

Optamid®

Deflection pulleys for elevator construction



Elevator construction



High-performance deflection pulleys for elevator construction

Architecture is constantly evolving in a variety of ways – and as superlatives grow, so do the demands placed on the building infrastructure.

Our pulleys made from the technical plastic Optamid® meet the highest demands and have worldwide been used for decades in elevator construction: in car and counterweight frames as well as tension down pulleys and pulleys for double wrapping.

Your advantages with Optamid® deflection pulleys compared with steel:

- Better handling due to lower specific weight
- Reduced energy consumption in use
- Lower noise emission
- Longer life time for pulley and rope
- Good recyclability
- Tension compensation due to EasyFlex®

Get to know our innovative solutions based on Optamid®:

Optamid® EasyFlex®

The compact Optamid® EasyFlex® deflection pulleys have been specially developed for a space-saving design and allow length tension compensation across the deflection pulleys.

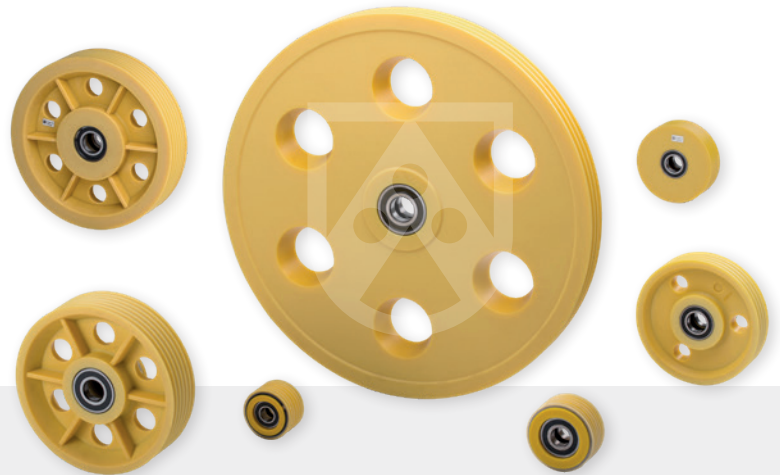
Optamid® High-Rise

The Optamid® High-Rise material offers maximum ride comfort even at high loads and speeds.

Optamid® Green Pulley

Due to its optimized and sustainable design, the Optamid® Green Pulley requires fewer resources in production and application.

TÜV compliant and certified by Liftinstituut



Pulley Express

When time is of the essence: 7-day delivery time for Optamid® pulleys

With our Pulley Express service, we ship custom-made high quality Optamid® pulleys to your specifications within the EU within 7 days.

- For this unique service, we have 25 Optamid standard design pulleys available in standard sizes with diameters from 160 to 520 mm.
- After a simple ordering process, we start the final processing of the deflection pulleys according to your requirements and send them to you by express delivery if desired.

Pulley Express Hotline:

+49 2801 76-66

E-Mail:

pulley-express-xan@roechling.com

Order form:

Scan QR code



Deflection pulleys made of casting and EasyFlex® for plastic-coated ropes

	Nominal dia D [mm]	Crown width B up to [mm]	Ø Rope [mm]		Groove (exemplary)	Bearing type
EasyFlex®	120	63	Ø 6.5	8.1	4	6307 2RS
	120	87	Ø 6.5	8.1	6	BS-2207
	160	87	Ø 6.5	8.1	6	6309 2RS
	160	111	Ø 6.5	8.1	8	6311 2RS
	240	88	Ø 6.5	8.1	6	6309 2RS
	240	136	Ø 6.5	8.1	10	6312 2RS
Deflection pulleys from multiple form (main dimensions)	120	71	Ø 6.5	8.1	3	6210 2RS
	120	79	Ø 6.5	8.1	6	BS-2208
	120	81	Ø 6.5	8.1	6	6208 2RS
	160	61	Ø 6.5	8.1	4	6008 2RS
	160	69	Ø 6.5	8.1	3	6009 2RS
	160	81	Ø 8.1	8.1	6	6210 2RS
	160	104	Ø 6.5	8.1	4/5	TBA
	160	166	Ø 6.5	8.1	7	TBA
	210	84	Ø 6.7	8.1	7	TBA
	210	114	Ø 6.7	8.1	10	6211 2RS
	240	65	Ø 6.0	8.1	6	6310 2RS
	240	83	Ø 6.0	8.1	7	6210 2RS
	240	90	Ø 6.5	8.1	8	6210 2RS
	240*	93*	Ø 6.5*	8.1	8*	6310 2RS*
	240	101	Ø 8.1	8.1	7	6210 2RS
	240*	114*	Ø 6.5*	8.1	10*	6310 2RS*
	240	130	Ø 6.0	8.1	7	6310 2RS

Listed are pulley sizes that are frequently used in the market. In addition to the dimensions in this table, pulleys can also be produced in other configurations from Ø 120 mm to 1,400 mm.

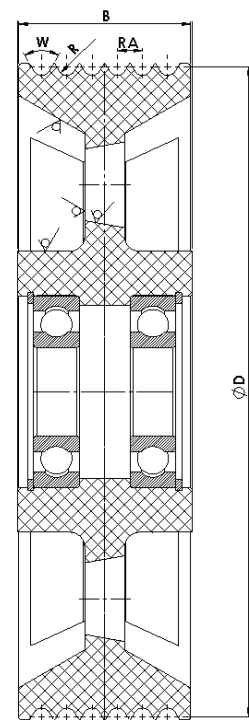
Please contact us for our questionnaire on info-xan@roebling.com.

The patented Optamid® EasyFlex® enables a tension and rope length compensation across the deflection pulleys. Rule: with traction media in general, the ropes or similar suspension should preferably have a rope tension that is as much as possible equal. Available in diameters of 240, 160, and 120 mm, the smaller EasyFlex® pulleys are an optimal solution for space-saving construction and offer further advantages such as easy installation and adjustment of small or plastic-coated wire ropes, shorter installation times, and a remarkable reduction in life cycle costs.

* available as part of the Pulley Express

	Nominal dia D [mm]	Crown width B up to [mm]	Max Ø outer bearing
Pulleys from centrifugal casting (main dimensions)	320	48	90
	320*	71*	71*
	320*	105*	105*
	320	120	130
	320*	139*	139*
	320*	173*	173*
	330	220	140
	360*	73*	73*
	360*	107*	107*
	360*	141*	141*
	360	180	140
	400	60	120
	400*	75*	75*
	400	90	130
	400*	109*	109*
	400*	143*	143*
	400*	177*	177*
	440	98	120
	440	116	120
	440	130	140
	440	160	140
	440	208	150
	520	72	125
	520*	117*	117*
	520*	151*	151*
	520*	185*	185*
	520	240	170
640	150	150	
640	210	190	
640	250	190	
640	275	190	
720	project-dependent		

The articles mentioned are based on customer specifications and are therefore not in stock. Deflection pulleys in diameters from 640 to 1,400 mm can be made in special castings.

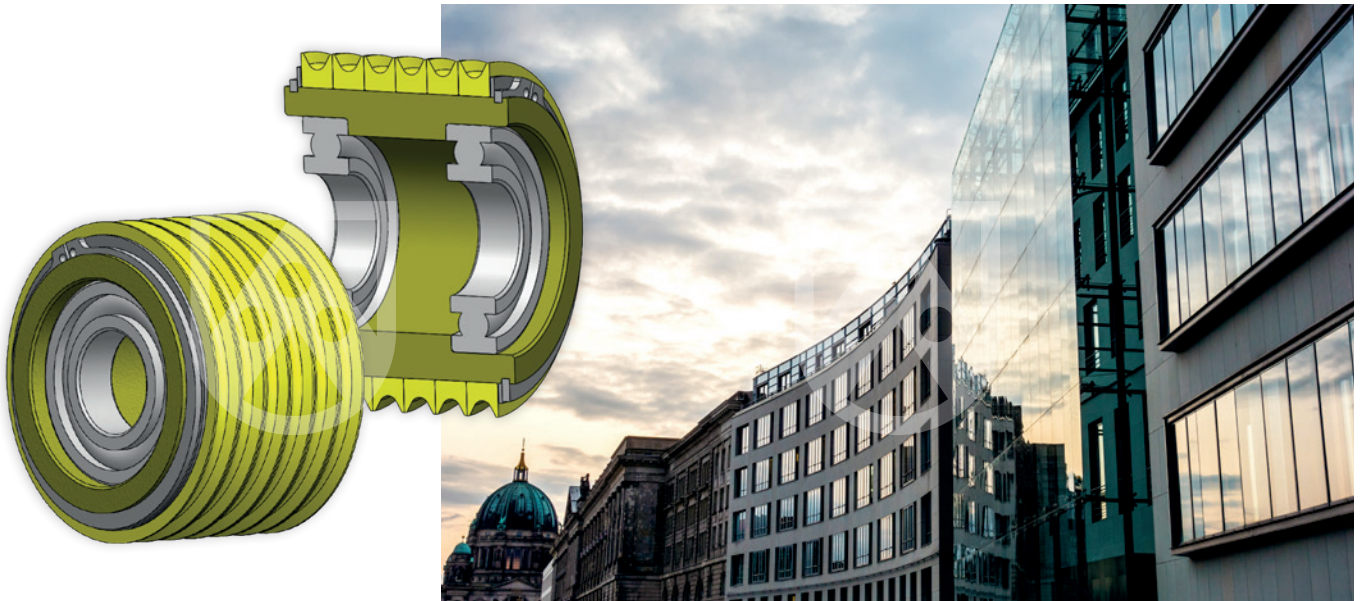


Optamid® EasyFlex®

Components of new elevators need to be space-saving to increase the shaft efficiency in new buildings, but especially in existing building structures, thus enabling the integration of new elevator solutions.

The patent-pending Optamid® EasyFlex® has been developed exactly to meet these requirements. As general rule, all ropes

or similar traction media should have most equal tension. EasyFlex® enables length and tension compensation over the deflection pulleys. Available in diameters of 240, 160, and 120 mm, the smaller EasyFlex® pulleys are **the solution for a space-saving design.**



Smart technology

On a polyamide-base body, grooved rings are mounted which can move independently. This particular construction offers a number of benefits to elevator manufacturers and owners:

- Easy and quick rope installation with multiple deflection pulleys
- Easy installation and adjustment of small or plastic-coated ropes
- Separate rings allow that each and every rope can be moved and adjusted independently
- Shorter installation times
- 2.2-fold increase in rope service life due to uniform rope tensioning
- Lower weight of an Optamid® EasyFlex® pulley compared to a steel or cast iron pulley (light weight characteristic)
- Significant reduction of life cycle costs
- Noticeable increase of elevator ride comfort

The Optamid® EasyFlex® series

Diameter Ø D [mm]	120		160		240	
Number of grooves alternative	4	6	6	8	6	10
Rope diameter [mm] alternative	6.0 – 6.5; 8.1		6.0 – 6.5; 8.1		6.0 – 6.5; 8.1	
Groove distance [mm]	12	12	12	12	12	12
Bearing type	6307 2RS	2BS-2207	6309 2RS	6311 2RS	6309 2RS	6312 2RS
Axes diameter [mm]	35	35	45	55	45	60
Width of EasyFlex® [mm]	63	87	87	111	88	136

Optamid® High-Rise

Skyscrapers rise to the sky to create living spaces between the clouds – of course, the highest floors should be accessible in the shortest possible time. The elevator systems that form the heart of such giants must therefore be safe, fast, comfortable, and durable. With speeds of up to 18 m/s, the cars have to reliably transport even heavy loads. Especially developed for these applications, the material Optamid® High-Rise meets exactly these requirements.

Aiming high – but safely and comfortably

Optamid® High-Rise is tough, quiet, and wear-resistant. The grooves of the pulleys made from durable Optamid® materials match perfectly with the steel rope surface, enables smooth running and minimizes the risk of wire breaks. Even under high loads and temperature fluctuations, the material convinces with its dimensional stability. Optamid® High-Rise absorbs vibrations and thus enables **maximum driving comfort, even at high load capacities and speeds.**



The advantages of Optamid® High-Rise at a glance

Even for compensation, double wrapping, and heavy-duty applications:

Rope speeds	up to 10 m per second
Sheave sizes	from 120 mm to 1,500 mm
Bearings	all types of bearings can be used
Driving comfort	Optamid® dimensional stability allows smooth rides at a low noise level
Lifetime	1.5 to 2.2 times longer life of pulley and ropes thanks to reduced pressure
Weight	more than 50% lighter than comparable pulleys made of cast steel

Optamid® Green Pulley

The sustainable Green Pulley surprises with its design. The slimmer design of the pulley not only reduces weight, but also meets the requirements for strength and function. The innovative ribs provide more stability and load capacity of the pulley. They also enable more uniform deformation under load, which increases ride comfort in the long term. The lubrication system has also been optimized: due to the usage of closed bearings with special grease, fewer components are used. These are also optimally prepared – for minimum maintenance with maximum grease savings. **Less material, less maintenance, minimized grease usage, and reduced energy consumption during production and operation:** all this results in an improved ecological footprint.



At a glance: The advantages of the Green Pulley

Comparison: the traditional deflection pulley and the “Green Pulley”

	Traditional deflection pulley	Optamid® Green Pulley
Weight	6.2 kg	4.6 kg
Components used, grease nipples, screws, caps	11	6
Initial lubrication	125 g, during maintenance 150 g/year	110 g, lubricated for life
Maintenance requirement	30 min./year	–
Service life	approx. 10 years	> 10 years

Less is more

The Green Pulley **saves up to 30% of material:** from raw material to production to grease (in total 1.5 kg less). In addition, the reduced relubrication requirements means less need for grease cartridges, fabrics, etc. Lighter pulleys will also result in less transport weight and a reduced fuel

consumption. In total, all these factors, in addition to increased performance for the benefit of the user, lead to a smaller and thus improved ecological footprint – a sustainable and optimized solution.

Number of possible grooves with various hub width

Ø Rope [mm]	Groove distance	Hub width [mm]					
		80	98	116	126	150	170
8	13	5	6	7	8	10	12
9	14	4	6	7	8	10	11
10	15	4	5	6	7	9	10
10.5	16	4	5	6	7	9	10
11	17	4	5	6	6	8	9
12	18	4	5	6	6	7	8
13	19	3	4	5	6	7	8
14	20	3	4	5	6	7	8
15	21	3	4	5	5	6	7
15.5	22	3	4	5	5	6	7
16	23	3	4	4	5	6	7

Minimum groove distance RA at various groove angles

Ø Rope [mm]	R	60°	45°	30°
4	2.2	8	7	6
5	2.7	9	8	7
6	3.2	10	9	8
6.5	3.5	11	10	9
8	4.2	13	12	11
9	4.8	14	13	12
10	5.3	15	14	13
11	6.0	17	16	15
12	6.5	18	17	16
13	7.0	19	18	17
14	7.5	20	19	18
15	8.5	21	20	19

Maximal possible rope pull per rope [kN]

Ø Rope [mm]	Ø Pulley						
	120	160	240	320	400	440	520
4	2.3	3.1	4.7				
5	2.9	3.9	5.9	7.8			
6	3.5	4.7	7	9.4			
6.5			7.6	10.2			
8			9.4	12.5	15.6		
10				15.6	19.5	22	
11					21.5	24.2	28
12					23.4	26.4	30.5
13						28.6	33

Permissible loads for pulleys made of Optamid®

Consideration of surface pressure in rope groove at 180° wrap angle

Would you like to provide us your data? We will gladly work out a proposal. Please contact us at info-xan@roechling.com and we will send you our questionnaire.

Shaft load calculation with 2 bearings per shaft in [kN] for L 10h = 10,000 operational hours*

Bearing type	Pulley Bearing	Axles Ø	Pulley																				
			120			160			240			320			400			440			520		
			V _R m/s **																				
			0.8	1.6	3.2	0.8	1.6	3.2	0.8	1.6	3.2	0.8	1.6	3.2	0.8	1.6	3.2	0.8	1.6	3.2	0.8	1.6	3.2
Ball bearing	6208 2RS		15	12	10	17	13	11	19	15	12	21	17	13	23	18	14						
Ball bearing	6308 2RS	40	20	16	13	22	17	14	25	20	16	28	22	17	30	24	19						
Spherical	BS2-2208-2CS		53	43	35	57	47	38	65	53	43	71	57	47	75	61	50						
Ball bearing	6210 2RS		17	14	11	19	15	12	22	17	14	24	19	15	26	21	16	27	21	17	29	23	18
Ball bearing	6310 2RS	50	31	24	19	34	27	21	39	31	24	42	34	27	46	36	29	47	37	30	50	40	31
Spherical	BS2-2210-2CS		57	46	37	62	50	41	70	57	46	76	62	50	81	66	54	84	68	55	88	71	58
Ball bearing	6211 2RS					24	19	15	27	22	17	30	24	19	33	26	20	34	27	21	36	28	22
Ball bearing	6311 2RS	55				38	31	24	44	35	28	48	38	31	52	41	33	54	43	34	57	45	36
Spherical	BS2-2211-2CS					74	60	49	84	68	55	91	74	60	98	79	64	101	82	66	106	86	70
Ball bearing	6212 2RS					29	23	18	33	26	21	36	29	23	39	31	25	40	32	25	42	34	27
Ball bearing	6312 2RS	60				44	35	28	51	40	32	56	44	35	60	48	38	62	49	39	65	52	41
Spherical	BS2-2212-2CS					93	75	61	105	85	69	114	93	75	122	99	80	125	102	83	132	107	87
Ball bearing	6213 2RS								35	28	22	38	30	24	41	33	26	43	34	27	45	36	28
Ball bearing	6313 2RS	65							58	46	36	64	51	40	69	54	43	71	56	45	75	59	47
Spherical	BS2-2213-2CS								129	105	85	141	115	93	151	123	100	155	126	102	163	133	108
Ball bearing	6214 2RS								38	30	24	42	33	26	45	36	28	46	37	29	49	39	31
Ball bearing	6314 2RS	70							66	52	42	73	58	46	78	62	49	81	64	51	85	68	54
Spherical	BS2-2214-2CS								139	113	92	152	123	100	163	132	107	167	136	110	176	143	116
Ball bearing	6215 2RS											45	36	28	49	39	31	50	40	32	53	42	33
Ball bearing	6315 2RS	75										78	62	49	84	67	53	86	69	54	91	73	58
Spherical	BS2-2215-2CS											155	126	102	166	135	109	171	138	112	179	146	118
Ball bearing	6216 2RS														51	41	32	53	42	33	56	44	35
Ball bearing	6316 2RS	80													92	73	58	94	75	60	100	79	63
Spherical	BS2-2216-2CS														184	105	122	190	154	125	200	162	132
Ball bearing	6217 2RS																	63	50	40	67	53	42
Ball bearing	6317 2RS	85																102	81	64	108	85	68
Spherical	BS2-2217-2CS																	229	186	151	241	196	159
Ball bearing	6218 2RS																				78	62	49
Ball bearing	6318 2RS	90																			116	92	73
Spherical	BS2-2218-2CS																				275	223	181
Ball bearing	6220 2RS																				98	77	61
Ball bearing	6320 2RS	100																			134	106	84
Spherical	BS2-2220-2CS																				359	292	237

* Based on dynamic load ratings from SKF ** Rope speed at the pulley; specific configurations may influence the values.

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