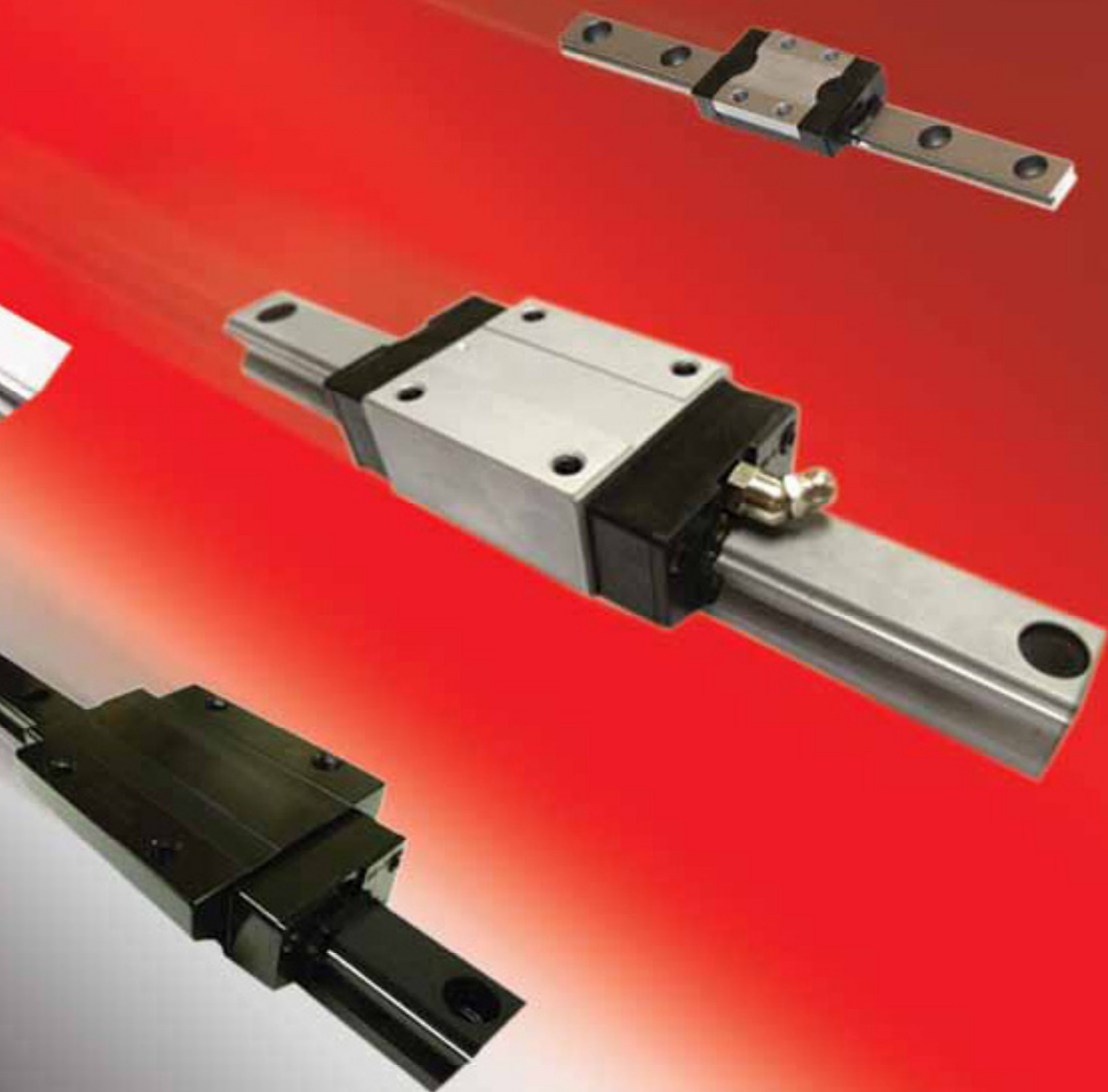


DriveLines 

Power Transmission Solutions



BallLinearRange 

ORDERING INFORMATION

Features of Ball Linear Guides:

- Internal lubrication for longer life - (C)
- Size interchangeable with competing brands
- Available with wash down, FDA approved Armoloy and chemi black coating

CARRIAGE

BR - X - XX - XX - XX - XX - X - X

C: Standard End Caps
(with lubricators)

D: Short End Caps
(no lubricators)
Size 35 & 45

SIZE

15
20
25
30
35
45

CARRIAGE TYPE

A0: with flange, standard height
R0: without flange, standard height
LA: long with flange, standard height
LR: long without flange, standard height
UO: without flange, low height
SU: short without flange, low height

PRECISION

N: Normal
H: High
P: Precision
SP: Super
UP: Ultra

PRELOAD

ZF: Clearance
Z0: None (standard)
Z1: Light
Z2: Medium
Z3:

ACCESSORIES

Blank: End seals standard
B: Metal scrapers
C: Top & side seals, metal scrapers
T: Oil tank, one end
U: Oil tank, both ends

COATING

Blank: no coating
ALY: Armoloy coating
BL: chemi black

NOTES: 1. Size 15,20,25 and 30 carriages are provided standard with an internal lubrication part for extended life.

RAIL

BR - XX - R - X - XXX - XXXX - X

SIZE

15
20
25
30
35
45

PRECISION

N: Normal
H: High
P: Precision
SP: Super
UP: Ultra

COATING

Blank: no coating
ALY: Armoloy coating
BL: chemi black

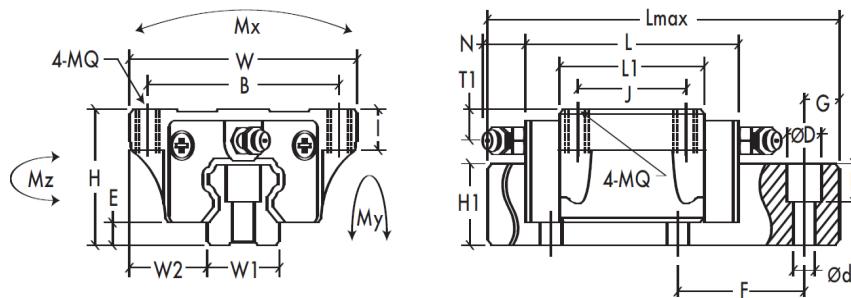
LENGTH

Up to 4000mm

ACCESSORIES

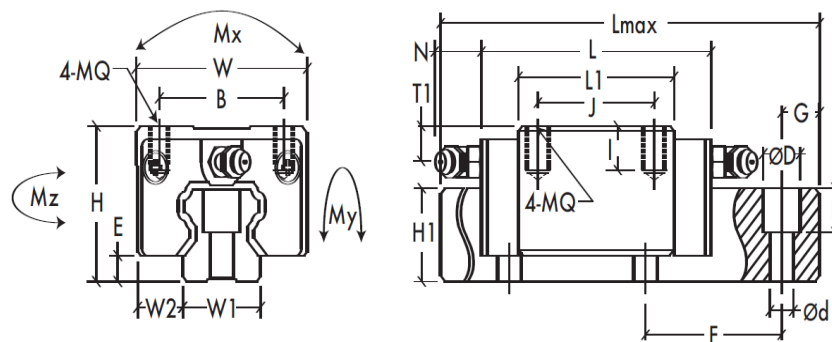
C: Stainless steel cover strip (Supplied in 50m roll)

STANDARD HEIGHT WITH FLANGE (BR-X-XX-A0 & LA)



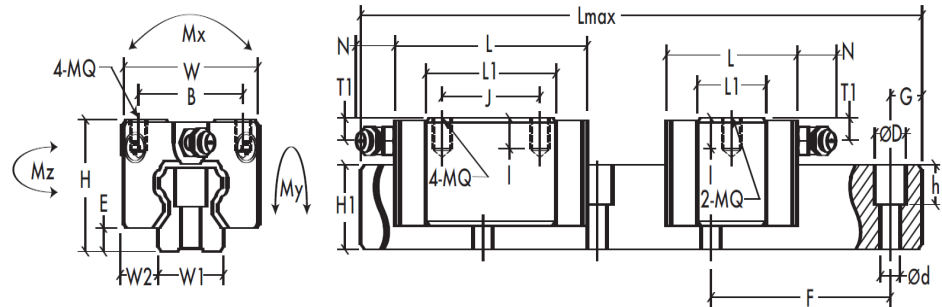
| Part No | Assembly (mm) | | | | Carriage (mm) | | | | | | | | Rail (mm) | | | | | Basic Load Rating (kg-f) | | Static Moment (kg-f* m) | | | Weight | |
|----------------------|---------------|-----|------|-----|---------------|--------|---------|--------------|----------|-----|-----|----|-----------|-----|-----------------|------|------|--------------------------|----------------|-------------------------|------------|------------|-----------------|---------------|
| | H | W | W2 | E | L | B x J | MQ x I | L1 | Oil Hole | T1 | N | W1 | H1 | F | d x D x h | Lmax | G | C | Co | Mx | My | Mz | Carriage (kg-f) | Rail (kg-f/m) |
| BRC15-A0 | 24 | 47 | 16 | 4.6 | 66 | 38x30 | M5 x8 | 40 | Ø3 | 4.3 | 5 | 15 | 14 | 60 | 4.5 x 7.5 x 5.3 | 4000 | 20 | 850 | 1650 | 10 | 8 | 8 | 0.21 | 1.4 |
| BRC20-A0 | 30 | 63 | 21.5 | 5 | 77.8 92.4 | 53x40 | M6 x9 | 48.8 63.4 | M6x1 | 5 | 6.5 | 20 | 18 | 60 | 6 x 9.5 x 8.5 | 4000 | 20 | 1450 | 2560 | 22 | 18 | 18 | 0.4 | 2.6 |
| BRC20-LA | | | | | | | | | | | | | | | | | | 1900 | 3330 | 28.6 | 23.4 | 23.4 | 0.52 | |
| BRC25-A0 BRC25-LA | 36 | 70 | 23.5 | 7 | 88 110.1 | 57x45 | M8 x12 | 57 79.1 | M6x1 | 5 | 6.5 | 23 | 22 | 60 | 7 x 11 x 9 | 4000 | 20 | 2140 2996 | 4000 5600 | 36 50.4 | 32 44.8 | 31 43.4 | 0.57 0.72 | 3.6 |
| BRC30-A0 BRC30-LA | 42 | 90 | 31 | 9 | 109 131.3 | 72x52 | M10 x12 | 72 94.3 | M6x1 | 7 | 6.5 | 28 | 26 | 80 | 9 x 14 x 12 | 4000 | 20 | 2980 3900 | 5490 7190 | 60 78.5 | 50 65 | 49 65 | 1.1 1.4 | 5.2 |
| BRD35-A0 BRD35-LA | 48 | 100 | 33 | 9.5 | 109 134.8 | 82x62 | M10 x13 | 80 105.8 | M6x1 | 8 | 6.5 | 34 | 29 | 80 | 9 x 14 x 12 | 4000 | 20 | 3960 5230 | 7010 9270 | 96 125 | 75 95 | 73 95 | 1.6 2 | 7.2 |
| BRD45-A0 BRD45-LA | 60 | 120 | 37.5 | 14 | 138.2 163 | 100x80 | M12 x15 | 105 129.8 | M8x1 | 10 | 13 | 45 | 38 | 105 | 14 x 20 x 17 | 4000 | 22.5 | 6740 8330 | 12100 14950 | 216 267 | 170 210 | 168 210 | 2.7 3.6 | 12.3 |

STANDARD HEIGHT WITHOUT FLANGE (BR-X-XX-R0 & LR)



| Part No | Assembly (mm) | | | | Carriage (mm) | | | | | | | | Rail (mm) | | | | | Basic Load Rating (kg-f) | | Static Moment (kg-f* m) | | | Weight | |
|----------------------|---------------|----|------|-----|---------------|----------------|----------|--------------|----------|------|-----|----|-----------|-----|-----------------|------|------|--------------------------|----------------|-------------------------|------------|------------|-----------------|---------------|
| | H | W | W2 | E | L | B x J | MQ x I | L1 | Oil Hole | T1 | N | W1 | H1 | F | d x D x h | Lmax | G | C | Co | Mx | My | Mz | Carriage (kg-f) | Rail (kg-f/m) |
| BRC15-R0 | 28 | 34 | 9.5 | 4.6 | 66 | 26x26 | M4 x6.4 | 40 | Ø3 | 8.3 | 5 | 15 | 14 | 60 | 4.5 x 7.5 x 5.3 | 4000 | 20 | 850 | 1650 | 10 | 8 | 8 | 0.19 | 1.4 |
| BRC20-R0 | 30 | 44 | 12 | 5 | 77.8 92.4 | 32x36 32x50 | M5 x8 | 48.8 63.4 | M6x1 | 7 | 6.5 | 20 | 18 | 60 | 6 x 9.5 x 8.5 | 4000 | 20 | 1450 | 2560 | 22 | 18 | 18 | 0.31 | 2.6 |
| BRC20-LR | | | | | | | | | | | | | | | | | | 1900 | 3330 | 28.6 | 23.4 | 23.4 | 0.47 | |
| BRC25-R0 BRC25-LR | 40 | 48 | 12.5 | 7 | 88 110.1 | 35x35 35x35 | M6 x9.6 | 57 79.1 | M6x1 | 11.8 | 6.5 | 23 | 22 | 60 | 7 x 11 x 9 | 4000 | 20 | 2140 2996 | 4000 5600 | 36 50.4 | 32 44.8 | 31 43.4 | 0.45 0.56 | 3.6 |
| BRC30R0 BRC30LR | 45 | 60 | 16 | 9 | 109 131.3 | 40x40 40x40 | M8 x12.8 | 72 94.3 | M6x1 | 10 | 6.5 | 28 | 26 | 80 | 9 x 14 x 12 | 4000 | 20 | 2980 3900 | 5490 7190 | 60 78.5 | 50 65 | 49 65 | 0.91 1.2 | 5.2 |
| BRD35-R0 BRD35-LR | 55 | 70 | 18 | 9.5 | 109 134.8 | 50x50 50x72 | M8 x12.8 | 80 105.8 | M6x1 | 15 | 6.5 | 34 | 29 | 80 | 9 x 14 x 12 | 4000 | 20 | 3960 5230 | 7010 9270 | 96 125 | 75 95 | 73 95 | 1.5 1.9 | 7.2 |
| BRD45-R0 BRD45-LR | 70 | 86 | 20.5 | 14 | 138.2 163 | 60x60 60x80 | M10 x16 | 105 129.8 | M8x1 | 18 | 13 | 45 | 38 | 105 | 14 x 20 x 17 | 4000 | 22.5 | 6740 8330 | 12100 14950 | 216 267 | 170 210 | 168 210 | 2.3 2.8 | 12.3 |

LOW ASSEMBLY, WITHOUT FLANGE (BR-X-XX-U0 & SU)



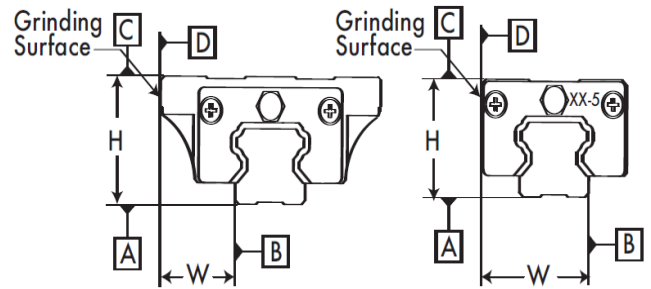
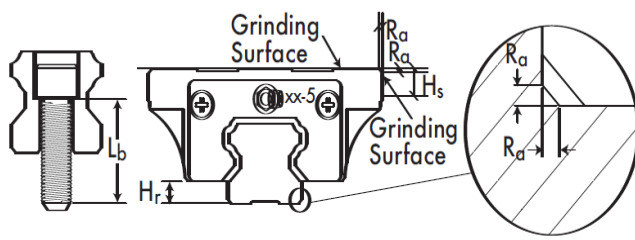
| Part No | Assembly (mm) | | | | Carriage (mm) | | | | | | | Rail (mm) | | | | | | Basic Load Rating (kg-f) | | Static Moment (kg-f* m) | | | Weight | |
|----------------------|---------------|----|------|-----|---------------|---------------|---------|------------|----------|-----|-----|-----------|----|-----|-------------|------|------|--------------------------|--------------|-------------------------|------------|------------|-----------------|---------------|
| | H | W | W2 | E | L | B x J | MQ x I | L1 | Oil Hole | T1 | N | W1 | H1 | F | d x D x h | Lmax | G | C | Co | Mx | My | Mz | Carriage (kg-f) | Rail (kg-f/m) |
| BRC15-U0 BRC15-SU | 24 | 34 | 9.5 | 4.6 | 66 47.6 | 26x26 26x- | M4x5.6 | 40 21.6 | 3 | 4.3 | 5 | 15 | 14 | 60 | 4.5x7.5x5.3 | 4000 | 20 | 850 510 | 1650 950 | 10 6 | 8 4.8 | 8 4.5 | 0.17 0.1 | 1.4 |
| BRC20-U0 BRC20-SU | 28 | 42 | 11 | 5 | 77.8 57 | 32x32 32x- | M5x7 | 48.8 28 | M6x1 | 5 | 6.5 | 20 | 18 | 60 | 6x9.5x8.5 | 4000 | 20 | 1450 830 | 2560 1470 | 22 12.6 | 18 10.3 | 18 10.3 | 0.26 0.17 | 2.6 |
| BRC25-U0 BRC25-SU | 33 | 48 | 12.5 | 7 | 88 62.5 | 35x35 35x- | M6x8.4 | 57 31.5 | M6x1 | 4.8 | 6.5 | 23 | 22 | 60 | 7x11x9 | 4000 | 20 | 2140 1190 | 4000 2230 | 36 20 | 32 17.5 | 31 17.2 | 0.38 0.21 | 3.6 |
| BRC30-U0 BRC30-SU | 42 | 60 | 16 | 9 | 109 75.6 | 40x40 40x- | M8x11.2 | 72 38.6 | M6x1 | 7 | 6.5 | 28 | 26 | 80 | 9x14x12 | 4000 | 20 | 2980 1595 | 5490 2940 | 60 32 | 50 27 | 49 27 | 0.81 0.48 | 5.2 |
| BRD35-U0 BRD35-SU | 48 | 70 | 18 | 9.5 | 109 74.7 | 50x60 50x- | M8x11.2 | 80 45.7 | M6x1 | 8 | 6.5 | 34 | 29 | 80 | 9x14x12 | 4000 | 20 | 3690 2260 | 7010 4000 | 96 54.5 | 75 42.5 | 73 41.5 | 1.2 0.8 | 7.2 |
| BRD45-U0 | 60 | 86 | 20.5 | 14 | 138.2 | 60x60 | M10x14 | 108 | M8x1 | 8.5 | 13 | 45 | 38 | 105 | 14x20x17 | 4000 | 22.5 | 6740 | 12100 | 216 | 170 | 168 | 2.1 | 12.3 |

NEW PART NUMBERS

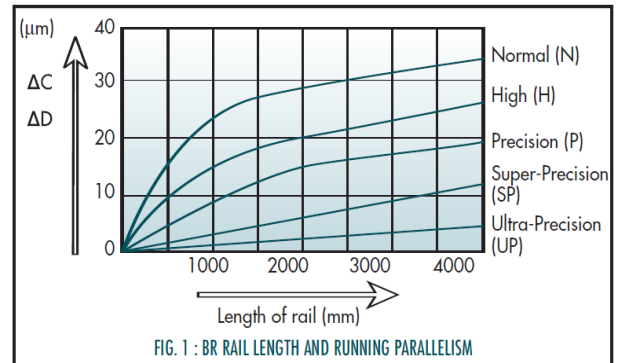
| | Old Part Number | New Part Number |
|-------------|-----------------|-----------------|
| BR15 | BRH15A | BRC15-A0 |
| | BRH15B | BRC15-R0 |
| | BRS15B | BRC15-U0 |
| | BRS15BS | BRC15-SU |
| BR20 | BRH20A | BRC20-A0 |
| | BRH20AL | BRC20-LA |
| | BRH20B | BRC20-R0 |
| | BRH20BL | BRC20-LR |
| | BRS20B | BRC20-U0 |
| | BRS20BS | BRC20-SU |
| BR25 | BRH25A | BRC25-A0 |
| | BRH25AL | BRC25-LA |
| | BRH25B | BRC25-R0 |
| | BRH25BL | BRC25-LR |
| | BRS25B | BRC25-U0 |
| | BRS25BS | BRC25-SU |

| | Old Part Number | New Part Number |
|-------------|-----------------|-----------------|
| BR30 | BRH30A | BRC30-A0 |
| | BRH30AL | BRC30-LA |
| | BRH30B | BRC30-R0 |
| | BRH30BL | BRC30-LR |
| | BRS30B | BRC30-U0 |
| | BRS30BS | BRC30-SU |
| BR35 | BRH35A-S | BRD35-A0 |
| | BRH35AL-S | BRD35-LA |
| | BRH35B-S | BRD35-R0 |
| | BRH35BL-S | BRD35-LR |
| | BRS35B-S | BRD35-U0 |
| | BRS35BS-S | BRD35-SU |
| BR45 | BRH45A-S | BRD45-A0 |
| | BRH45AL-S | BRD45-LA |
| | BRH45B-S | BRD45-R0 |
| | BRH45BL-S | BRD45-LR |
| | BRS45B-S | BRD45-U0 |
| | BRS45BS-S | BRD45-SU |

ASSEMBLY AND ACCURACY



| In mm Part No | Max. Fillet (Rg) | Max. Height Rail Shoulder (Hr) | Max. Height Block Shoulder (Hs) | Sugg. Rail Bolt Length (Lb) |
|---------------|------------------|--------------------------------|---------------------------------|-----------------------------|
| BR-15 | 0.8 | 4.0 | 5 | M4*16 |
| BR-20 | 0.8 | 4.5 | 6 | M5820 |
| BR-25 | 1.2 | 6.0 | 7 | M6*25 |
| BR-30 | 1.2 | 8.0 | 8 | M8*30 |
| BR-35 | 1.2 | 8.5 | 9 | M8*30 |
| BR-45 | 1.6 | 12.0 | 11 | M12*40 |
| BR-55 | 1.6 | 13.0 | 12 | M14*45 |



| In mm | Precision Class | | | | |
|---|--------------------|----------|---------------|----------------------|----------------------|
| | Normal (N) | High (H) | Precision (P) | Super Precision (SP) | Ultra Precision (UP) |
| Height tolerances (H) | ±0.1 | ±0.04 | 0/-0.04 | 0/-0.02 | 0/-0.01 |
| Tolerance of Width (W) | ±0.1 | ±0.04 | 0/-0.04 | 0/-0.02 | 0/-0.01 |
| Height differential (ΔH) | 0.03 | 0.02 | 0.01 | 0.005 | 0.003 |
| Width differential (ΔW) | 0.03 | 0.02 | 0.01 | 0.005 | 0.003 |
| Parallelism (between carriage surfaces A and C) | ΔC-refer to fig.1 | | | | |
| Parallelism (between carriage surfaces B and D) | ΔD- refer to fig.1 | | | | |

FRICIONAL RESISTANCE

The frictional resistance can be calculated with the following formula.

$$F = u * W * f$$

F = frictional resistance

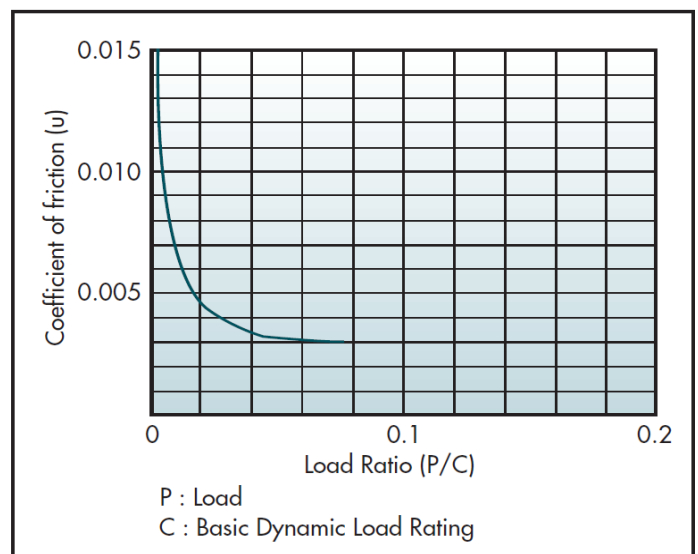
W = load

U = coefficient of friction

f = seal resistance

| Part Number | Resistance (kg-f) |
|-------------|-------------------|
| BR-15 | 0.3 |
| BR-20 | 0.4 |
| BR-25 | 0.4 |
| BR-30 | 0.5 |
| BR-35 | 0.7 |
| BR-45 | 0.9 |
| BR-55 | 1.0 |

U: COEFFICIENT OF FRICTION



NOMINAL LIFE CALCULATION : L

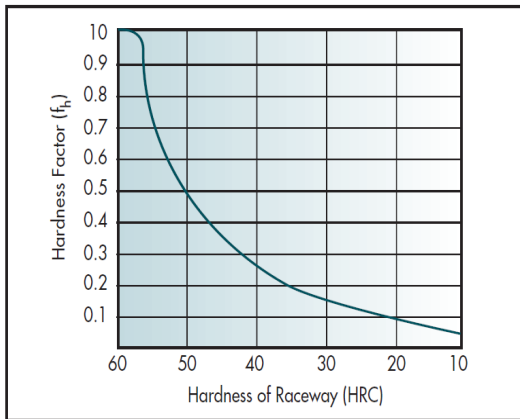
Given the basic dynamic load rating C and the applied load P, the following calculates the nominal life, L of a linear motion system using steel balls.

$$L = \left(\frac{f_h * f_t * f_c}{f_w} * \frac{C}{P} \right)^3 * 50$$

L: nominal life
 C: basic dynamic load rating
 P: applied load
 f_h: hardness factor
 f_t: temperature factor
 f_c: contact factor
 f_w: load factor

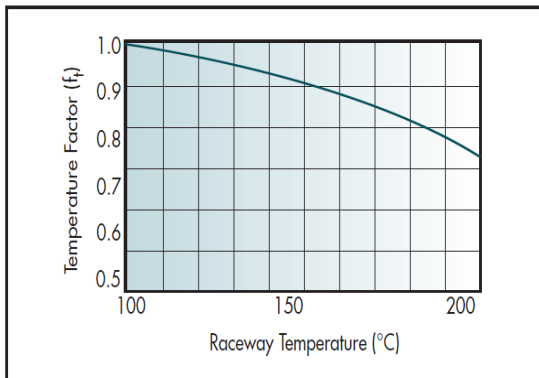
HARDNESS COEFFICIENT: f_h

The desired hardness of the rail is HRC58-64 for optimum load capacity. For a hardness under HRC58, the basic static load ratings should be multiplied by f_h.



TEMPERATURE COEFFICIENT: f_t

For temperatures over 100°C, apply the appropriate f_t.



Note 1: When used in an environment over 80°C, the seals and end plates should be designed for high temperature operation.

Note 2: When used above 120°C, thermal expansion will require further design consideration.

LOAD COEFFICIENT: f_w

| Impact and Vibration | Speed (V) | Measured Vibration (G) | f _w |
|------------------------------------|--------------------------------------|------------------------|----------------|
| No external impact or vibration | At low speed V <= 15m/min | 6 <= 0.5 | 1-1.5 |
| No significant impact or vibration | At medium speed 15 < V <= 60m/min | 0.5 < G <= 2.0 | 1.5-2.0 |
| With external impact or vibration | At high speed V > 60m/min | 1.0 < G <= 2.0 | 2.0-3.5 |

PRELOAD GRADE

| | Force |
|---------------------|--------|
| Clearance (ZF) | 0 |
| No preload (Z0) | 0 |
| Light preload (Z1) | 0.02 C |
| Middle preload (Z2) | 0.05 C |
| hEAVY PRELOAD (Z3) | 0.07 C |

Basic static load rating (C₀) is defined as a static load of constant magnitude acting in one direction under which the sum of the permanent deformations of rolling elements are raceway equals 0.0001 times the diameter of the rolling elements.

Basic dynamic load rating (C). When individual, yet identical linear motion systems are applied independently under the same conditions, the basic load rating, C is a load of constant magnitude acting in one direction that results in a nominal life of 50km.

CONTACT COEFFICIENT: f_c

Use the contact coefficient f_c when multiple carriages are applied to the same rail.

| No. of carriages on Rail | Contact Factor |
|--------------------------|----------------|
| 2 | 0.081 |
| 3 | 0.72 |
| 4 | 0.66 |
| 5 | 0.61 |
| Normal operation | 1 |

STATIC SAFETY COEFFICIENT: f_s

f_s: (f_c*C₀)/P or f_s: f_c*M₀/M

f_s: static safety coefficient

f_c: contact coefficient

C₀: basic static load rating

P: design load

M₀: permissible sink moment

M: design moment

| Operating Conditions | Load Conditions | Minimum |
|----------------------|--|---------|
| Normally stationary | Small impact and deflection | 1.0-1.3 |
| | Impact and twisting load is applied | 2.0-3.0 |
| Normally moving | Small impact or twisting load is applied | 1.0-1.5 |
| | Impact or twisting load is applied | 2.5-5.0 |

Application Advice

Contact us if you would like to discuss an application with a sales engineer or would like a site visit.

We represent the following manufacturers in the UK and Ireland:

- ADE-Werk GmbH
- Automation & Gears GmbH
- MS Graessner GmbH & Co KG
- Grob Antriebstechnik GmbH
- Heid Antriebstechnik GmbH
- IMS Gear GmbH
- LM76 Linear Motion Bearings
- R+W Antriebselemente GmbH
- USAutomation
- Wörner Automatisierungstechnik GmbH
- Zimmer Group GmbH
- ZF Maschinenantriebe GmbH



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