								PDF
UGT040-1000-0C1G00-1	\$239.00		1000 mm								PDF
UGT040-1500-0C1G00-1	\$318.00		1500 mm								PDF
UGT040-2000-0C1G00-1	\$397.00		2000 mm								PDF

*Low profile (UGA) Uni-Guides can be mounted using M6 or 1/4-20 screws in the center of the Guide Track. See Drawing Link above for more details.

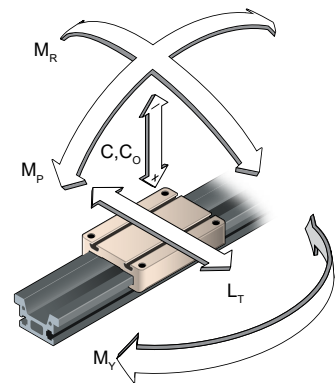
**Tall profile (UGT) Uni-Guides require a minimum of four (4) mounting clamps.

Uni-Guide Mounting Clamps

Part Number	Price	Description	Drawing Links
UGT040A-TC-1	\$3.50	PBC mounting clamp, 1 hole. For use with PBC UGT040-xxxx guide tracks.	PDF
UGT040A-TC-2	\$6.50	PBC mounting clamp, 2 holes. For use with PBC UGT040-xxxx guide tracks.	PDF



UGT040A-TC-1



Prior to use, it is best to clean the guide track with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in.

What is FrelonGOLD?

FrelonGOLD is a compound of Polyterafluoroethylene (PTFE) and fillers developed for improved performance over other bearings. They provide low wear, low friction, self-lubrication, and high strength.



Transfer Process of Liner to Shaft

The interaction of the Frelon® material and the shafting creates a natural, microscopic transfer of the Frelon to the running surface. A thin film is deposited on the shaft, and the valleys in the surface finish are filled in with Frelon material during the initial break-in period. This transfer creates the self-lubricating condition of Frelon riding on Frelon. This break-in period varies depending on several criteria:

1. Preparation of the shafting prior to installation – it is best to clean the shafting with a 3-in-1 type oil before installing the bearings. This ensures that the surface will receive a full transfer of material.
2. Speed, load, and length of stroke specific to the application – typically the initial transfer process will take approximately 50-100 strokes of continuous operation. The running clearance on the bearing will increase an average of 0.0002" to 0.0005", depending on the length of the stroke and surface requiring the transfer.
3. How often the shafting is cleaned – if the shafting is cleaned regularly, increased wear will be seen in the bearings. This is due to the transfer process being performed over and over again.

Performance Ratings (for Linear Motion)

Plain bearings are rated by their limiting Pressure Velocity (PV), which is a combination of load over a given surface area and the velocity.

(-)C₀ = Static Load on bearing

A = Bearing effective surface area

V = velocity (speed) in ft/min (m/min.)

P = Pressure on Bearing = C₀/A

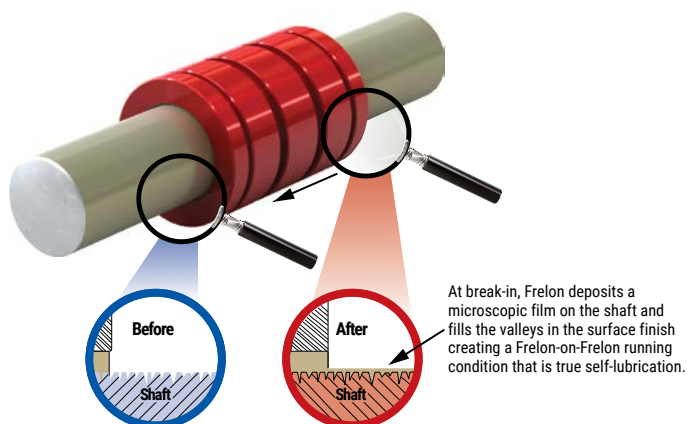
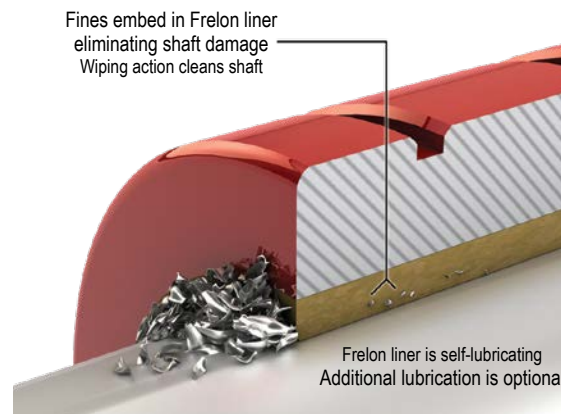
PV = Pressure Velocity

PV _{max}	P _{max}	V _{max}		
		No Lube Continuous Motion	No Lube Intermittent Motion	With Lubrication*
20000 (psi x ft./min.)	3000 psi	300 ft/min	825 ft/min	825 ft/min
430 (kgf/cm ² x m/min.)	210.9 kgf/cm ²	1.524 m/sec.	4.19 m/sec.	4.19 m/sec.

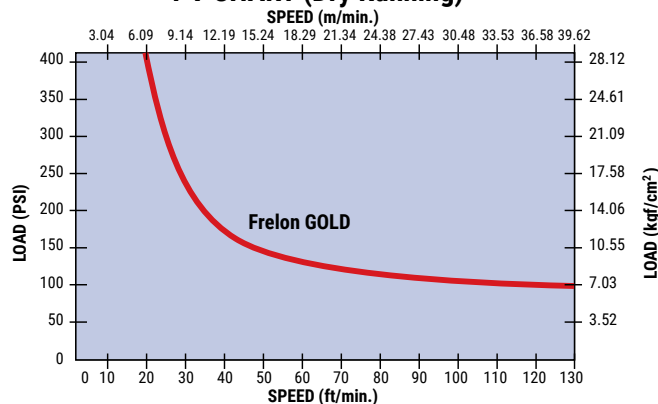
*Depending on the lubrication used, loads, and frequency of continuous or intermittent motion, speeds can be in excess of the numbers shown.



FrelonGOLD not recommended for use with deionized water and other harsh chemicals. See the chemical reaction chart



PV CHART (Dry Running)



Recommended Lubricants:

- Waylube oil
- Light weight oils
- Petroleum based grease
- 3-in-1 oils

Not Recommended Lubricants:

- WD-40
- PTFE sprays
- Fluorocarbons
- Silicon oils

Prior to use, it is best to clean the rail with a 3-in-1 type oil before installing the carriages. This ensures that the surface will receive a full transfer of Frelon material during break-in



Chemical Reaction Chart for Simplicity® Bearings

The FrelonGOLD® material is a composite of PTFE and a bearing filler. The PTFE is chemically inert. The chemical resistance shown in the chart below is defined by the compatibility of the filler with the various chemicals.

Other data in the chart below applies to the bearing shell and pillow block materials. The table is provided as a reference only. The data given will be affected by factors such as temperature, PV, degree of contact, strength of solution, etc. In each specific application, it is always advisable to conduct specific testing to determine suitability of use. This table only addresses general corrosion, NOT galvanic, SCC, or other types of corrosion. Corrosion rates are at room temperature unless otherwise noted.

Standard and hard coat data only apply when the coating is intact. If the coating is worn through or damaged, an area of galvanic and pitting corrosion will be created. Then use the bare aluminum data.

Standard Simplicity products use aluminum alloy, which is known to have the best corrosion resistance of the high strength aluminum alloys. The sulfuric bath anodizing and nickel acetate sealing provide the best corrosion resistance available in anodized coatings. They can withstand a rigorous 14-day exposure in a 5% salt spray solution at 96°F per military specifications without significant damage. With the coating intact, it is considered to be inert in most fluids with a pH value between 5 and 8. Hard coat anodizing provides the same chemical resistance but is applied to a 0.002" thickness, providing a more durable surface that will stand up to greater abuse. However, if the coating is penetrated, the resistance is reduced.

Special stainless steel bearings use AISI 316 stainless, which has superior resistance over 303, 304, 420, 440, 17-4PH, and most other common stainless grades. 316 is generally considered to be the most corrosion resistant of conventional stainless steels.



This information was compiled for Pacific Bearing® Company by Materials Engineering, Inc. of Virgil, IL. This specification information is believed to be accurate and reliable, however, no liability is assumed. Information is for reference only. User must test specific applications.

Performance	Wear
E = Excellent	< 0.002" per year
G = Good	< 0.020" per year
S = Satisfactory	< 0.050" per year
U = Unsatisfactory	> 0.040" per year

Chemical	Frelon GOLD	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	316 Stainless Steel
Acetic Acid, 20%	U	G	G	E
Acetone	G	E	E	E
Ammonia, Anhydrous	G	E	E	E
Ammonium Hydroxide, 10%	U	U	U	E
Ammonium Chloride, 10%	U	U	U	G
Ammyl Acetate (122°F / 50°C)	G	E	E	E
Barium Hydroxide	U	U	U	G
Beer	G	E	E	E
Boric Acid Solutions	G	E	E	G
Butane	G	G	G	G
Calcium Chloride, 20%	G	G	G	G
Calcium Hydroxide, 10%	G	G	G	G
Carbon Dioxide	G	E	E	G
Carbon Monoxide	G	E	E	E
Chlorine Gas, Dry	G	G	G	G
Chlorine Gas, Wet	U	U	U	U
Chromic Acid, 10%	U	G	E	E
Citric Acid, 5%	G	E	E	E
Ethyl Acetate	G	E	E	G
Ethyl Alcohol	G	E	E	G
Ethylene Glycol	G	E	E	G
Ferric Chloride, 50%	U	U	U	U
Formic Acid - Anhydrous	U	E	E	E
Gasoline, Unleaded	G	G	G	G
Hydrochloric Acid, 20%	U	U	U	U
Hydrochloric Acid, 35%	U	U	U	U
Hydrocyanic Acid, 10%	U	G	G	G
Hydrofluoric Acid - Dilute	U	U	U	U
Hydrofluoric Acid, 48%	U	U	U	U
Hydrogen	G	E	E	E
Hydrogen Peroxide - Dilute	U	E	E	G

Chemical	Frelon GOLD	Bare Aluminum	Standard & Hard Coat Anodized Aluminum	316 Stainless Steel
Hydrogen Sulfide, Dry	U	G	E	E
JP-4	G	G	G	G
Kerosene	G	G	G	G
Lactic Acid, 10%	G	G	G	E
Magnesium Chloride, 50%	G	U	U	G
Mercury	U	U	U	E
Methyl Alcohol	G	G	G	G
Methyl Ethyl Ketone	G	G	G	G
Methylene Chloride	G	E	E	G
Mineral Oil	G	G	G	G
Naptha	G	G	G	G
Nitric Acid, 70%	U	U	U	E
Phosphoric Acid, 10%	U	U	U	E
Sodium Chloride	G	U	U	E
Sodium Hydroxide, 20%	G	U	U	G
Sodium Hypochlorite, 20%	U	G	G	U
Sodium Peroxide, 10%	U	G	G	G
Steam (see water)	-	-	-	-
Sulfur Dioxide, Wet	U	U	U	G
Sulfur Dioxide, Dry	G	G	G	G
Sulfur Trioxide	U	G	G	G
Sulfuric Acid, 50%	U	U	U	U
Sulfurous Acid	U	G	G	E
Toluene (122°F / 50°C)	G	E	E	E
Turpentine	G	G	E	E
Water, Demineralized	U	G	E	E
Water, Distilled	G	U	S	G
Sea Water	G	G	E	G
Water, Sewage	G	U	S	G
Xylene	G	G	G	G
Zinc Chloride Solutions	U	U	U	G