

### Price Index



41 Widths  
9 Bending Radii

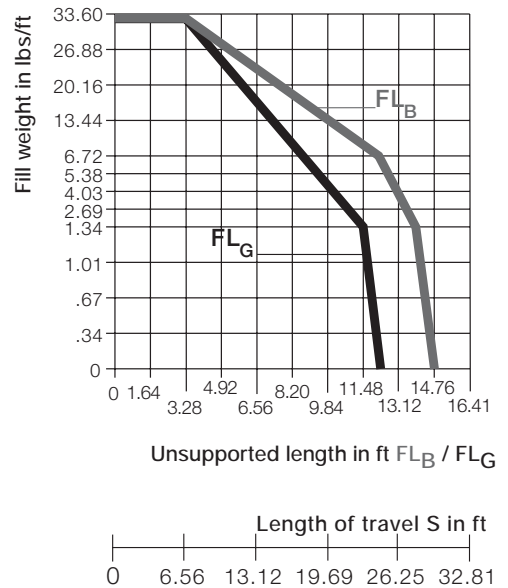
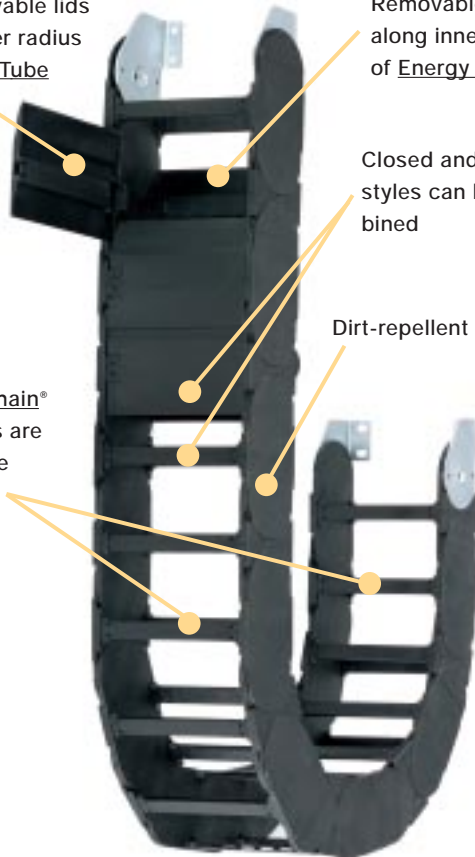
Hinged, snap-open and removable lids along outer radius of Energy Tube

Removable lids along inner radius of Energy Tube

Closed and open styles can be combined

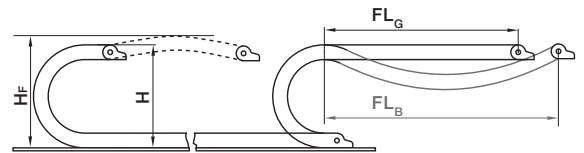
Dirt-repellent exterior

Energy Chain® crossbars are removable along both radii



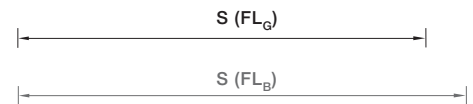
### Unsupported length

- FL<sub>B</sub> = unsupported with permitted sag
- FL<sub>G</sub> = unsupported with straight upper run



### Product range

Inner Widths (Bi) inches mm:	1.97 - 23.62 (50 - 600)
Bending Radii (R) inches mm:	7.87 (200), 9.84 (250), 11.81 (300), 13.78 (350), 15.75 (400), 17.72 (450), 19.69 (500), 21.65 (550), 23.62 (600)
Pitch:	5.63 (143 mm/link) = 2.13 links/ft (7 links/m) 39.4 (1001 mm)



Unsupported Energy Chains® ► **Design, Chapter 1**, feature positive camber over short travels. This must be accounted for when specifying the clearance height. Please refer to **Installation dimensions** for further details.

If the unsupported length is exceeded, the Energy Chain®/Tube must glide on itself. This requires a guide trough ► **Design, Chapter 1**



**When to use the Series 1640/R1608:**

- If a simpler, low-cost solutions is required
- If optimized interior space is required
- If Series 400 is over-specified



**When not to use the Series 1640/R1608:**

- If maximum stability is required  
► Series 600/ R608, Chapter 6

### Other Installation Methods:

<b>Vertical, hanging</b>	= max 328 ft (100 m)
<b>Vertical, standing, unsupported*</b>	= max 16.4 ft (5 m)
<b>Side-mounted, unsupported</b>	= max 6.56 ft (2 m)
<b>Rotary</b>	= requires further calculation

\*With support, this distance can be greater. Call igus for details.

- Long travel Max: 1476 ft. (450 m)

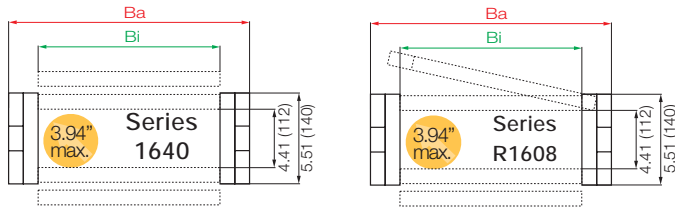
- Accessories for  
► Guide Troughs, Chapter 9
- Further information  
► Design, Chapter 1



# Series 1640/R1608 "E4/Light"



1640  
R1608



Part No.	Bi	Ba <sup>+4</sup>
1640-05	1.97 (50)	3.31 (84)
1640-06	2.56 (65)	3.90 (99)
1640-07	2.95 (75)	4.29 (109)
1640-10	3.94 (100)	5.28 (134)
1640-11	4.41 (112)	5.75 (146)
1640-12	4.92 (125)	6.26 (159)
1640-13	5.39 (137)	6.73 (171)
1640-15	5.91 (150)	7.24 (184)
1640-16	6.38 (162)	7.72 (196)
1640-17	6.89 (175)	8.23 (209)
1640-18	7.36 (187)	8.70 (221)
1640/ 1608-20	7.87 (200)	9.21 (234)
1640-21	8.35 (212)	9.69 (246)
1640-22	8.86 (225)	10.20 (259)
1640-23	9.33 (237)	10.67 (271)
1640/ 1608-25	9.84 (250)	11.18 (284)
1640-26	10.31 (262)	11.65 (296)
1640-27	10.83 (275)	12.17 (309)
1640-28	11.30 (287)	12.64 (321)
1640/ 1608-30	11.81 (300)	13.15 (334)
1640-31	12.28 (312)	13.62 (346)

Bending Radii  
for ALL Widths

7.87 (200)\*  
9.84 (250)  
11.81 (300)  
13.78 (350)  
15.75 (400)  
17.72 (450)  
19.69 (500)  
21.65 (550)  
23.62 (600)

\* Not available  
for R1608

Part No.	Bi	Ba <sup>+4</sup>
1640-32	12.80 (325)	14.13 (359)
1640-33	13.27 (337)	14.61 (371)
1640/ 1608-35	13.78 (350)	15.12 (384)
1640-36	14.25 (362)	15.59 (396)
1640-37	14.76 (375)	16.10 (409)
1640-38	15.24 (387)	16.57 (421)
1640/ 1608-40	15.75 (400)	17.09 (434)
1640-41	16.22 (412)	17.56 (446)
1640-42	16.73 (425)	18.07 (459)
1640-43	17.20 (437)	18.54 (471)
1640-45	17.72 (450)	19.06 (484)
1640-46	18.19 (462)	19.53 (496)
1640-47	18.70 (475)	20.04 (509)
1640-48	19.17 (487)	20.51 (521)
1640-50	19.69 (500)	21.02 (534)
1640-51	20.16 (512)	21.50 (546)
1640-52	20.67 (525)	22.01 (559)
1640-53	21.14 (537)	22.48 (571)
1640-55	21.65 (550)	22.99 (584)
1640-60	23.62 (600)	24.96 (634)

Supplement part number with required radius  
for example, 1640-20-200-0

**i** Extender crossbars for large diameter hoses, see following pages

● For crossbar selection please visit [www.igus.com](http://www.igus.com) and use the "E-Chain Helper"

**!** Standard  
Price Index  
●●●

## Series 1640, Energy Chain (with crossbars every link)

This design is the **standard** Energy Chain® for this size range.



Price Index  
●●●

## Series R1608, Energy Chain (fully enclosed)

Energy Tubes offer excellent cable and hose protection against dirt, debris and other contaminants, as well as hot chips. This design offers cable and hose accessibility along both radii. Lids along the entire inner radius are completely removable. Lids along the entire outer radius are single-sided, snap-open, with a hinge on the other side to keep them attached to the chain, or completely removable.



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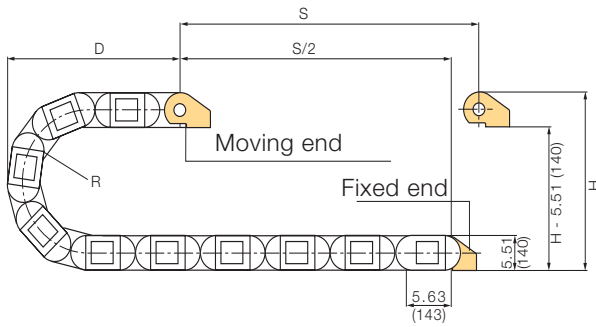
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Specs/CAD/RFO: [www.igus.com/echain.asp](http://www.igus.com/echain.asp)  
RoHS info: [www.igus.com/RoHS.asp](http://www.igus.com/RoHS.asp)



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### Installation dimensions



R	7.87 (200)	9.84 (250)	11.81 (300)	13.78 (350)	15.75 (400)
H*	21.46 (545)	25.39 (645)	29.41 (747)	33.27 (845)	37.20 (945)
D	16.34 (415)	18.31 (465)	20.27 (515)	22.24 (565)	24.21 (615)
K	36.22 (920)	42.52 (1080)	48.82 (1240)	55.12 (1400)	61.42 (1560)

R	17.72 (450)	19.69 (500)	21.65 (550)	23.62 (600)	
H*	41.14 (1045)	45.08 (1145)	49.02 (1245)	52.95 (1345)	
D	26.18 (665)	28.15 (715)	30.12 (765)	32.09 (815)	
K	67.72 (1720)	73.62 (1870)	79.53 (2020)	85.63 (2175)	

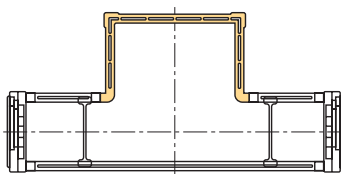
Pitch: = 5.63 (143 mm) per link  
 Links per ft (m): = 2.13 (7)  
 Total travel: = S  
 Chain length: =  $\frac{S}{2} + K$

\*The required clearance height is  $HF = H + 3.94 (100)$  with 3.36 (5 kg/m) fill weight. Please consult igus® if space is particularly restricted.

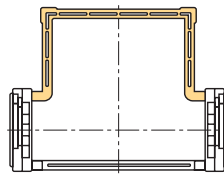
### Extender Crossbars

The extender crossbars were developed specifically for applications in which a hose or large diameter cable must be guided carefully. It is intended for hoses and cables with a maximum outer diameter of 11.81 (300 mm). The extender crossbar can be attached either along the outer or inner radius. In most applications, the inner radius is preferred. However, the chain/tube cannot glide on itself in this case. If gliding operation is required, the crossbars are assembled along the outer radius and a special guide trough is required. The extender crossbar can either be attached to the side links directly or can be used in combination with two standard snap-open crossbars.

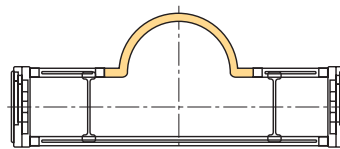
Part No.	Max Ø Hose	Style	Installation Side Link	Combined with Snap-Open Crossbars
450-15-RHD115	By request	Round	No	Yes
450-17-RD115	By request	Round	Yes	No
450-25-D150	By request	Square	Yes	No
450-30-D200	By request	Square	Yes	No
450-35-D250	By request	Square	Yes	No
450-40-D300	By request	Square	Yes	No
450-20-HD150	By request	Square	No	Yes
450-25-HD200	By request	Square	No	Yes
450-30-HD250	By request	Square	No	Yes



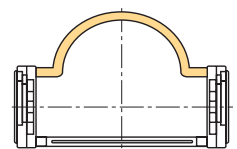
Square extender crossbar combined with standard snap-open crossbars.



Square extender crossbars attached directly to the side link.



Round extender crossbar combined with standard snap-open crossbars.



Round extender crossbar attached directly to the side link.

Consult igus® for your extender crossbar applications. We are happy to assist you with your design layout.

## Interior Separation

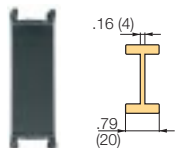
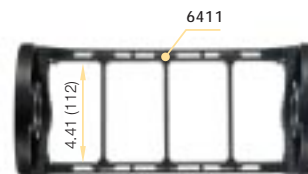
### Option 1: separators

Separators can be placed at any point along the chain's cross-section. The **standard separator (Part No. 6401)** offers safe stability due to its broad "foot" design, even when used with large diameter cables or hoses.

Separators can be used with both Energy Chains® and Energy Tubes.

A **locking separator (Part No. 6408)** with higher retention force is also available for chains only. This separator is used in applications subject to extreme loads.

All separators are adjustable, but may be fixed in place with spacers (chains only). Spacers are most often necessary with side-mounted applications.



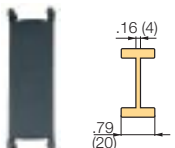
#### Separator

Unassembled	Part No. 6401
Assembled	Part No. 6411



#### Spacer (Chain Only)

Unassembled	Part No. 405-10
Assembled	Part No. 415-10



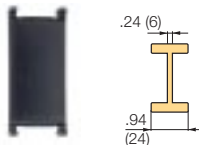
#### Locking Separator (Chain Only)

Unassembled	Part No. 6408
Assembled	Part No. 6418



#### Spacer (Chain Only)

Unassembled	Part No. 405-15
Assembled	Part No. 415-15



#### Separator (Tube Only)

Unassembled	Part No. 6001
Assembled	Part No. 6011



#### Spacer (Chain Only)

Unassembled	Part No. 405-20
Assembled	Part No. 415-20



#### Note:

The available inner height is decreased by .08 (2 mm) per spacer, (for example, if one spacer is placed on each side of a separator, the overall inner height is reduced by .16 (4 mm). In order to avoid this, place the spacers on the **outside** of the opening crossbar.



#### Spacer (Chain Only)

Unassembled	Part No. 405-30
Assembled	Part No. 415-30



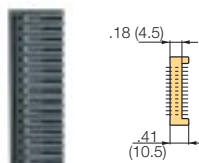
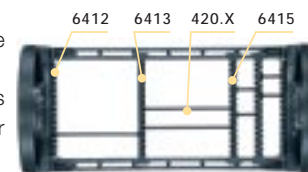
#### Spacer (Chain Only)

Unassembled	Part No. 405-40
Assembled	Part No. 415-40

### Option 2: shelves

Energy Chains® and Energy Tubes can be subdivided both vertically and horizontally using the various interior separation elements.

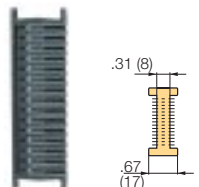
Side plates, separators and shelves form the basic pattern of a shelf system. Shelves of various widths can be arranged at 7 different heights in .28 (7 mm) increments ► **Design, Chapter 1** for layout recommendations.



#### Side Plate

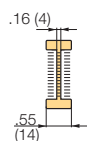
Unassembled	Part No. 6402
Assembled	Part No. 6412

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#### Vertical Separator

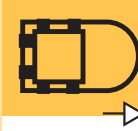
Unassembled	Part No. 6403
Assembled	Part No. 6413



#### Slotted Separators, Open

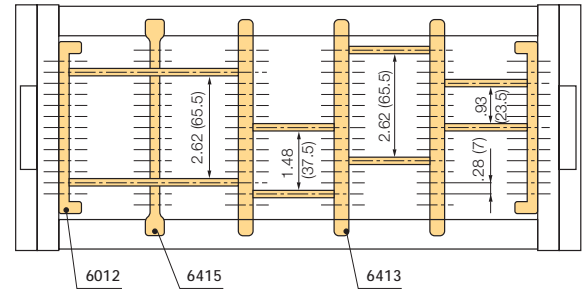
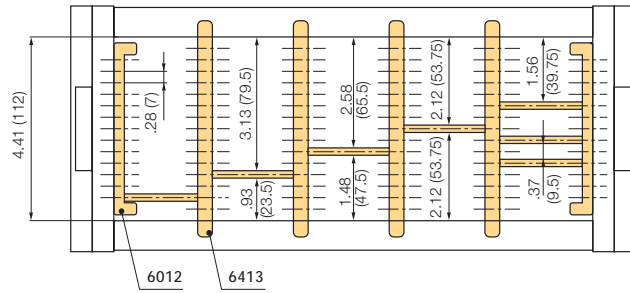
Unassembled	Part No. 6405
Assembled	Part No. 6415

PDF: [www.igus.com/echainpdf.asp](http://www.igus.com/echainpdf.asp)  
Specs/CAD/RFO: [www.igus.com/echain.asp](http://www.igus.com/echain.asp)  
RoHS info: [www.igus.com/RoHS.asp](http://www.igus.com/RoHS.asp)



## Interior Separation

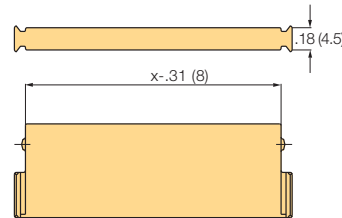
### Option 2: shelves (Continued)



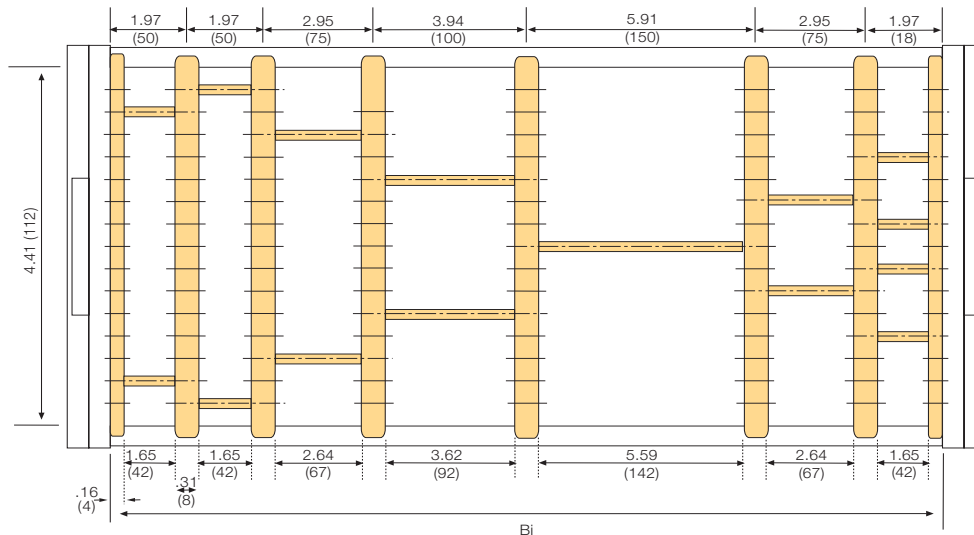
Width X	Usable Width	Part No.	Part No.
in. (mm)	in. (mm)	Unassembled	Assembled
.71 (18)	.39 (10)	420-18	421-18
.91 (23)	.59 (15)	420-23	421-23
.98 (25)	.67 (17)	420-25	421-25
1.10 (28)	.79 (20)	420-28	421-28
1.30 (33)	.98 (25)	420-33	421-33
1.69 (43)	1.38 (35)	420-43	421-43
1.97 (50)	1.65 (42)	420-50	421-50
2.44 (62)	2.12 (54)	420-62	421-62
2.95 (75)	2.64 (67)	420-75	421-75
3.94 (100)	3.62 (92)	420-100	421-100
4.92 (125)	4.61 (117)	420-125	421-125
5.91 (150)	5.59 (142)	420-150	421-150
6.89 (175)	6.57 (167)	420-175	421-175
7.36 (187)	7.04 (179)	420-187	421-187
7.87 (200)	7.56 (192)	420-200	421-200



The open, slotted separator (Part No. 6405) can be retrofitted into an existing interior separation system without removing the existing shelves as long as these shelves fit into any of the 13 middle slots.



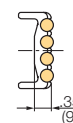
Shelves 420-XX



### Other elements for interior separation:

● Rollclip

The Rollclip has been developed to minimize abrasion of particularly sensitive hoses or cables in an Energy Chain®. The Rollclip is simply clamped onto the opening crossbar of the chain link. The integrated rollers compensate for relative movement between the chain and the hose or cable. This reduces the abrasion of the hoses or cables. Consult igus® if you have questions regarding the Rollclip.



### Rollclip

Unassembled	Part No. 488-27
Assembled	Part No. 489-27

# Series 1640/R1608 "E4/Light"

1640  
R1608

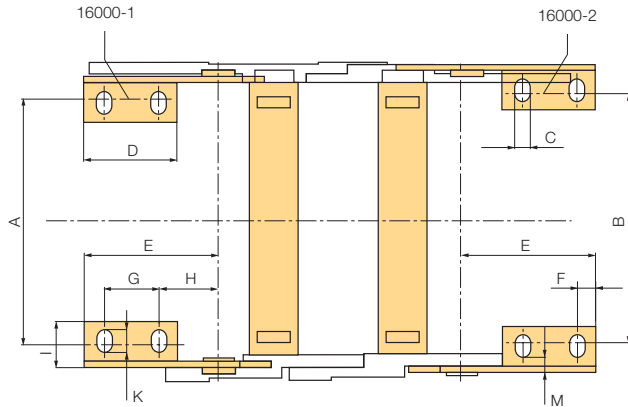
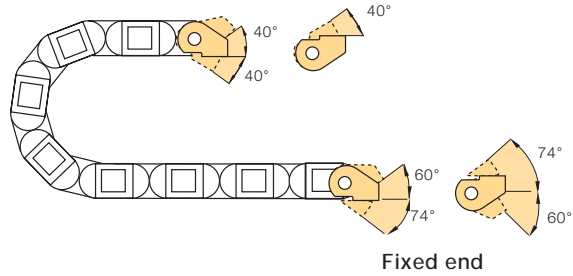
## Mounting Brackets

### Option 1: steel

- One part for all chain widths
- Electrically conductive



Moving end



16000-12 = Full set, 4 parts, 2 parts pin facing out, 2 parts pin facing in  
 16000-1 = Mounting brackets 1 part each left/right, pin facing out  
 16000-2 = Mounting brackets 1 part each left/right, pin facing in

Strain relief package  
 ► Strain Relief, Chapter 10

	A = B	C	D	E	F	G	H	I	K	M
16000-1	Bi - 1.18 (30)	.53 (13.5)	3.15 (80)	4.33 (110)	.59 (15)	1.97 (50)	1.77 (45)	1.46 (35)	.67 (17)	.47 (12)
16000-2	Bi - 1.18 (30)	.53 (13.5)	3.15 (80)	4.33 (110)	.59 (15)	1.97 (50)	1.77 (45)	1.97 (50)	.71 (22.5)	.87 (22)

## Mounting brackets

The mounting brackets **16000-12** fit all Series 1640 chains. Depending on the chain length, the carrier will end with outer or inner side links. For the best appearance, make sure the chain ends with outer side links whenever possible. An odd number of links will always end with outer side links.

Part No. 16000-1      Mounting bracket set, pin facing out  
 Part No. 16000-2      Mounting bracket set, pin facing in



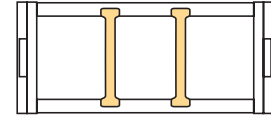
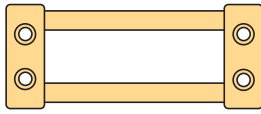
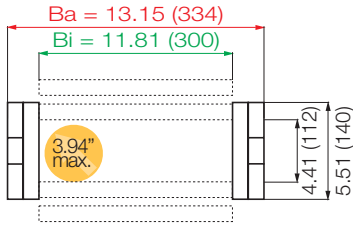
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 RoHS info: [www.igus.com/RoHS.asp](http://www.igus.com/RoHS.asp)



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Order example



1. Chain selection:

1640-30-300-0



2. Mounting brackets:

16000-12



3. Interior separation:

2 separators, assembled every other chain link (part no 6411). Alternative interior separation configuration according to design layout possible.

For 6.56 ft (2 m) chain, color black, with steel mounting brackets:

6.56 ft (2 m) 1640-30-300-0 and 16000-12, and 2 part no. 6411, assembled every other chain link



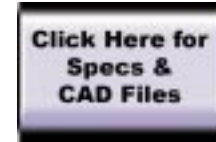
# Technical Data: Series 1640/R1608 "E4/Light"



1640  
R1608

## Technical Data

Chain/ Tube Width	Weight Per Link lbs (kg)		Weight lbs/ft (kg/m)	
	1640	R1608	1640	R1608
-12	1.746	(0.792)	3.72	(5.54)
-13	1.766	(0.804)	3.78	(5.63)
-15	1.786	(0.810)	3.81	(5.67)
-16	1.808	(0.820)	3.86	(5.74)
-17	1.830	(0.830)	3.90	(5.81)
-18	1.852	(0.840)	3.95	(5.88)
-20	1.857	(0.842)	3.96	(5.89)
-21	1.879	(0.852)	4.01	(5.96)
-22	1.892	(0.858)	4.04	(6.01)
-23	1.918	(0.870)	4.09	(6.09)
-25	1.936	(0.878)	4.13	(6.15)
-26	1.954	(0.886)	4.16	(6.20)
-27	1.976	(0.896)	4.21	(6.27)
-28	1.980	(0.898)	4.23	(6.29)
-30	2.024	(0.918)	4.32	(6.43)
-31	2.024	(0.918)	4.32	(6.43)
-32	2.042	(0.926)	4.35	(6.48)
-33	2.077	(0.942)	4.43	(6.59)
-35	2.108	(0.956)	4.50	(6.69)
-36	2.108	(0.956)	4.50	(6.69)
-37	2.112	(0.958)	4.51	(6.71)
-38	2.130	(0.966)	4.54	(6.76)
-40	2.170	(0.984)	4.63	(6.89)
-41	2.201	(0.998)	4.70	(6.99)
-42	2.231	(1.012)	4.76	(7.08)
-43	2.245	(1.018)	4.79	(7.13)
-45	2.258	(1.024)	4.82	(7.17)
-46	2.262	(1.026)	4.83	(7.18)
-47	2.289	(1.038)	4.88	(7.27)
-48	2.289	(1.038)	4.88	(7.27)
-50	2.315	(1.050)	4.94	(7.35)
-51	2.320	(1.052)	4.95	(7.36)
-52	2.328	(1.056)	4.97	(7.39)
-53	2.359	(1.070)	5.03	(7.49)
-55	2.456	(1.114)	5.24	(7.80)
-60	2.496	(1.132)	5.32	(7.92)



PDF: [www.igus.com/echainpdf.asp](http://www.igus.com/echainpdf.asp)  
 Specs/CAD/RFO: [www.igus.com/echain.asp](http://www.igus.com/echain.asp)  
 RoHS info: [www.igus.com/RoHS.asp](http://www.igus.com/RoHS.asp)

Material	igumid G
Permitted temperature	-40°/266°F (-40/+130°C)
Gliding speed (maximum)	16.4 ft/s (5 m/s)
Unsupported V (maximum)	32.8 ft/s (10 m/s)
Flammability class	VDE 0304 IIC UL94 HB

- Details of material properties
- ▶ Design, Chapter 1
- Weight data tolerance: +/- 5%



Guide Troughs

igus® Energy Chain System®

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

Internet: <http://www.igus.com>  
email: [sales@igus.com](mailto:sales@igus.com)  
QuickSpec: <http://www.igus.com/qs/echain.asp>

Width of Crossbar  
1640-12-200-0

	$B_{Ri}$	Installation Part No.
-05	3.50 (89)	*
-06	4.09 (104)	97-50-225
-07	4.49 (114)	97-50-250
-10	5.47 (139)	97-50-275
-11	5.94 (151)	97-50-275
-12	6.46 (164)	97-50-300
-13	6.93 (176)	97-50-300
-15	7.44 (189)	97-50-325
-16	7.91 (201)	97-50-325
-17	8.43 (214)	97-50-350
-18	8.90 (226)	97-50-350
-20	9.41 (239)	97-50-375
-21	9.88 (251)	97-50-375
-22	10.39 (264)	97-50-400
-23	10.87 (276)	97-50-400
-25	11.38 (289)	97-50-425
-26	11.85 (301)	97-50-425
-27	12.36 (314)	97-50-450
-28	12.83 (326)	97-50-450
-30	13.35 (339)	97-50-475
-31	13.82 (351)	97-50-475
-32	14.33 (364)	97-50-500
-33	14.80 (376)	97-50-500
-35	15.31 (389)	97-50-525
-36	15.79 (401)	97-50-525
-37	16.30 (414)	97-50-550
-38	16.77 (426)	97-50-550
-40	17.28 (439)	97-50-575
-41	17.76 (451)	97-50-575
-42	18.27 (464)	97-50-600
-43	18.74 (476)	97-50-600
-45	19.25 (489)	97-50-625
-46	19.72 (501)	97-50-625
-47	20.24 (514)	97-50-650
-48	20.71 (526)	97-50-650
-50	21.22 (539)	97-50-675
-51	21.69 (551)	97-50-675
-52	22.20 (564)	97-50-700
-53	22.68 (576)	97-50-700
-55	23.19 (589)	97-50-725
-60	25.16 (639)	97-50-775

Guide troughs are used with applications where the upper run of the Energy Chain® glides on the lower run. If using igus® steel guide troughs, the following components are required:

- Full travel length of guide trough  
**Part No. 97-30**
- 1/2 travel length glide bars  
**Part No. 93-01**
- Installation sets as end connectors  
**Part No. 97-50-XX**

-XX indicates the length of the profile rails on which the guide trough is mounted. The values and part numbers are specified in the table on the left. The standard length of the trough components and glide bars is 6.56 ft (2 m). The overall length of the guide trough directly correlates to the length of travel.

**Example:**  
Length of travel 164 ft (50 m)  
Center-mounted

**Required guide troughs:**  
164 ft (50 m) guide trough, 82 ft. (25 m) glide bar  
= 25 sections of 6.56 ft (2 m) guide trough  
**Part No. 97-30**  
= 13 sections of 6.56 ft (2 m) glide bar  
**Part No. 93-01**

**Required number of installation set:**  
= Number of guide trough components + 1  
= 25 + 1 = 26

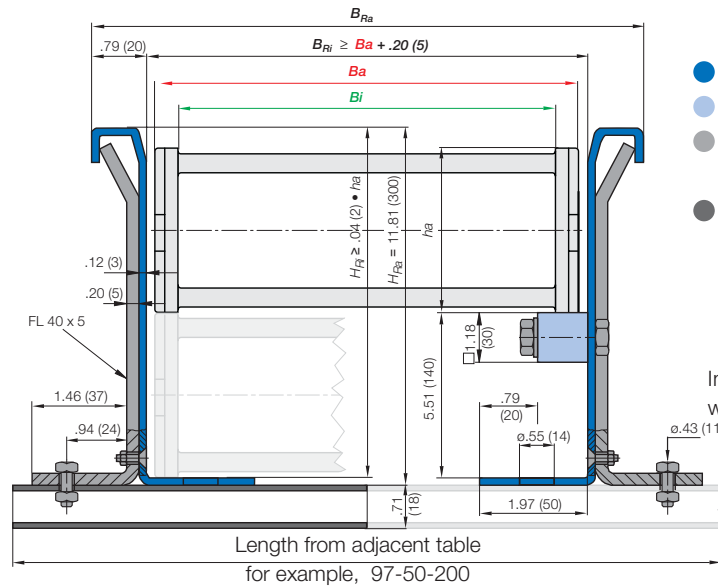
Part No. of the installation sets **97-50-XXX**  
Example:  
97-50-400 for 15.75 (400 mm) long profile rail



Left: Guide trough with glide bars  
Right: Guide troughs without glide bars



Installation sets as section connectors



- Guide trough
- Glide bars
- Installation set "Basic"
- C-profile rail

Individual attachment without profile rail

Specialized guide trough available upon request

Standard length profile rail

