



Castors and wheels



Castors and wheels Catalogue

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Other Catalogues

In addition to the Castors and wheels Catalogue, the Eles+Ganter product range is available in the following catalogues:

- **General Catalogue 038**
- **New Products**
- **Tube Clamp Connectors**
- **Retaining Magnets**
- **Clamp Mountings**



PHOTOGRAPHIC INDEX

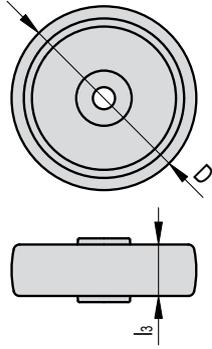
	<p>RE.FF Injected polyurethane wheels <i>Polyurethane</i></p> <p>page 6</p>		<p>NEW</p> <p>RE.F4-WEH Mould-on polyurethane wheels with electro-welded steel bracket for extra-heavy loads <i>Polyurethane</i></p> <p>page 20</p>		<p>RE.E2 Vulcanised rubber wheels <i>Rubber</i></p> <p>page 33</p>
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WHEEL/BRACKET COMBINATIONS

Injected polyurethane wheels	Mould-on polyurethane wheels	Mould-on polyurethane wheels	Monolithic wheels	Thermoplastic rubber wheels	Vulcanised rubber wheels	Vulcanised rubber wheels	Elastic rubber wheels	Mould-on polyurethane rollers
RE.FF	RE.F5	RE.F4	RE.F8	RE.G1	RE.E2	RE.E3	RE.G2	RE.G5

<p>Steel sheet bracket</p>	-N									
		RE.FF-N	RE.F5-N		RE.F8-N	RE.G1-N	RE.E2-N	RE.E3-N		
<p>Stainless steel sheet bracket</p>	-N-SST									
		RE.FF-N-SST			RE.F8-N-SST					
<p>Steel sheet bracket for medium-heavy loads</p>	-H									
			RE.F5-H	RE.F4-H	RE.F8-H			RE.G2-H		
<p>Electro-welded steel bracket for heavy loads</p>	-WH									
				RE.F4-WH	RE.F8-WH					
<p>Electro-welded steel bracket for extra-heavy loads</p>	-WEH									
				RE.F4-WEH						

TABLE OF STANDARD EXECUTIONS



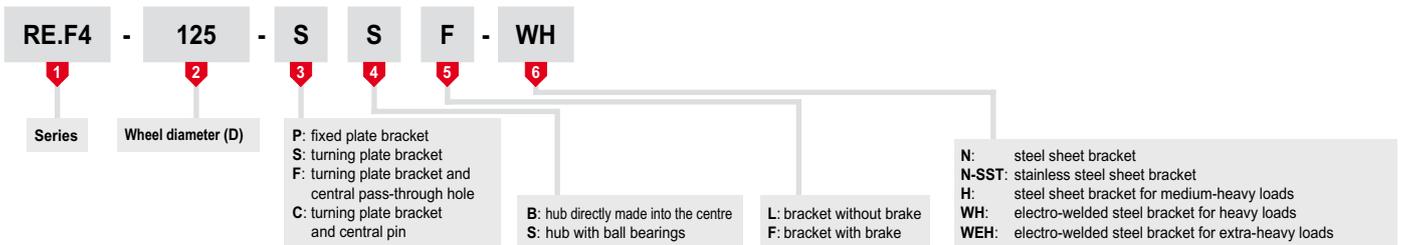
Wheel	Injected polyurethane wheels	Mould-on polyurethane wheels															
1 Series	RE.FF	RE.F5								RE.F4							
4 Hub	B	S								S							
Max dynamic carrying capacity of the wheel [N]	3500	8500								25000							

4

Castors and wheels

Bracket	Max dynamic carrying capacity of the bracket [N]	3 Type of bracket	5 Bracket with/without brake	6 Bracket Description	2 D [mm]		80		100		125		150		200		100		125		150		200		250		300				
					80	100	125	150	200	100	125	150	200	250	300	100	125	150	200	250	300										
Wheel only	-	R	L	-																											
Steel sheet bracket 	3000	P	L	N																											
		S	L																												
		S	F																												
		F	L																												
		F	F																												
Stainless steel sheet bracket 	2200	P	L	N-SST																											
		S	L																												
		S	F																												
		F	L																												
		F	F																												
Steel sheet bracket for medium-heavy loads 	7500	P	L	H																											
		S	L																												
		S	F																												
Electro-welded steel bracket for heavy loads 	9000	P	L	WH																											
		S	L																												
		S	F																												
Electro-welded steel bracket for extra-heavy loads 	23000	P	L	WEH																											
		S	L																												
		S	F																												

DESCRIPTION STRUCTURE



RE.FF

Injected polyurethane wheels

RoHS

1200 - 3500 N

Covering

Injected polyurethane, hardness 55 Shore D.

Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

Hub

Directly made into the centre.

Applications

Excellent rolling resistance and elasticity, good wear and tearing resistance. See Technical Data on page 56 for selection parameters.

Environmental conditions

Suitable for use in environments with the presence of atmospheric agents, alcohols and glycols; weak organic and mineral acids, water and saturated vapour.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

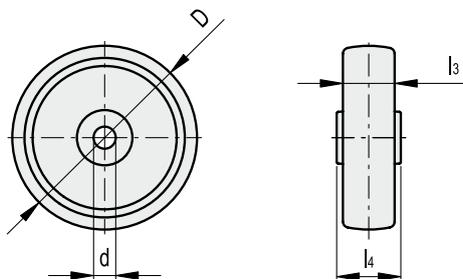
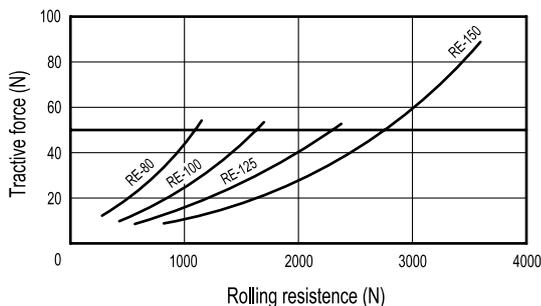
Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.FF wheels are also supplied with steel sheet brackets (RE.FF-N see page 7).



Standard Elements		Main dimensions				Static load #	Rolling resistance #	Dynamic carrying capacity #	△
Code	Description	D	d	l ₃	l ₄	[N]	[N]	[N]	g
451001	RE.FF-080-RBL	80	12	30	39	2200	1200	1200	110
451006	RE.FF-100-RBL	100	12	30	44	3000	1700	1700	150
451011	RE.FF-125-RBL	125	15	35	44	3500	2300	2300	250
451016	RE.FF-150-RBL	150	20	45	59	7000	2800	3500	470

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

Injected polyurethane wheels with steel sheet bracket

RoHS

1200 - 3000 N

• Covering

Injected polyurethane, hardness 55 Shore D.

• Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

• Hub

Directly made into the centre.

• Axle set

Calibrated precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

• Standard executions

- **PBL-N**: brakeless wheel with zinc-plated steel bracket, fixed plate.
- **SBL-N**: brakeless wheel with zinc-plated steel bracket, turning plate.
- **SBF-N**: wheel with zinc-plated steel bracket, turning plate, with brake.
- **FBL-N**: brakeless wheel with zinc-plated steel bracket, turning plate and central pass-through hole.
- **FBF-N**: wheel with zinc-plated steel bracket, turning plate and central pass-through hole, with brake.
- **PBL-N-SST**: brakeless wheel with stainless steel bracket, fixed plate.
- **SBL-N-SST**: brakeless wheel with stainless steel bracket, turning plate.
- **SBF-N-SST**: wheel with stainless steel bracket, turning plate, with brake.
- **FBL-N-SST**: brakeless wheel with stainless steel bracket, turning plate and central pass-through hole.
- **FBF-N-SST**: wheel with stainless steel bracket, turning plate and central pass-through hole, with brake.

• Fixed plate bracket

Zinc-plated steel or AISI 304 stainless steel (SST version) sheet, the bracket is designed to withstand loads up to 3000N.

• Turning plate bracket

Zinc-plated steel or AISI 304 stainless steel (SST version) sheet, the bracket is designed to withstand loads up to 3000N.

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1).

Does not require maintenance. It consists of:

- 1) fitting plate: electrolytically zinc-plated steel or AISI 304 stainless steel sheet;
- 2) fork: electrolytically zinc-plated steel or AISI 304 stainless steel sheet;
- 3) ball race ring: electrolytically zinc-plated steel or AISI 304 stainless steel sheet;
- 4) central pin: incorporated in the plate, cold reflanged;
- 5) rotation system: dual grease-lubricated ring of ball;
- 6) dust seal: RAL 7015 dark grey technopolymer.

• Front-actuated brake

Total brake that locks the wheel and bracket rotation.

The optimised dimensions and the retractable pedal ensure minimal space occupied and maximum actuation ease. Hardened carbon steel or stainless steel (SST version) spring.

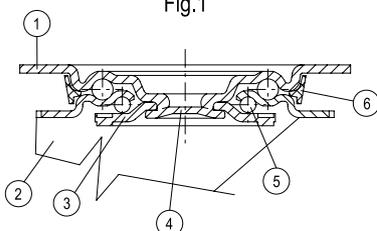
The trolley must be turned to use the device. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort. The braking effectiveness may be adjusted with a socket head screw M8.

Applications

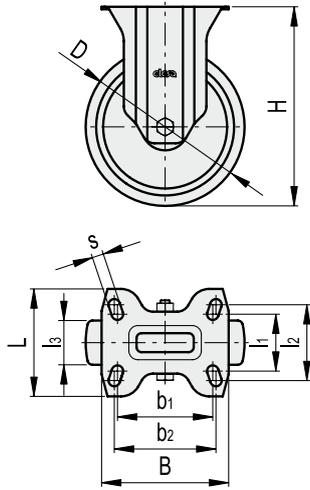
Excellent rolling resistance and elasticity, good wear and tearing resistance. For further information see RE.FF (see page 6) wheel.



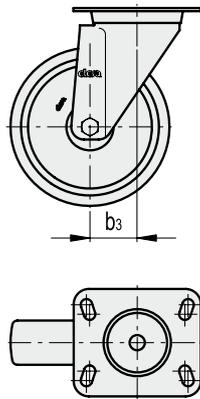
Fig.1



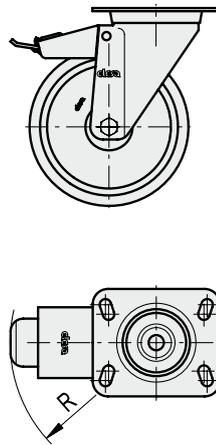
RE.FF-PBL-N
RE.FF-PBL-N-SST



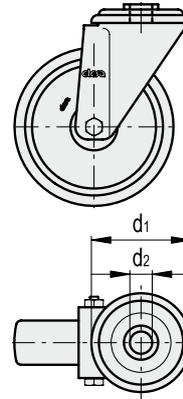
RE.FF-SBL-N
RE.FF-SBL-N-SST



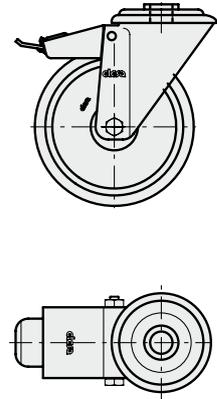
RE.FF-SBF-N
RE.FF-SBF-N-SST



RE.FF-FBL-N
RE.FF-FBL-N-SST



RE.FF-FBF-N
RE.FF-FBF-N-SST



Standard Elements		Main dimensions														Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
451151	RE.FF-080-PBL-N	80	30	107	100	85	9	75	45	80	60	-	-	-	-	1200	1200	380
451156	RE.FF-100-PBL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	1700	1700	430
451161	RE.FF-125-PBL-N	125	35	156	100	85	9	75	45	80	60	-	-	-	-	2300	2200	660
451166	RE.FF-150-PBL-N	150	45	194	140	114	11	105	73	105	85	-	-	-	-	2800	3000	1460
451051	RE.FF-080-SBL-N	80	30	107	100	85	9	75	45	80	60	39	-	-	-	1200	1200	620
451056	RE.FF-100-SBL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	1700	1700	740
451061	RE.FF-125-SBL-N	125	35	156	100	85	9	75	45	80	60	37	-	-	-	2300	2200	910
451066	RE.FF-150-SBL-N	150	45	194	140	110	11	105	73	105	87	56	-	-	-	2800	3000	1830
451101	RE.FF-080-SBF-N	80	30	107	100	85	9	75	45	80	60	39	120	-	-	1200	1200	810
451106	RE.FF-100-SBF-N	100	30	128	100	85	9	75	45	80	60	35	120	-	-	1700	1700	890
451111	RE.FF-125-SBF-N	125	35	156	100	85	9	75	45	80	60	37	120	-	-	2300	2200	1050
451116	RE.FF-150-SBF-N	150	45	194	140	110	11	105	73	105	87	56	156	-	-	2800	3000	2110
451171	RE.FF-80-FBL-N	80	30	107	-	-	-	-	-	-	-	39	-	73	12	1200	1200	550
451173	RE.FF-100-FBL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	1700	1700	670
451176	RE.FF-125-FBL-N	125	35	156	-	-	-	-	-	-	-	37	-	73	12	2300	2200	850
451179	RE.FF-150-FBL-N	150	45	188	-	-	-	-	-	-	-	56	-	102	20	2800	3000	1690
451181	RE.FF-80-FBF-N	80	30	107	-	-	-	-	-	-	-	39	120	73	12	1200	1200	730
451183	RE.FF-100-FBF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	1700	1700	880
451186	RE.FF-125-FBF-N	125	35	156	-	-	-	-	-	-	-	37	120	73	12	2300	2200	1000
451189	RE.FF-150-FBF-N	150	45	188	-	-	-	-	-	-	-	56	156	102	20	2800	3000	1980

Standard Elements		Main dimensions														Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
451301	RE.FF-080-PBL-N-SST	80	30	107	100	85	9	75	45	80	60	-	-	-	-	1200	1200	350
451306	RE.FF-100-PBL-N-SST	100	30	128	100	85	9	75	45	80	60	-	-	-	-	1700	1700	400
451311	RE.FF-125-PBL-N-SST	125	35	156	100	85	9	75	45	80	60	-	-	-	-	2300	2200	640
451201	RE.FF-080-SBL-N-SST	80	30	107	100	85	9	75	45	80	60	39	-	-	-	1200	1200	610
451206	RE.FF-100-SBL-N-SST	100	30	128	100	85	9	75	45	80	60	35	-	-	-	1700	1700	650
451211	RE.FF-125-SBL-N-SST	125	35	156	100	85	9	75	45	80	60	37	-	-	-	2300	2200	810
451251	RE.FF-080-SBF-N-SST	80	30	107	100	85	9	75	45	80	60	39	120	-	-	1200	1200	780
451256	RE.FF-100-SBF-N-SST	100	30	128	100	85	9	75	45	80	60	35	120	-	-	1700	1700	830
451261	RE.FF-125-SBF-N-SST	125	35	156	100	85	9	75	45	80	60	37	120	-	-	2300	2200	950
451351	RE.FF-080-FBL-N-SST	80	30	107	-	-	-	-	-	-	-	39	-	73	12	1200	1200	550
451353	RE.FF-100-FBL-N-SST	100	30	128	-	-	-	-	-	-	-	35	-	73	12	1700	1700	670
451356	RE.FF-125-FBL-N-SST	125	35	156	-	-	-	-	-	-	-	37	-	73	12	2300	2200	850
451361	RE.FF-080-FBF-N-SST	80	30	107	-	-	-	-	-	-	-	39	120	73	12	1200	1200	550
451363	RE.FF-100-FBF-N-SST	100	30	128	-	-	-	-	-	-	-	35	120	73	12	1700	1700	770
451366	RE.FF-125-FBF-N-SST	125	35	156	-	-	-	-	-	-	-	37	120	73	12	2300	2200	860

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F5

Mould-on polyurethane wheels

RoHS

2200 - 8500 N

• Covering

Mould-on polyurethane, hardness 95 Shore A.

• Wheel centre body

Die-cast aluminium.

• Hub

Hub with ball bearings. Ideal solution for heavy loads and continuous moving.

Applications

Excellent rolling resistance and elasticity, high wear and tearing resistance. See Technical Data on page 56 for selection parameters.

Environmental conditions

RE.F5 wheel is suitable for use in environments with the presence of atmospheric agents, alcohols and glycols; use in environments with the presence of organic and mineral acids, basic solutions and saturated vapour is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

Mechanical moving with towing devices

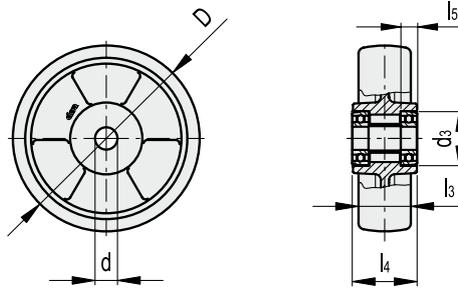
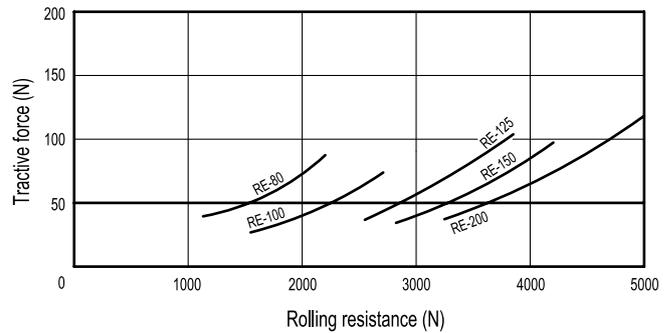
For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.F5 wheels are also supplied with bracket:

- RE.F5-N (see page 10): wheels with steel sheet bracket.
- RE.F5-H (see page 12): wheel with steel sheet bracket to be used for medium-heavy loads.



Standard Elements		Main dimensions						Static load #	Rolling resistance #	Dynamic carrying capacity #	$\Delta \triangle$
Code	Description	D	d	l ₃	l ₄	l ₅	d ₃	[N]	[N]	[N]	g
451501	RE.F5-080-RSL	80	12	25	30	8	28	2800	1500	2200	200
451506	RE.F5-100-RSL	100	12	30	40	10	32	3500	2250	2500	340
451511	RE.F5-125-RSL	125	12	35	40	10	32	5000	2800	4000	500
451516	RE.F5-150-RSL	150	20	40	50	14	47	8500	3300	6000	910
451521	RE.F5-200-RSL	200	25	50	55	15	52	10000	3600	8500	1450

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.F5-N

Mould-on polyurethane wheels with steel sheet bracket

RoHS

2000 - 3000 N

• Covering

Mould-on polyurethane, hardness 95 Shore A.

• Wheel centre body

Die-cast aluminium.

• Hub and axle set

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

• Standard executions

- **PSL-N**: brakeless wheel with zinc-plated steel fixed plate bracket.
- **SSL-N**: brakeless wheel with zinc-plated steel turning plate bracket.
- **SSF-N**: wheel with zinc-plated steel turning plate bracket, with brake.
- **FSL-N**: brakeless wheel with zinc-plated steel turning plate bracket and centre pass-through hole.
- **FSF-N**: wheel with zinc-plated steel turning plate bracket and centre pass-through hole, with brake.

• Fixed plate bracket

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N.

• Turning plate bracket

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N. The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1). Does not require maintenance.

It consists of:

- 1) fitting plate: electrolytically zinc-plated steel sheet;
- 2) fork: electrolytically zinc-plated steel sheet;
- 3) ball race ring: electrolytically zinc-plated steel sheet;
- 4) central pin: incorporated in the plate, cold reflanged;
- 5) rotation system: dual grease-lubricated ring of balls;
- 6) dust seal: RAL 7015 dark grey technopolymer.

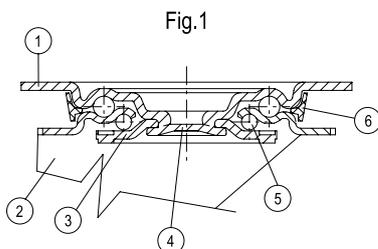
• Front-actuated brake

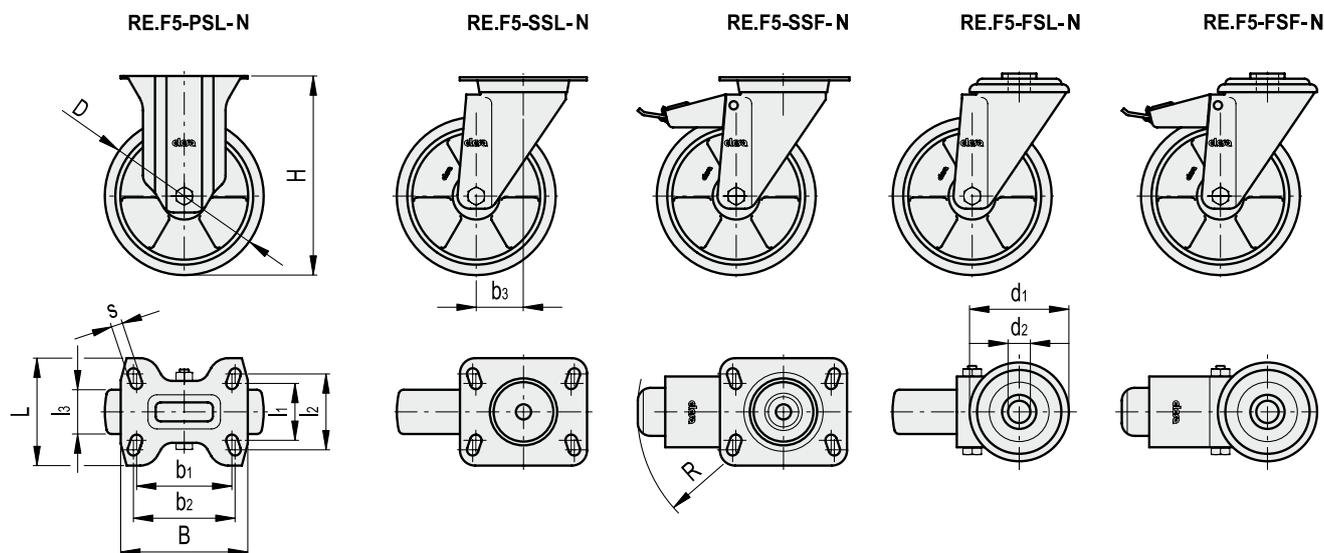
Total brake that locks the wheel and bracket rotation. The optimised dimensions and the retractable pedal ensure minimal space occupied and maximum actuation ease. Hardened carbon steel spring.

The trolley must be turned to use the device. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort. The braking efficacy may be adjusted with a socket head screw M8.

Applications

Excellent rolling resistance and elasticity, high wear and tearing resistance. For further information see RE.F5 (see page 9) wheel.





Standard Elements		Main dimensions														Rolling resistance #	Dynamic carrying capacity #	
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
451651	RE.F5-080-PSL-N	80	25	107	100	85	9	75	45	80	60	-	-	-	-	1500	2000	520
451656	RE.F5-100-PSL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	2250	2000	690
451661	RE.F5-125-PSL-N	125	35	156	100	85	9	75	45	80	60	-	-	-	-	2800	2200	890
451666	RE.F5-150-PSL-N	150	40	194	140	110	11	105	73	105	87	-	-	-	-	3300	3000	2040
451671	RE.F5-200-PSL-N	200	50	240	140	110	11	105	73	105	87	-	-	-	-	3600	3000	2760
451551	RE.F5-080-SSL-N	80	25	107	100	85	9	75	45	80	60	39	-	-	-	1500	2000	720
451556	RE.F5-100-SSL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	2250	2000	940
451561	RE.F5-125-SSL-N	125	35	156	100	85	9	75	45	80	60	37	-	-	-	2800	2200	1140
451565	RE.F5-150-SSL-N	150	40	194	140	110	11	105	73	105	87	56	-	-	-	3300	3000	2340
451571	RE.F5-200-SSL-N	200	50	240	140	110	11	105	73	105	87	56	-	-	-	3600	3000	3050
451601	RE.F5-080-SSF-N	80	25	107	100	85	9	75	45	80	60	39	120	-	-	1500	2000	910
451606	RE.F5-100-SSF-N	100	30	125	100	85	9	75	45	80	60	35	120	-	-	2250	2000	1080
451611	RE.F5-125-SSF-N	125	35	156	100	85	9	75	45	80	60	37	120	-	-	2800	2200	1280
451615	RE.F5-150-SSF-N	150	40	194	140	110	11	105	73	105	87	56	156	-	-	3300	3000	2630
451621	RE.F5-200-SSF-N	200	50	240	140	110	11	105	73	105	87	56	156	-	-	3600	3000	3250
451851	RE.F5-080-FSL-N	80	25	107	-	-	-	-	-	-	-	39	-	73	12	1500	2000	650
451856	RE.F5-100-FSL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	2250	2000	880
451861	RE.F5-125-FSL-N	125	35	156	-	-	-	-	-	-	-	37	-	73	12	2800	2200	1080
451866	RE.F5-150-FSL-N	150	40	194	-	-	-	-	-	-	-	56	-	102	20	3300	3000	2200
451871	RE.F5-200-FSL-N	200	50	240	-	-	-	-	-	-	-	56	-	102	20	3600	3000	2950
451901	RE.F5-080-FSF-N	80	25	107	-	-	-	-	-	-	-	39	120	73	12	1500	2000	780
451906	RE.F5-100-FSF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	2250	2000	1020
451911	RE.F5-125-FSF-N	125	35	156	-	-	-	-	-	-	-	37	120	73	12	2800	2200	1230
451916	RE.F5-150-FSF-N	150	40	194	-	-	-	-	-	-	-	56	156	102	20	3300	3000	2490
451921	RE.F5-200-FSF-N	200	50	240	-	-	-	-	-	-	-	56	156	102	20	3600	3000	3240

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F5-H

Mould-on polyurethane wheels with steel sheet bracket for medium-heavy loads

RoHS

3500 - 7500 N

- **Covering**

Mould-on polyurethane, hardness 95 Shore A.

- **Wheel centre body**

Die-cast aluminium.

- **Hub and axle set**

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

- **Standard executions**

- **PSL-H**: brakeless wheel with zinc-plated steel fixed plate bracket for medium-heavy loads.
- **SSL-H**: brakeless wheel with zinc-plated steel turning plate bracket for medium-heavy loads.
- **SSF-H**: wheel with zinc-plated steel turning plate bracket for medium-heavy loads, with brake.

- **Fixed plate bracket**

Yellow zinc-plated steel sheet (test in saline fog chamber above 72h). The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications.

- **Turning plate bracket**

The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications (see fig. 1). It consists of:

- 1) fitting plate: yellow zinc-plated steel sheet;
- 2) fork: yellow zinc-plated steel sheet;
- 3) ball race ring: yellow zinc-plated steel sheet;
- 4) central pin: class 8.8 steel screw and steel nut;
- 5) rotation system: dual grease-lubricated ring of ball;
- 6) dust seal: RAL 7015 dark grey technopolymer.

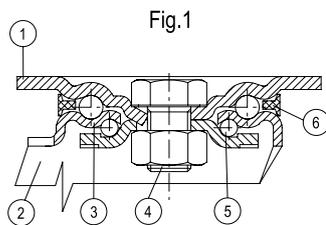
- **Brake**

Front brake (RE.F5-125) or rear brake (RE.F5-150-200) dual-effect with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

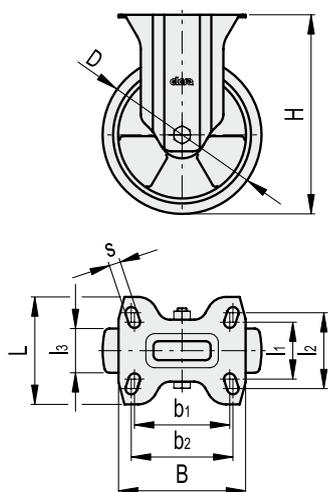
The braking efficacy may be adjusted with a socket head screw M8.

Applications

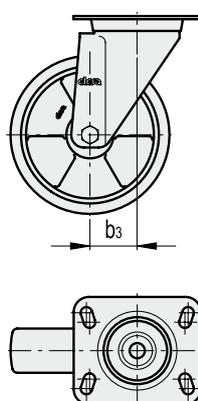
Excellent rolling resistance and elasticity, high wear and tearing resistance. For further information see RE.F5 (see page 9) wheel.



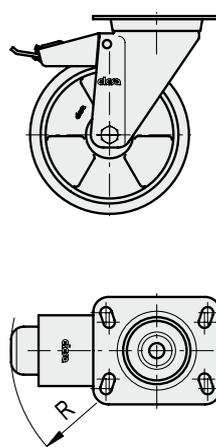
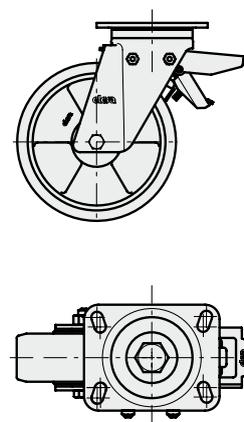
RE.F5-PSL-H



RE.F5-SSL-H



RE.F5-125-SSF-H

RE.F5-150-SSF-H
RE.F5-200-SSF-H

Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	Δ/Δ	
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	[N]	[N]	g
451801	RE.F5-125-PSL-H	125	35	161	100	85	9	75	45	80	60	-	-	2800	3500	970
451806	RE.F5-150-PSL-H	150	40	200	140	114	11	105	73	105	85	-	-	3300	6000	2190
451811	RE.F5-200-PSL-H	200	50	250	140	114	11	105	73	105	85	-	-	3600	7500	2480
451701	RE.F5-125-SSL-H	125	35	161	100	85	9	75	45	80	60	48	-	2800	3500	1390
451706	RE.F5-150-SSL-H	150	40	200	140	110	11	105	73	105	87	70	-	3300	6000	3180
451711	RE.F5-200-SSL-H	200	50	250	140	110	11	105	73	105	87	70	-	3600	7500	3940
451751	RE.F5-125-SSF-H	125	35	161	100	85	9	75	45	80	60	48	120	2800	3500	1540
451756	RE.F5-150-SSF-H	150	40	200	140	110	11	105	73	105	87	70	146	3300	6000	3750
451761	RE.F5-200-SSF-H	200	50	250	140	110	11	105	73	105	87	70	146	3600	7500	4510

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F4

Mould-on polyurethane wheels

RoHS

3000 - 25000 N

• Covering

Mould-on polyurethane, hardness 95 Shore A.

• Wheel centre body

Cast iron.

• Standard executions

- **RBL:** hub directly made into the centre. The wheel hub is designed to be easily reprocessed to obtain a keyway or housing for clamping. Any further reprocesses on the wheel must be carried out with maximum working temperature up to 80°C (recommended max limit temperature during normal use of the product), to prevent degradation of the polyurethane coating.

Ideal solution for equipment with drive wheels.

- **RSL:** hub with ball bearings. Ideal solution for heavy loads and continuous moving.

• Special executions on request

Hole with keyway in compliance with UNI 6604, UNI 6607 e ISO 2941 (RBL version).

Applications

Excellent rolling resistance and elasticity, high wear and tearing resistance.

See Technical Data on page 56 for selection parameters.

Environmental conditions

RE.F4 wheel is suitable for use in environments with the presence of atmospheric agents, alcohols and glycols; use in environments with the presence of organic and mineral acids, basic solutions and saturated vapour is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

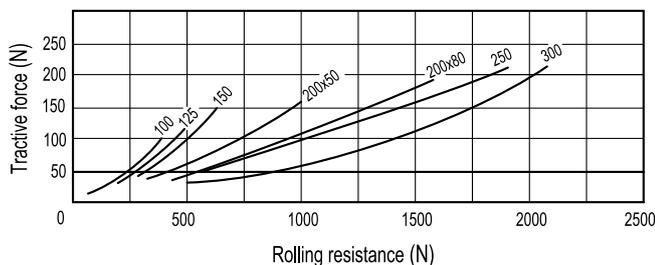
RE.F4 wheels are also supplied with bracket:

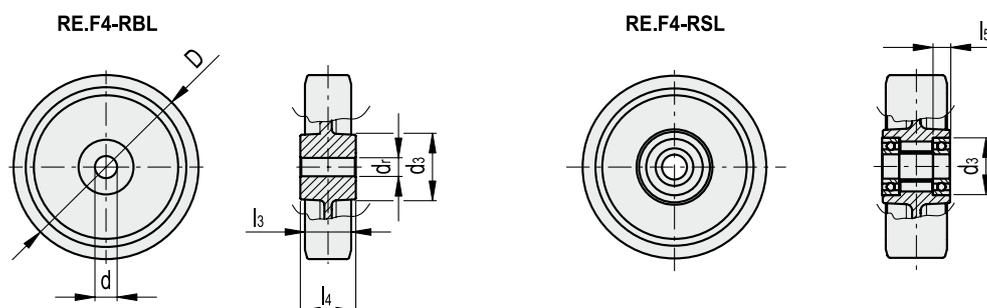
- RE.F4-H (see page 16): wheels with steel sheet bracket to be used for medium-heavy loads.
- RE.F4-WH (see page 18): wheels with electro-welded steel bracket to be used for heavy loads.
- RE.F4-WEH (see page 20): wheel with electro-welded steel bracket to be used for extra-heavy loads.



14

Castors and wheels





Standard Elements		Main dimensions						Static load #	Dynamic carrying capacity #	⚖
Code	Description	D	d	l ₃	l ₄	d ₃	d _r *	[N]	[N]	g
451401	RE.F4-100-RBL	100	15	40	45	55	30	5000	3000	1500
451402	RE.F4-125-RBL	125	20	40	60	60	30	6000	4000	1300
451403	RE.F4-150-RBL	150	20	50	60	70	40	9100	7000	3700
451404	RE.F4-200-RBL	200	20	50	60	70	40	15000	9500	4600
451405	RE.F4-250-RBL	250	40	80	80	95	60	28000	16000	11000
451406	RE.F4-300-RBL	300	50	100	100	120	80	42000	25000	21200

* Max diameter permissible for hole to ensure the static load values reported.

See Technical Data on page 51 for static load and dynamic carrying capacity.

Standard Elements		Main dimensions						Static load #	Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	d	l ₃	l ₄	l ₅	d ₃	[N]	[N]	[N]	g
451411	RE.F4-100-RSL	100	15	38	40	11	35	5000	2200	3800	1020
451412	RE.F4-125-RSL	125	20	50	55	14	47	8000	2700	5500	1980
451413	RE.F4-150x50-RSL	150	20	50	55	14	47	9100	2900	7000	2500
451410	RE.F4-150x80-RSL	150	25	80	88	18	62	17000	4000	10000	5690
451414	RE.F4-200x50-RSL	200	20	50	55	14	47	15000	3800	10000	3650
451415	RE.F4-200x80-RSL	200	25	80	86	17	62	20000	4500	16000	7260
451416	RE.F4-250-RSL	250	25	80	86	17	62	28000	5000	19000	9810
451417	RE.F4-300-RSL	300	30	80	86	17	62	34000	6000	23000	13800

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.F4-H

Mould-on polyurethane wheels with steel sheet bracket for medium-heavy loads

RoHS

3500 - 7500 N

- **Covering**

Mould-on polyurethane, hardness 95 Shore A.

- **Wheel centre body**

Cast iron.

- **Hub and axle set**

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

- **Standard executions**

- **PSL-H**: brakeless wheel with zinc-plated steel fixed plate bracket for medium-heavy loads.
- **SSL-H**: brakeless wheel with zinc-plated steel turning plate bracket for medium-heavy loads.
- **SSF-H**: wheel with zinc-plated steel turning plate bracket for medium-heavy loads, with brake.

- **Fixed plate bracket**

Yellow zinc-plated steel sheet (test in saline fog chamber above 72h). The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications.

- **Turning plate bracket**

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance. Does not require maintenance.

The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications.

It consists of (see fig. 1):

- 1) fitting plate: yellow zinc-plated steel sheet;
- 2) fork: yellow zinc-plated steel sheet;
- 3) ball race ring: yellow zinc-plated steel sheet;
- 4) central pin: class 8.8 steel screw and steel nut;
- 5) rotation system: dual grease-lubricated ring of balls;
- 6) dust seal: RAL 7015 dark grey technopolymer.

- **Brake**

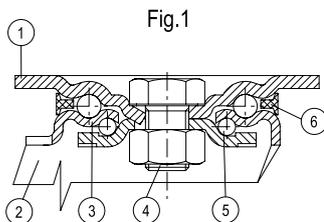
Front brake (RE.F4-100) or rear brake (RE.F4-125-150-200) dual-effect with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

The braking efficacy may be adjusted with a socket head screw M8.

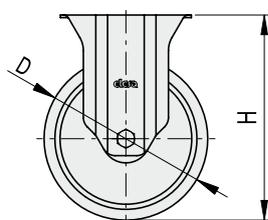
Applications

Suitable for heavy industrial applications. The mould-on polyurethane wheel ensures excellent rolling resistance and elasticity, high wear and tearing resistance.

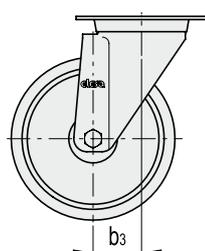
For further information see RE.F4 (see page 14) wheel.



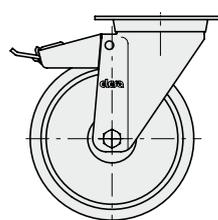
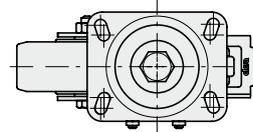
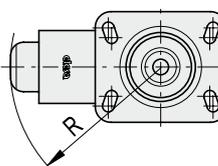
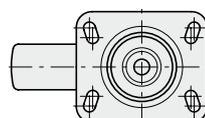
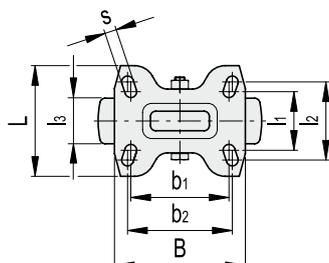
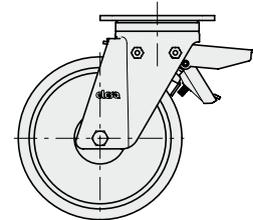
RE.F4-PSL-H



RE.F4-SSL-H



RE.F4-100-SSF-H

RE.F4-125-SSF-H
RE.F4-150-SSF-H
RE.F4-200-SSF-H

Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	△	
Code	Description	D	l ₃	H	B	L	s	b ₁	b ₂	l ₁	l ₂	b ₃	R	[N]	[N]	g
451461	RE.F4-100-PSL-H	100	38	138	100	85	9	75	80	45	60	46	123	2200	3500	1930
451462	RE.F4-125-PSL-H	125	50	170	140	110	11	105	-	73	87	70	126	2700	5500	3660
451463	RE.F4-150-PSL-H	150	50	200	140	110	11	105	-	73	87	70	126	2900	7000	4810
451464	RE.F4-200-PSL-H	200	50	250	140	110	11	105	-	73	87	70	126	3800	7500	6060
451421	RE.F4-100-SSL-H	100	38	138	100	85	9	75	80	45	60	46	123	2200	3500	1930
451422	RE.F4-125-SSL-H	125	50	170	140	110	11	105	-	73	87	70	126	2700	5500	3660
451423	RE.F4-150-SSL-H	150	50	200	140	110	11	105	-	73	87	70	126	2900	7000	4810
451424	RE.F4-200-SSL-H	200	50	250	140	110	11	105	-	73	87	70	126	3800	7500	6060
451441	RE.F4-100-SSF-H	100	38	138	100	85	9	75	80	45	60	46	123	2200	3500	1930
451442	RE.F4-125-SSF-H	125	50	170	140	110	11	105	-	73	87	70	126	2700	5500	3660
451443	RE.F4-150-SSF-H	150	50	200	140	110	11	105	-	73	87	70	126	2900	7000	4810
451444	RE.F4-200-SSF-H	200	50	250	140	110	11	105	-	73	87	70	126	3800	7500	6060

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F4-WH

Mould-on polyurethane wheels with electro-welded steel bracket for heavy loads

RoHS

5500 - 9000 N

• Covering

Mould-on polyurethane, hardness 95 Shore A.

• Wheel centre body

Cast iron.

• Hub and axle set

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

• Standard executions

- **PSL-WH**: brakeless wheel with zinc-plated electro-welded steel fixed plate bracket for heavy loads.
- **SSL-WH**: brakeless wheel with zinc-plated electro-welded steel turning plate bracket for heavy loads.
- **SSF-WH**: wheel with zinc-plated electro-welded steel turning plate bracket for heavy loads, with brake.

• Fixed plate bracket

Electrolytically zinc-plated electro-welded steel. The bracket is designed to withstand loads up to 9000N. Suitable for heavy industrial applications and severe conditions of use, as side impact and high speeds.

• Turning plate bracket

The presence of an axial bearing and a conical bearing ensures excellent manoeuvrability also at full load and increases the resistance of the bracket against side impact. It is equipped with lubricator and anti-loosening system of the locking nut.

The bracket is designed to withstand loads up to 9000N. Suitable for heavy industrial applications and severe conditions of use, as side impact and high speeds.

It consists of (see fig. 1):

- 1) fitting plate: forged steel with built-in pin, electrolytically zinc-plated;
- 2) fork: drawn sides electro-welded to the flange, electrolytically zinc-plated;
- 3) Rotation system: axial ball bearing and conical roller bearing;
- 4) Lubricator;
- 5) Anti-loosening system of the locking nut.

• Rear-actuated brake

Dual-effect rear brake with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

The braking efficacy may be adjusted with a socket head screw M8.

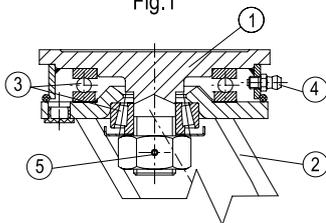
Applications

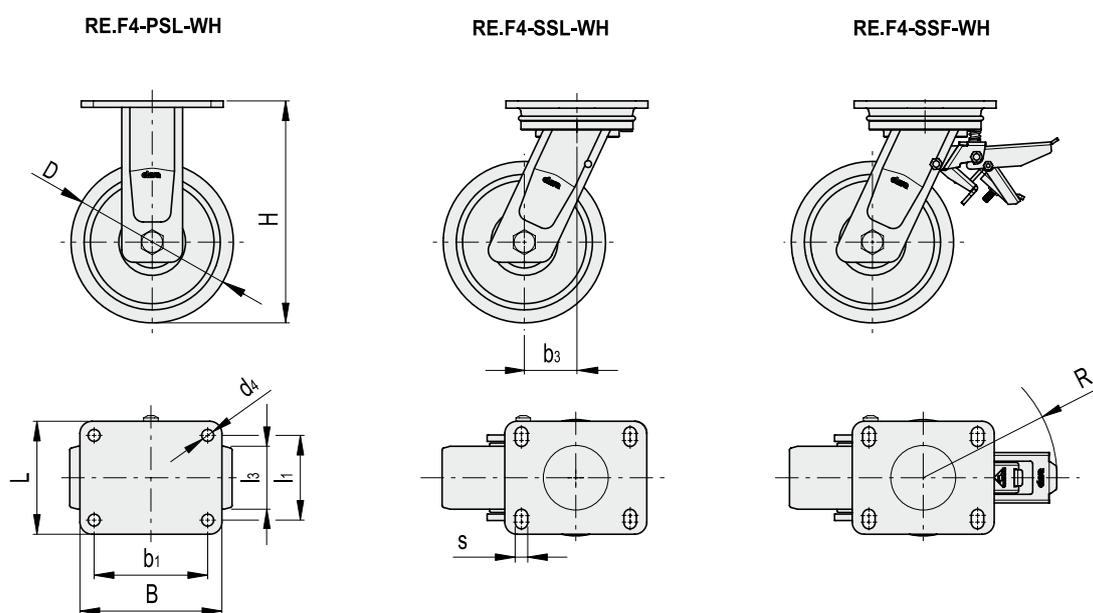
Suitable for heavy industrial applications and for severe conditions of use. The mould-on polyurethane wheel ensures excellent rolling resistance and elasticity, high wear and tearing resistance.

For further information see RE.F4 (see page 14) wheel.



Fig.1





Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	\triangle/\triangle
Code	Description	D	l ₃	H	B	L	b ₁	l ₁	b ₃	R	d ₄	s	[N]	[N]	g
451465	RE.F4-125-PSL-WH	125	50	182	135	110	105	80	51	157	11	-	2700	5500	4880
451466	RE.F4-150-PSL-WH	150	50	210	135	110	105	80	60	157	11	-	2900	7000	5500
451467	RE.F4-200-PSL-WH	200	50	252	135	110	105	80	70	157	11	-	3800	9000	6770
451425	RE.F4-125-SSL-WH	125	50	182	135	110	105	80	51	157	-	11	2700	5500	4880
451426	RE.F4-150-SSL-WH	150	50	210	135	110	105	80	60	157	-	11	2900	7000	5500
451427	RE.F4-200-SSL-WH	200	50	252	135	110	105	80	70	157	-	11	3800	9000	6770
451446	RE.F4-125-SSF-WH	125	50	182	135	110	105	80	51	157	-	11	2700	5500	4880
451447	RE.F4-150-SSF-WH	150	50	210	135	110	105	80	60	157	-	11	2900	7000	5500
451448	RE.F4-200-SSF-WH	200	50	252	135	110	105	80	70	157	-	11	3800	9000	6770

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F4-WEH

Mould-on polyurethane wheels with electro-welded steel bracket for extra-heavy loads

RoHS

10000 - 23000 N

• Covering

Mould-on polyurethane, hardness 95 Shore A.

• Wheel centre body

Cast iron.

• Hub and axle set

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

• Standard executions

- **PSL-WEH**: brakeless wheel with electro-welded steel powder coating fixed plate bracket for extra-heavy loads.
- **SSL-WEH**: brakeless wheel with electro-welded steel powder coating turning plate bracket for extra-heavy loads.
- **SSF-WEH**: wheel with electro-welded steel powder coating turning plate bracket for extra-heavy loads, with brake.

• Fixed plate bracket

Electro-welded steel with dark green powder coating. The bracket is designed to withstand loads up to 25000N. Suitable for heavy industrial applications and severe conditions of use, as side impact and high speeds.

• Turning plate bracket

The presence of an axial bearing and a conical bearing ensures excellent manoeuvrability also at full load and increases the resistance of the support against side impact. It is equipped with lubricator and anti-loosening system of the locking nut.

The bracket is designed to withstand loads up to 25000N. Suitable for heavy industrial applications and for severe conditions of use, as side impact and high speeds.

It consists of (see fig. 1):

- 1) fitting plate: forged steel with built-in pin, dark green powder coating;
- 2) fork: drawn sides electro-welded to the flange, dark green powder coating;
- 3) Rotation system: axial ball bearing and conical roller bearing;
- 4) Lubricator;
- 5) Anti-loosening system of the locking nut.

• Rear-actuated brake

Dual-effect rear brake with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

The braking efficacy may be adjusted with a socket head screw M8.

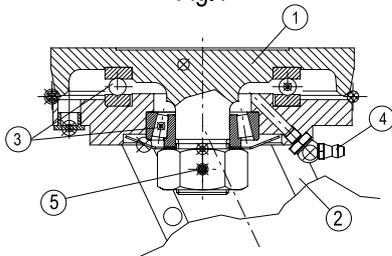
Applications

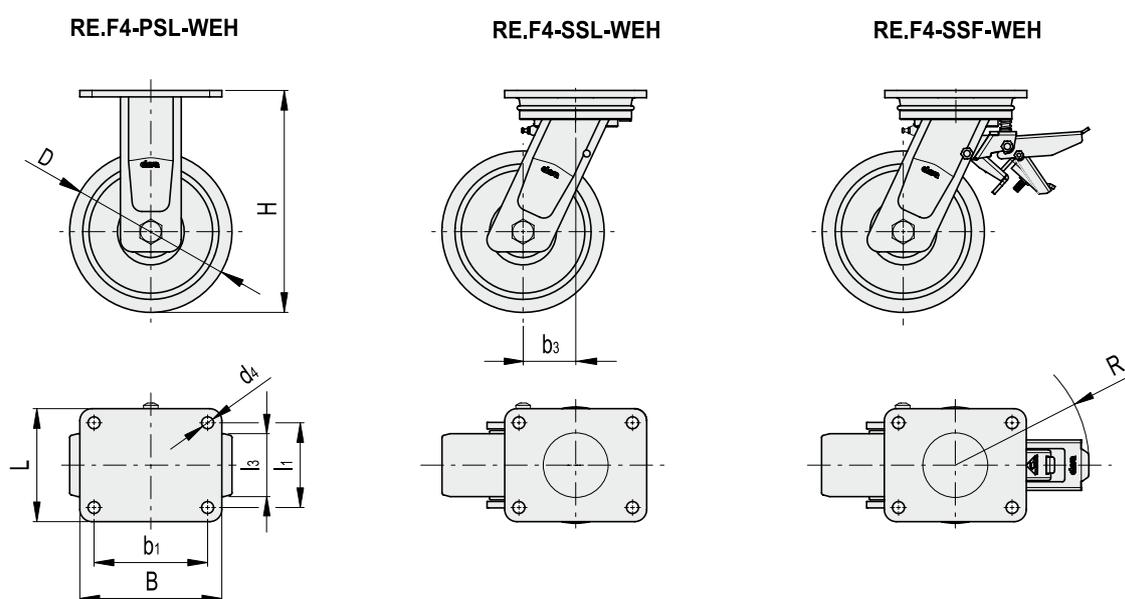
Suitable for heavy industrial applications and for severe conditions of use. The mould-on polyurethane wheel ensures excellent rolling resistance and elasticity, high wear and tearing resistance.

For further information see RE.F4 (see page 14) wheel.



Fig.1





Standard Elements		Main dimensions										Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	b ₁	l ₁	b ₃	R	d ₄	[N]	[N]	g
451468	RE.F4-150-PSL-WEH	150	80	218	175	140	140	105	50	166	14	4000	10000	1215
451469	RE.F4-200-PSL-WEH	200	80	275	175	140	140	105	65	166	14	4500	16000	1372
451470	RE.F4-250-PSL-WEH	250	80	325	200	160	160	120	74	166	17	5000	19000	1756
451472	RE.F4-300-PSL-WEH	300	80	365	200	160	160	120	81	166	17	6000	23000	2167
451428	RE.F4-150-SSL-WEH	150	80	218	175	140	140	105	50	166	14	4000	10000	1215
451429	RE.F4-200-SSL-WEH	200	80	275	175	140	140	105	65	166	14	4500	16000	1372
451430	RE.F4-250-SSL-WEH	250	80	325	200	160	160	120	74	166	17	5000	19000	1756
451432	RE.F4-300-SSL-WEH	300	80	365	200	160	160	120	81	166	17	6000	23000	2167
451449	RE.F4-150-SSF-WEH	150	80	218	175	140	140	105	50	166	14	4000	10000	1215
451450	RE.F4-200-SSF-WEH	200	80	275	175	140	140	105	65	166	14	4500	16000	1372
451451	RE.F4-250-SSF-WEH	250	80	325	200	160	160	120	74	166	17	5000	19000	1756
451452	RE.F4-300-SSF-WEH	300	80	365	200	160	160	120	81	166	17	6000	23000	2167

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.G5

Mould-on polyurethane rollers

RoHS

7000 - 10000 N

Covering

Mould-on polyurethane, hardness 95 Shore A.

Wheel centre body

Steel.

Hub

Hub with ball bearings. Ideal solution for heavy loads and continuous moving.

Applications

Excellent rolling resistance and elasticity, high wear and tearing resistance. See Technical Data on page 56 for selection parameters.

Environmental conditions

Suitable for use in environments with the presence of atmospheric agents, alcohols and glycols; use in environments with the presence of organic and mineral acids, basic solutions and saturated vapour is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

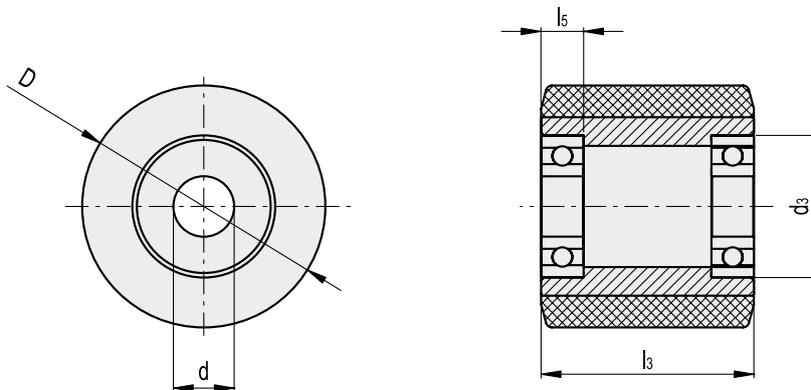
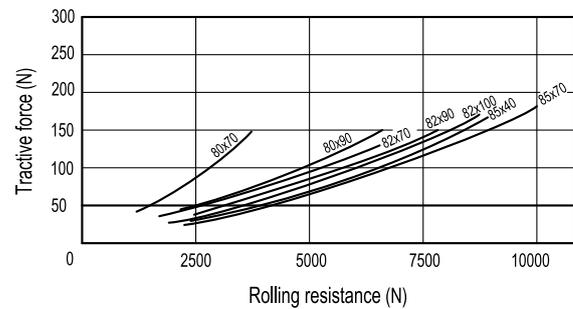
The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.



Standard Elements		Main dimensions					Static load #	Rolling resistance #	Dynamic carrying capacity #	△△
Code	Description	D	d	d3	l3	l5	[N]	[N]	[N]	g
452791	RE.G5-80x70-RSL	80	20	47	70	14	8000	2500	7000	1060
452792	RE.G5-80x90-RSL	80	20	47	90	14	10000	3350	9000	1350
452797	RE.G5-82x70-RSL	82	20	47	70	14	8000	2550	7000	1090
452798	RE.G5-82x90-RSL	82	20	47	90	14	10000	3400	9000	1330
452799	RE.G5-82x100-RSL	82	20	47	100	14	11000	3900	10000	1450
452793	RE.G5-85x40-RSL	85	20	47	40	14	4500	1500	4000	720
452794	RE.G5-85x70-RSL	85	20	47	70	14	8000	2650	7000	1120
452795	RE.G5-85x90-RSL	85	20	47	90	14	10000	3500	9000	1390
452796	RE.G5-85x100-RSL	85	20	47	100	14	11000	4000	10000	1520

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.F8

Monolithic wheels

RoHS

1200 - 9000 N

• Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

• Standard executions

- **RBL:** hub directly made into the wheel centre body.
- **RSL:** hub with ball bearings. Ideal solution for heavy loads and continuous moving.

Applications

Excellent wear and tearing resistance.

See Technical Data on page 56 for selection parameters.

Environmental conditions

Suitable for use in humid environments, with the presence of highly aggressive chemicals. Use in environments with the presence of strong organic acids and concentrated minerals is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

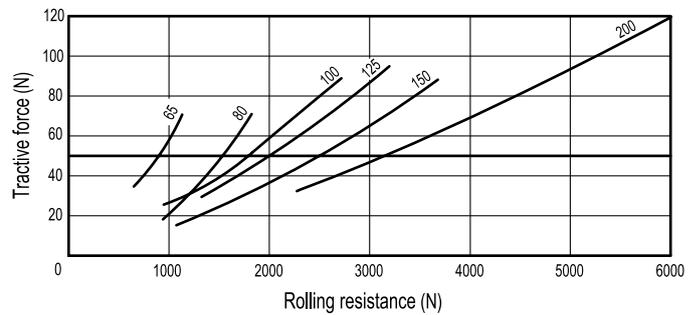
If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.F8 wheel are supplied also with bracket:

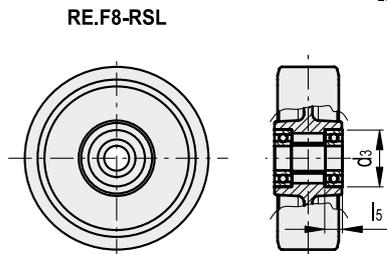
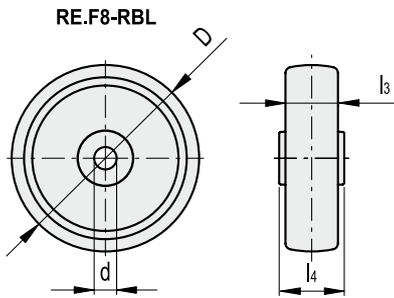
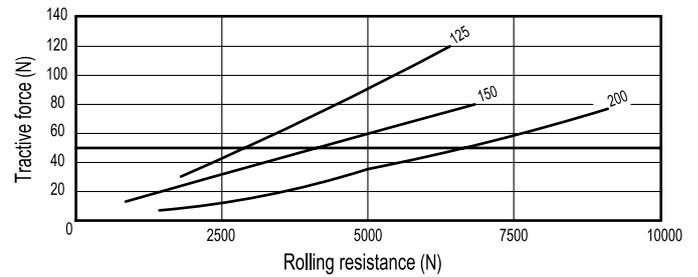
- RE.F8-N (see page 24): wheels with steel sheet bracket;
- RE.F8-H (see page 26): wheels with steel sheet bracket for medium-heavy loads;
- RE.F8-VWH (see page 28): wheels with electro-welded steel sheet bracket for heavy loads.



RE.F8-RBL



RE.F8-RSL



Standard Elements		Main dimensions						Static load #	Rolling resistance #	Dynamic carrying capacity #	△△
Code	Description	D	d	l3	l4	l5	d3	[N]	[N]	[N]	g
450501	RE.F8-065-RBL	65	12	30	34	-	-	1250	900	1200	60
450506	RE.F8-080-RBL	80	12	30	39	-	-	2000	1500	1800	80
450511	RE.F8-100-RBL	100	12	30	44	-	-	3500	1750	3000	130
450516	RE.F8-125-RBL	125	15	38	44	-	-	4500	2000	4000	230
450521	RE.F8-150-RBL	150	20	45	58	-	-	6000	2500	5000	340
450526	RE.F8-200-RBL	200	20	50	58	-	-	10000	4000	9000	500
▶ 449451	RE.F8-125-RSL	125	20	45	56	13	47	7000	4000	6500	610
▶ 449452	RE.F8-150-RSL	150	20	45	56	13	47	8000	4550	7500	740
▶ 449453	RE.F8-200-RSL	200	20	50	56	13	47	10000	6500	9000	1100

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

Monolithic wheels with steel sheet bracket

RoHS

1200 - 3000 N

• Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

• Hub

Directly made into the centre.

• Axle set

Calibrated precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

• Standard executions

- **PBL-N**: brakeless wheel with zinc-plated steel bracket, fixed plate.
- **SBL-N**: brakeless wheel with zinc-plated steel bracket, turning plate.
- **SBF-N**: wheel with zinc-plated steel bracket, turning plate, with brake.
- **FBL-N**: brakeless wheel with zinc-plated steel bracket, turning plate and central pass-through hole.
- **FBF-N**: wheel with zinc-plated steel bracket, turning plate and central pass-through hole, with brake.

- **PBL-N-SST**: brakeless wheel with stainless steel bracket, fixed plate.
- **SBL-N-SST**: brakeless wheel with stainless steel bracket, turning plate.
- **SBF-N-SST**: wheel with stainless steel bracket, turning plate, with brake.
- **FBL-N-SST**: brakeless wheel with stainless steel bracket, turning plate and central pass-through hole.
- **FBF-N-SST**: wheel with stainless steel bracket, turning plate and central pass-through hole, with brake.

• Fixed plate bracket

Zinc-plated steel or AISI 304 stainless steel (SST version) sheet, the bracket is designed to withstand loads up to 3000N.

• Turning plate bracket

Zinc-plated steel or AISI 304 stainless steel (SST version) sheet, the bracket is designed to withstand loads up to 3000N.

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1). Does not require maintenance.

It consists of:

- 1) fitting plate: electrolytically zinc-plated steel or AISI 304 stainless steel sheet ;
- 2) fork: electrolytically zinc-plated steel or AISI 304 stainless steel sheet;
- 3) ball race ring: electrolytically zinc-plated steel or AISI 304 stainless steel sheet;
- 4) central pin: incorporated in the plate, cold reflanged;
- 5) rotation system: dual grease-lubricated ring of balls;
- 6) dust seal: RAL 7015 dark grey technopolymer.

• Front-actuated brake

Total brake that locks the wheel and bracket rotation.

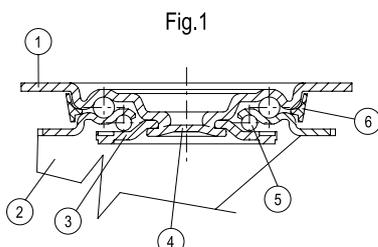
The optimised dimensions and the retractible pedal ensure minimal space occupied and maximum actuation ease.

Hardened carbon steel or stainless steel (SST version) spring.

Applications

Excellent wear and tearing resistance.

For further information see RE.F8 (see page 23) wheel.



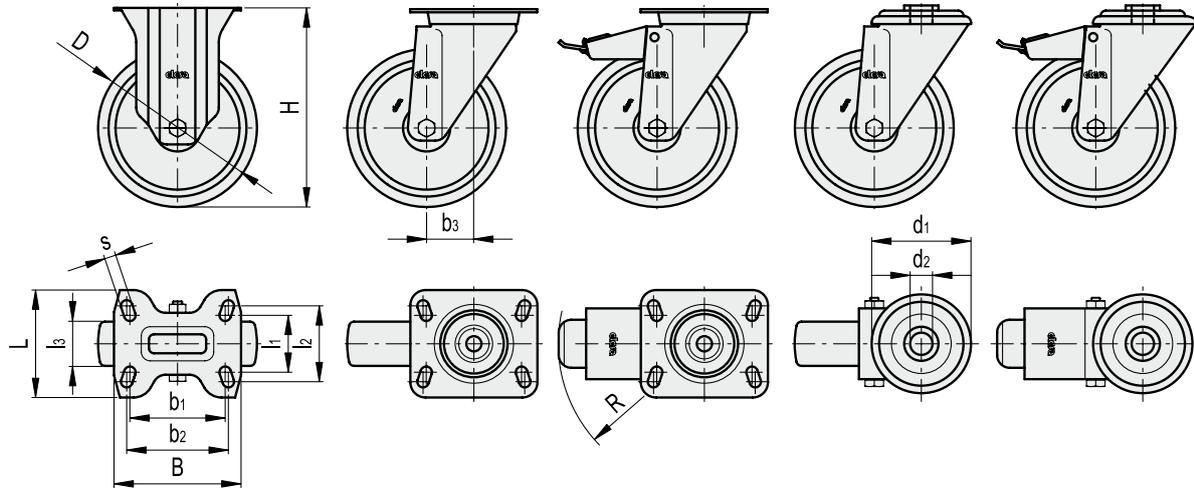
RE.F8-PBL-N
RE.F8-PBL-N-SST

RE.F8-SBL-N
RE.F8-SBL-N-SST

RE.F8-SBF-N
RE.F8-SBF-N-SST

RE.F8-FBL-N
RE.F8-FBL-N-SST

RE.F8-FBF-N
RE.F8-FBF-N-SST



Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	⚖			
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
450651	RE.F8-065-PBL-N	65	30	100	100	85	9	75	45	80	60	-	-	-	-	900	1200	370
450656	RE.F8-080-PBL-N	80	30	107	100	85	9	75	45	80	60	-	-	-	-	1500	1800	390
450661	RE.F8-100-PBL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	1750	2000	460
450666	RE.F8-125-PBL-N	125	38	156	100	85	9	75	45	80	60	-	-	-	-	2000	2200	640
450671	RE.F8-150-PBL-N	150	45	194	140	114	11	105	73	105	85	-	-	-	-	2500	3000	1450
450676	RE.F8-200-PBL-N	200	50	240	140	114	11	105	73	105	85	-	-	-	-	3150	3000	1920
450551	RE.F8-065-SBL-N	65	30	100	100	85	9	75	45	80	60	39	-	-	-	900	1200	570
450556	RE.F8-080-SBL-N	80	30	107	100	85	9	75	45	80	60	39	-	-	-	1500	1800	580
450561	RE.F8-100-SBL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	1750	2000	650
450566	RE.F8-125-SBL-N	125	38	156	100	85	9	75	45	80	60	37	-	-	-	2000	2200	890
450571	RE.F8-150-SBL-N	150	45	194	140	110	11	105	73	105	87	56	-	-	-	2500	3000	1770
450576	RE.F8-200-SBL-N	200	50	240	140	110	11	105	73	105	87	56	-	-	-	3150	3000	2140
450601	RE.F8-080-SBF-N	80	30	107	100	85	9	75	45	80	60	39	120	-	-	1500	1800	780
450606	RE.F8-100-SBF-N	100	30	128	100	85	9	75	45	80	60	35	120	-	-	1750	2000	850
450611	RE.F8-125-SBF-N	125	40	156	100	85	9	75	45	80	60	37	120	-	-	2000	2200	1040
450616	RE.F8-150-SBF-N	150	45	194	140	110	11	105	73	105	87	56	156	-	-	2500	3000	1990
450621	RE.F8-200-SBF-N	200	50	240	140	110	11	105	73	105	87	56	156	-	-	3150	3000	2330
450681	RE.F8-065-FBL-N	65	30	100	-	-	-	-	-	-	-	39	-	73	12	900	1200	520
450683	RE.F8-080-FBL-N	80	30	107	-	-	-	-	-	-	-	39	-	73	12	1500	1800	535
450685	RE.F8-100-FBL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	1750	2000	555
450687	RE.F8-125-FBL-N	125	38	156	-	-	-	-	-	-	-	37	-	73	12	2000	2200	850
450689	RE.F8-150-FBL-N	150	45	188	-	-	-	-	-	-	-	56	-	102	20	2500	3000	1570
450691	RE.F8-200-FBL-N	200	50	236	-	-	-	-	-	-	-	56	-	102	20	3150	3000	1950
450693	RE.F8-080-FBF-N	80	30	107	-	-	-	-	-	-	-	39	120	73	12	1500	1800	700
450695	RE.F8-100-FBF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	1750	2000	800
450697	RE.F8-125-FBF-N	125	38	156	-	-	-	-	-	-	-	37	120	73	12	2000	2200	990
450699	RE.F8-150-FBF-N	150	45	188	-	-	-	-	-	-	-	56	156	102	20	2500	3000	1860
450700	RE.F8-200-FBF-N	200	50	236	-	-	-	-	-	-	-	56	156	102	20	3150	3000	2240
450801	RE.F8-080-PBL-N-SST	80	30	107	100	85	9	75	45	80	60	-	-	-	-	1500	1800	290
450806	RE.F8-100-PBL-N-SST	100	30	128	100	85	9	75	45	80	60	-	-	-	-	1750	2000	360
450811	RE.F8-125-PBL-N-SST	125	40	156	100	85	9	75	45	80	60	-	-	-	-	2000	2200	630
450701	RE.F8-080-SBL-N-SST	80	30	107	100	85	9	75	45	80	60	39	-	-	-	1500	1800	550
450706	RE.F8-100-SBL-N-SST	100	30	128	100	85	9	75	45	80	60	35	-	-	-	1750	2000	610
450711	RE.F8-125-SBL-N-SST	125	40	156	100	85	9	75	45	80	60	37	-	-	-	2000	2200	780
450751	RE.F8-080-SBF-N-SST	80	30	107	100	85	9	75	45	80	60	39	120	-	-	1500	1800	730
450756	RE.F8-100-SBF-N-SST	100	30	128	100	85	9	75	45	80	60	35	120	-	-	1750	2000	760
450761	RE.F8-125-SBF-N-SST	125	40	156	100	85	9	75	45	80	60	37	120	-	-	2000	2200	950
450851	RE.F8-080-FBL-N-SST	80	30	107	-	-	-	-	-	-	-	39	-	73	12	1500	1800	500
450856	RE.F8-100-FBL-N-SST	100	30	128	-	-	-	-	-	-	-	35	-	73	12	1750	2000	610
450861	RE.F8-125-FBL-N-SST	125	38	156	-	-	-	-	-	-	-	37	-	73	12	2000	2200	790
450901	RE.F8-080-FBF-N-SST	80	30	107	-	-	-	-	-	-	-	39	120	73	12	1500	1800	520
450906	RE.F8-100-FBF-N-SST	100	30	128	-	-	-	-	-	-	-	35	120	73	12	1750	2000	760
450911	RE.F8-125-FBF-N-SST	125	38	156	-	-	-	-	-	-	-	37	120	73	12	2000	2200	930

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F8-H

Monolithic wheels with steel sheet bracket for medium-heavy loads

RoHS

3000 - 7300 N

- **Wheel centre body**

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

- **Hub**

Directly made into the centre.

- **Axle set**

Calibrated precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

- **Standard executions**

- **PBL-H**: brakeless wheel with zinc-plated steel fixed bracket for medium-heavy loads.

- **SBL-H**: brakeless wheel with zinc-plated steel turning plate bracket for medium-heavy loads.

- **SBF-H**: wheel with zinc-plated steel turning plate bracket for medium-heavy loads, with brake.

- **Fixed plate bracket**

Yellow zinc-plated steel sheet (test in saline fog chamber above 72h). The bracket is designed to withstand loads up to 7500N. Suitable for heavy industrial applications.

- **Turning plate bracket**

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance. Does not require maintenance.

The bracket is designed to withstand loads up to 7500N. Suitable for heavy industrial applications.

It consists of (see fig. 1):

- 1) fitting plate: yellow zinc-plated steel sheet;
- 2) fork: yellow zinc-plated steel sheet;
- 3) ball race ring: yellow zinc-plated steel sheet;
- 4) central pin: class 8.8 steel screw and steel nut;
- 5) rotation system: dual grease-lubricated ring of balls;
- 6) dust seal: RAL 7015 dark grey technopolymer.

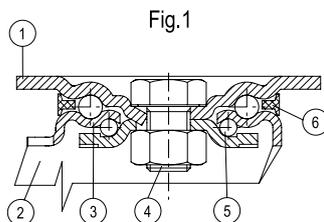
- **Brake**

Front brake (RE.F8-100-125) or rear brake (RE.F8-150-200) dual-effect with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

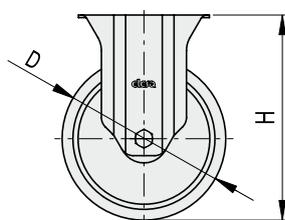
The braking efficacy may be adjusted with a socket head screw M8.

Applications

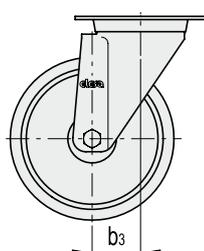
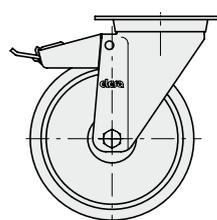
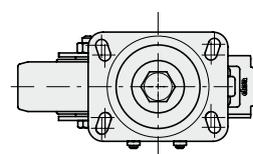
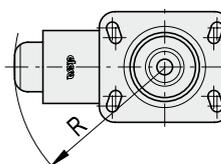
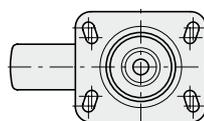
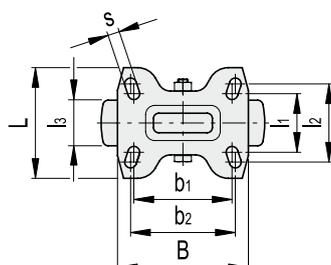
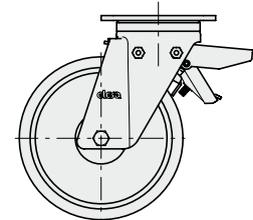
Suitable for heavy industrial applications. Excellent wear and tearing resistance. For further information see RE.F8 (see page 23) wheel.



RE.F8-PBL-H



RE.F8-SBL-H

RE.F8-100-SBF-H
RE.F8-125-SBF-HRE.F8-150-SBF-H
RE.F8-200-SBF-H

Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	⚖	
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	[N]	[N]	g
450951	RE.F8-100-PBL-H	100	30	138	100	85	9	75	45	80	60	46	123	1750	3000	990
450952	RE.F8-125-PBL-H	125	38	161	100	85	9	75	45	80	60	48	123	2000	3500	1160
450953	RE.F8-150-PBL-H	150	45	200	140	110	11	105	73	-	87	70	156	2500	5000	2800
450954	RE.F8-200-PBL-H	200	50	250	140	110	11	105	73	-	87	70	156	4550	7300	3110
450931	RE.F8-100-SBL-H	100	30	138	100	85	9	75	45	80	60	46	123	1750	3000	990
450932	RE.F8-125-SBL-H	125	38	161	100	85	9	75	45	80	60	48	123	2000	3500	1160
450933	RE.F8-150-SBL-H	150	45	200	140	110	11	105	73	-	87	70	156	2500	5000	2800
450934	RE.F8-200-SBL-H	200	50	250	140	110	11	105	73	-	87	70	156	4550	7300	3110
450941	RE.F8-100-SBF-H	100	30	138	100	85	9	75	45	80	60	46	123	1750	3000	990
450942	RE.F8-125-SBF-H	125	38	161	100	85	9	75	45	80	60	48	123	2000	3500	1160
450943	RE.F8-150-SBF-H	150	45	200	140	110	11	105	73	-	87	70	156	2500	5000	2800
450944	RE.F8-200-SBF-H	200	50	250	140	110	11	105	73	-	87	70	156	4550	7300	3110

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.F8-WH

Monolithic wheels with electro-welded steel bracket for heavy loads

RoHS

6500 - 9000 N

• Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

• Hub and axle set

Hub with ball bearings. The axle set is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

• Standard executions

- **PSL-WH**: brakeless wheel with zinc-plated electro-welded steel fixed plate bracket for heavy loads.
- **SSL-WH**: brakeless wheel with zinc-plated electro-welded steel turning plate bracket for heavy loads.
- **SSF-WH**: wheel with zinc-plated electro-welded steel turning plate bracket for heavy loads, with brake.

• Fixed plate bracket

Electrolytically zinc-plated electro-welded steel. The bracket is designed to withstand loads up to 9000N and ensures capacities that make it suitable for heavy industrial applications and for severe conditions of use, as side impact and high speeds.

• Turning plate bracket

The presence of an axial bearing and a conical bearing ensures excellent manoeuvrability also at full load and increases the resistance of the bracket against side impact. It is equipped with lubricator and anti-loosening system of the locking nut.

The bracket is designed to withstand loads up to 9000N. Suitable for heavy industrial applications and for severe conditions of use, as side impact and high speeds.

It consists of (see fig. 1):

- 1) fitting plate: forged steel with built-in pin, electrolytically zinc-plated;
- 2) fork: drawn sides electro-welded to the flange, electrolytically zinc-plated;
- 3) Rotation system: axial ball bearing and conical roller bearing;
- 4) Lubricator;
- 5) Anti-loosening system of the locking nut.

• Rear-actuated brake

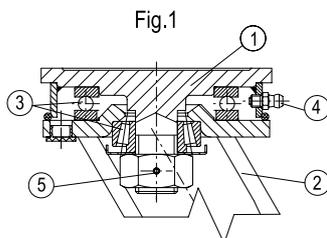
Dual-effect rear brake with simultaneous locking of wheel and bracket. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

The braking efficacy may be adjusted with a socket head screw M8.

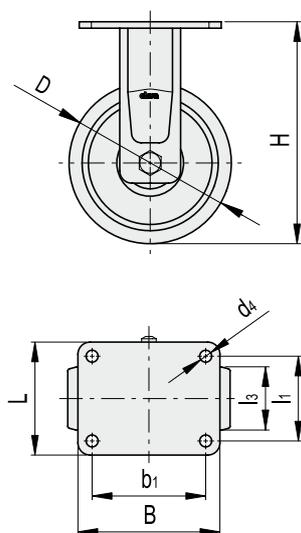
Applications

Suitable for heavy industrial applications, due to loads up to 7500N. The monolithic wheel ensures excellent wear and tearing resistance.

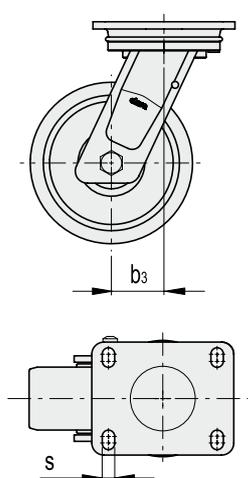
For further information see RE.F8 (see page 23) wheel.



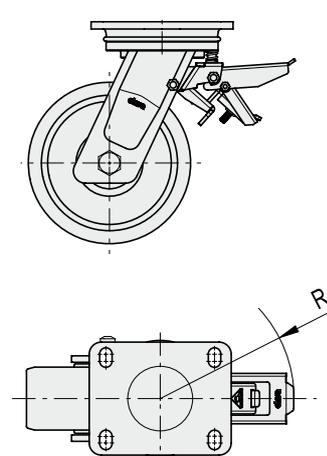
RE.F8-PSL-WH



RE.F8-SSL-WH



RE.F8-SSF-WH



Standard Elements		Main dimensions										Rolling resistance #	Dynamic carrying capacity #	△△	
Code	Description	D	l ₃	H	B	L	b ₁	l ₁	b ₃	R	s	d ₄	[N]	[N]	g
449481	RE.F8-125-PSL-WH	125	45	182	135	110	105	80	51	157	-	11	4000	6500	3510
449482	RE.F8-150-PSL-WH	150	45	210	135	110	105	80	60	157	-	11	4550	7500	3740
449483	RE.F8-200-PSL-WH	200	50	252	135	110	105	80	70	157	-	11	6500	9000	4220
449461	RE.F8-125-SSL-WH	125	45	182	135	110	105	80	51	157	11	-	4000	6500	3510
449462	RE.F8-150-SSL-WH	150	45	210	135	110	105	80	60	157	11	-	4550	7500	3740
449463	RE.F8-200-SSL-WH	200	50	252	135	110	105	80	70	157	11	-	6500	9000	4220
449471	RE.F8-125-SSF-WH	125	45	182	135	110	105	80	51	157	11	-	4000	6500	3510
449472	RE.F8-150-SSF-WH	150	45	210	135	110	105	80	60	157	11	-	4550	7500	3740
449473	RE.F8-200-SSF-WH	200	50	252	135	110	105	80	70	157	11	-	6500	9000	4220

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.G1

Thermoplastic rubber wheels

RoHS

700 - 1800 N

Covering

Grey anti-trace thermoplastic rubber, hardness 85 Shore A.

Wheel centre body

Polypropylene-based technopolymer (PP). Resistant to solvents, oils, greases and other chemical agents.

Hub

Directly made into the centre.

Applications

RE.G1 wheel has excellent rolling resistance and elasticity. See Technical Data on page 56 for selection parameters.

Environmental conditions

RE.G1 wheel is suitable for use in humid environments and in the presence of medium-aggressive chemicals; use in environments with the presence of organic, chlorinated solvents, hydrocarbons and mineral oils is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

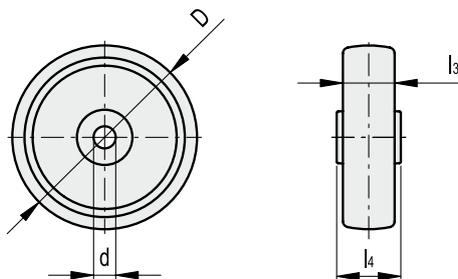
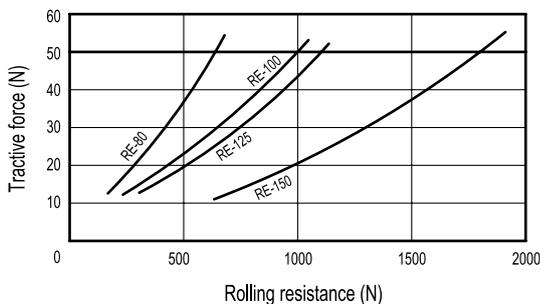
Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.G1 wheels are also supplied with steel sheet bracket (RE.G1-N see page 31).



Standard Elements		Main dimensions				Static load #	Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	d	l ₃	l ₄	[N]	[N]	[N]	g
452501	RE.G1-080-RBL	80	12	30	39	1000	700	700	90
452506	RE.G1-100-RBL	100	12	30	44	1500	1000	1000	120
452511	RE.G1-125-RBL	125	15	35	44	1800	1200	1200	200
452516	RE.G1-150-RBL	150	20	45	59	2700	1800	1800	360

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.G1-N

Thermoplastic rubber wheels with steel sheet bracket

RoHS

700 - 1800 N

• Covering

Grey anti-trace thermoplastic rubber, hardness 85 Shore A.

• Wheel centre body

Polypropylene-based technopolymer (PP). Resistant to solvents, oils, greases and other chemical agents.

• Hub

Directly made into the centre.

• Axle set

Calibrated zinc-plated steel precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

• Standard executions

- **PBL-N**: brakeless wheel with zinc-plated steel fixed plate bracket.
- **SBL-N**: brakeless wheel with zinc-plated steel turning plate bracket.
- **SBF-N**: wheel with zinc-plated steel turning plate bracket, with brake.
- **FBL-N**: brakeless wheel with zinc-plated steel turning plate bracket and centre pass-through hole.
- **FBF-N**: wheel with zinc-plated steel turning plate bracket and centre pass-through hole, with brake.

• Fixed plate bracket

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N.

• Turning plate bracket

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N. The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1). Does not require maintenance.

It consists of:

- 1) fitting plate: electrolytically zinc-plated steel sheet;
- 2) fork: electrolytically zinc-plated steel sheet;
- 3) ball race ring: electrolytically zinc-plated steel sheet;
- 4) central pin: incorporated in the plate, cold reflanged;
- 5) rotation system: dual grease-lubricated ring of ball;
- 6) dust seal: RAL 7015 dark grey technopolymer.

• Front-actuated brake

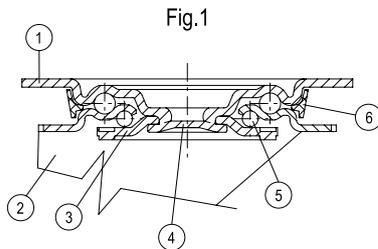
Total brake that locks the wheel and bracket rotation. The optimised dimensions and the retractable pedal ensure minimal space occupied and maximum actuation ease.

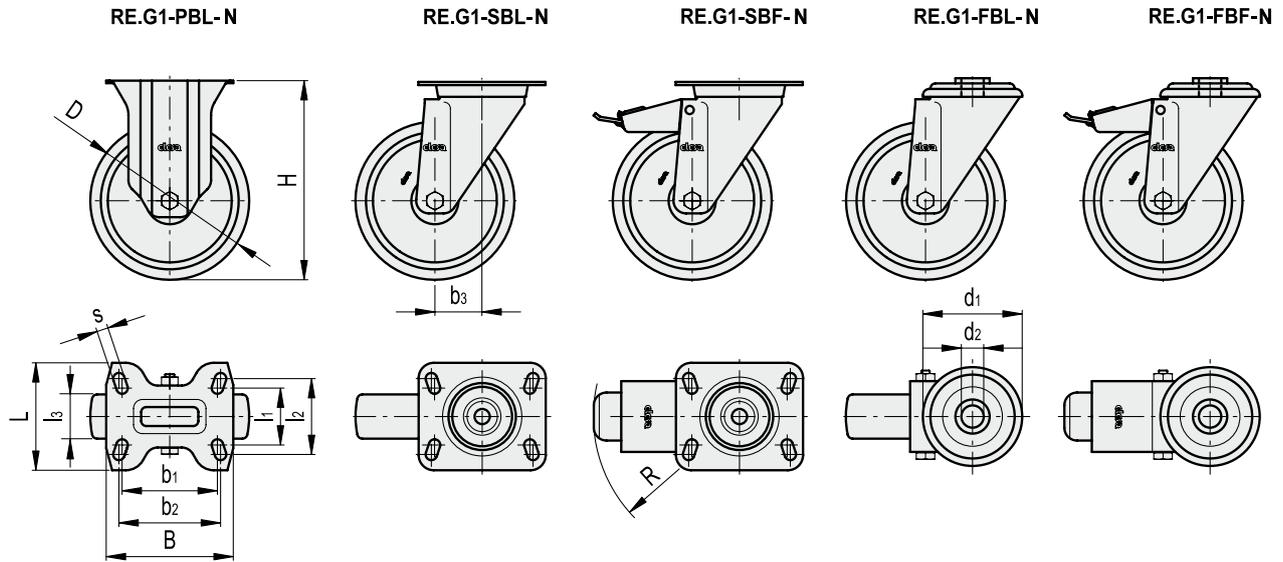
Hardened carbon steel spring.

Applications

Excellent rolling resistance and elasticity.

For further information see RE.G1 (see page 30) wheel.





Standard Elements		Main dimensions													Rolling resistance #	Dynamic carrying capacity #	⚖	
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
452651	RE.G1-080-PBL-N	80	30	107	100	85	9	75	45	80	60	-	-	-	-	700	700	360
452656	RE.G1-100-PBL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	1000	1000	390
452661	RE.G1-125-PBL-N	125	35	156	100	85	9	75	45	80	60	-	-	-	-	1200	1200	610
452666	RE.G1-150-PBL-N	150	45	194	140	114	11	105	73	105	85	-	-	-	-	1800	1800	1350
452551	RE.G1-080-SBL-N	80	30	107	100	85	9	75	45	80	60	39	-	-	-	700	700	600
452556	RE.G1-100-SBL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	1000	1000	700
452561	RE.G1-125-SBL-N	125	35	156	100	85	9	75	45	80	60	37	-	-	-	1200	1200	860
452566	RE.G1-150-SBL-N	150	45	194	140	110	11	105	73	105	87	56	-	-	-	1800	1800	1720
452601	RE.G1-080-SBF-N	80	30	107	100	85	9	75	45	80	60	39	120	-	-	700	700	790
452606	RE.G1-100-SBF-N	100	30	128	100	85	9	75	45	80	60	35	120	-	-	1000	1000	850
452611	RE.G1-125-SBF-N	125	35	156	100	85	9	75	45	80	60	37	120	-	-	1200	1200	1000
452616	RE.G1-150-SBF-N	150	45	194	140	110	11	105	73	105	87	56	156	-	-	1800	1800	2000
452701	RE.G1-080-FBL-N	80	30	107	-	-	-	-	-	-	-	39	-	73	12	700	700	530
452706	RE.G1-100-FBL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	1000	1000	630
452711	RE.G1-125-FBL-N	125	35	156	-	-	-	-	-	-	-	37	-	73	12	1200	1200	800
452716	RE.G1-150-FBL-N	150	45	188	-	-	-	-	-	-	-	56	-	102	20	1800	1800	1580
452751	RE.G1-080-FBF-N	80	30	107	-	-	-	-	-	-	-	39	120	73	12	700	700	710
452756	RE.G1-100-FBF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	1000	1000	840
452761	RE.G1-125-FBF-N	125	35	156	-	-	-	-	-	-	-	37	120	73	12	1200	1200	950
452766	RE.G1-150-FBF-N	150	45	188	-	-	-	-	-	-	-	56	156	102	20	1800	1800	1870

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.E2

Vulkanised rubber wheels



650 - 2250 N

Covering with tread

Vulcanised rubber; hardness 83 Shore A.

Wheel centre body

Polypropylene-based (PP) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

Hub

Directly made into the centre.

Applications

RE.E2 wheel may be mounted on different kind of trolleys, with medium-light loads; it is also suitable for outdoor use.

Typical applications: trolleys for industrial moving, for outdoor use also, waste dumpsters.

See Technical Data on page 56 for selection parameters.

Environmental conditions

Suitable for use in humid environments and in the presence of atmospheric agents; use in environments with the presence of organic, chlorinated solvents, hydrocarbons and mineral oils is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

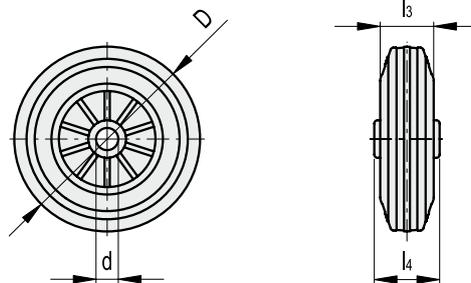
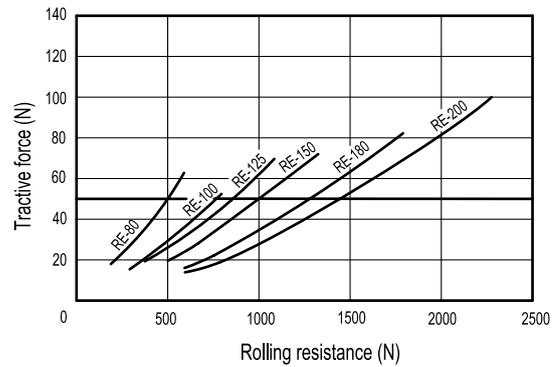
Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.E2 wheels are also supplied with steel sheet bracket (RE.E2-N see page 34).



Standard Elements		Main dimensions				Static load #	Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	d	l ₃	l ₄	[N]	[N]	[N]	g
449501	RE.E2-080-RBL	80	12	25	39	1500	500	650	110
449506	RE.E2-100-RBL	100	12	30	44	2000	750	800	210
449512	RE.E2-125-RBL	125	15	37.5	44	2250	850	1100	410
449516	RE.E2-150-RBL	150	15	40	44	2750	1000	1300	610
449518	RE.E2-180-RBL	180	20	45	59	3500	1300	1800	1020
449522	RE.E2-200-RBL	200	20	50	59	4000	1400	2250	1310

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.E2-N

Vulkanised rubber wheels with steel sheet bracket

RoHS

650 - 2250 N

- **Covering with tread**

Vulcanised rubber; hardness 83 Shore A.

- **Wheel centre body**

Polypropylene-based (PP) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Hub**

Directly made into the centre.

- **Axle set**

Calibrated zinc-plated steel precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

- **Standard executions**

- **PBL-N**: brakeless wheel with zinc-plated steel fixed plate bracket.
- **SBL-N**: brakeless wheel with zinc-plated steel turning plate bracket.
- **SBF-N**: wheel with zinc-plated steel turning plate bracket, with brake.
- **FBL-N**: brakeless wheel with zinc-plated steel turning plate bracket and centre pass-through hole.
- **FBF-N**: wheel with zinc-plated steel turning plate bracket and centre pass-through hole, with brake.

- **Fixed plate bracket**

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N.

- **Turning plate bracket**

Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N. The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1). Does not require maintenance.

It consists of:

- 1) fitting plate: electrolytically zinc-plated steel sheet;
- 2) fork: electrolytically zinc-plated steel sheet;
- 3) ball race ring: electrolytically zinc-plated steel sheet;
- 4) central pin: incorporated in the plate, cold reflanged;
- 5) rotation system: dual grease-lubricated ring of ball;
- 6) dust seal: RAL 7015 dark grey technopolymer.

- **Front-actuated brake**

Total brake that locks the wheel and bracket rotation. The optimised dimensions and the retractable pedal ensure minimal space occupied and maximum actuation ease.

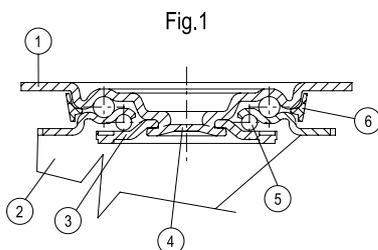
Hardened carbon steel spring.

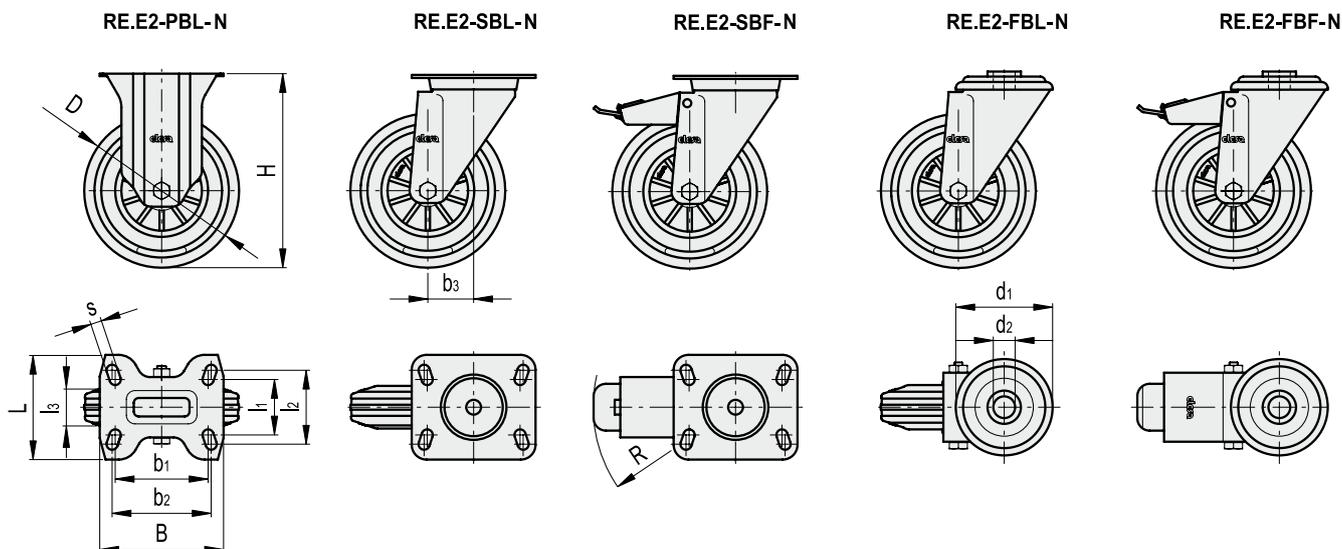
Applications

RE.E2-N wheel may be mounted on different kind of trolleys, with medium-light loads; it is also suitable for outdoor use.

Typical applications: trolleys for industrial moving, for outdoor use also, waste dumpsters.

For further information see RE.E2 (see page 33) wheel.





Standard Elements		Main dimensions														Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
449651	RE.E2-080-PBL-N	80	25	107	100	85	9	75	45	80	60	-	-	-	-	500	650	360
449656	RE.E2-100-PBL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	750	800	480
449661	RE.E2-125-PBL-N	125	37.5	156	100	85	9	75	45	80	60	-	-	-	-	850	1100	710
449666	RE.E2-150-PBL-N	150	40	182	100	85	9	75	45	80	60	-	-	-	-	1000	1300	930
449668	RE.E2-180-PBL-N	180	45	219	140	114	11	105	73	105	85	-	-	-	-	1300	1800	2110
449671	RE.E2-200-PBL-N	200	50	240	140	114	11	105	73	105	85	-	-	-	-	1400	2250	2500
449551	RE.E2-080-SBL-N	80	25	107	100	85	9	75	45	80	60	39	-	-	-	500	650	640
449556	RE.E2-100-SBL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	750	800	730
449561	RE.E2-125-SBL-N	125	37.5	156	100	85	9	75	45	80	60	37	-	-	-	850	1100	1060
449566	RE.E2-150-SBL-N	150	40	182	100	85	9	75	45	80	60	37	-	-	-	1000	1300	1310
449568	RE.E2-180-SBL-N	180	45	219	140	110	11	105	73	105	87	56	-	-	-	1300	1800	2400
449571	RE.E2-200-SBL-N	200	50	240	140	110	11	105	73	105	87	56	-	-	-	1400	2250	2720
449601	RE.E2-080-SBF-N	80	25	107	100	85	9	75	45	80	60	39	120	-	-	500	650	820
449606	RE.E2-100-SBF-N	100	30	128	100	85	9	75	45	80	60	35	120	-	-	750	800	880
449611	RE.E2-125-SBF-N	125	37.5	156	100	85	9	75	45	80	60	37	120	-	-	850	1100	1200
449616	RE.E2-150-SBF-N	150	40	182	100	85	9	75	45	80	60	37	120	-	-	1000	1300	1450
449618	RE.E2-180-SBF-N	180	45	219	140	110	11	105	73	105	87	56	156	-	-	1300	1800	2690
449621	RE.E2-200-SBF-N	200	50	240	140	110	11	105	73	105	87	56	156	-	-	1400	2250	3000
449701	RE.E2-080-FBL-N	80	25	107	-	-	-	-	-	-	-	39	-	73	12	500	650	550
449706	RE.E2-100-FBL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	750	800	680
449711	RE.E2-125-FBL-N	125	37.5	156	-	-	-	-	-	-	-	37	-	73	12	850	1100	960
449716	RE.E2-150-FBL-N	150	40	182	-	-	-	-	-	-	-	37	-	73	12	1000	1300	1250
449718	RE.E2-180-FBL-N	180	45	214	-	-	-	-	-	-	-	56	156	102	20	1300	1800	2280
449721	RE.E2-200-FBL-N	200	50	236	-	-	-	-	-	-	-	56	156	102	20	1400	2250	2620
449751	RE.E2-080-FBF-N	80	25	107	-	-	-	-	-	-	-	39	120	73	12	500	650	680
449756	RE.E2-100-FBF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	750	800	750
449761	RE.E2-125-FBF-N	125	37.5	156	-	-	-	-	-	-	-	37	120	73	12	850	1100	1100
449766	RE.E2-150-FBF-N	150	40	182	-	-	-	-	-	-	-	37	120	73	12	1000	1300	1390
449768	RE.E2-180-FBF-N	180	45	214	-	-	-	-	-	-	-	56	156	102	20	1300	1800	2570
449771	RE.E2-200-FBF-N	200	50	236	-	-	-	-	-	-	-	56	156	102	20	1400	2250	2910

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.E3

Vulkanised rubber wheels

RoHS

650 - 2300 N

Covering with tread

Vulcanised rubber; hardness 83 Shore A.

Wheel centre body

Consisting of two zinc-plated and riveted sheet disks.

Hub

Polyamide-based technopolymer (PA) boss. Resistant to solvents, oils, greases and other chemical agents.

Applications

RE.E3 wheel may be mounted on different kind of trolleys, with medium-light loads; it is also suitable for outdoor use.

Typical applications: trolleys for industrial moving, for outdoor use also, waste dumpsters.

See Technical Data on page 56 for selection parameters.

Environmental conditions

Suitable for use in humid environments and in the presence of atmospheric agents; use in environments with the presence of organic, chlorinated solvents, hydrocarbons and mineral oils is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, 200N = 50N x 4 wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

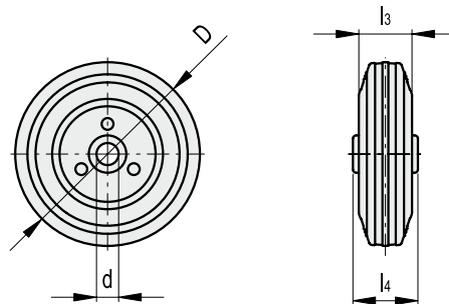
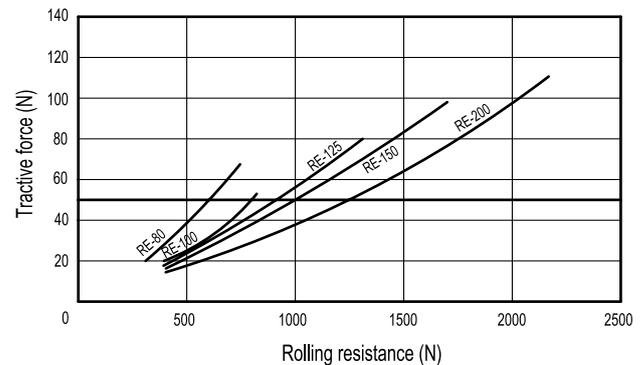
Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.E3 wheels are also supplied with steel sheet bracket (RE.E3-N see page 37).



Standard Elements		Main dimensions				Static load #	Rolling resistance #	Dynamic carrying capacity #	$\Delta^{\circ}\Delta$
Code	Description	D	d	l ₃	l ₄	[N]	[N]	[N]	g
450001	RE.E3-080-RBL	80	12	25	39	2600	600	650	170
450006	RE.E3-100-RBL	100	12	30	44	3000	750	800	280
450012	RE.E3-125-RBL	125	15	37.5	44	3300	850	1300	510
450016	RE.E3-150-RBL	150	15	40	44	3500	1000	1700	730
450022	RE.E3-200-RBL	200	20	50	58	4100	1400	2300	1750

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.E3-N

Vulcanised rubber wheels with steel sheet bracket

RoHS

650 - 2300 N

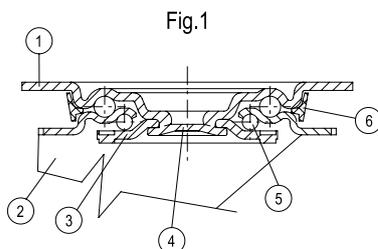
- **Covering with tread**
Vulcanised rubber; hardness 83 Shore A.
- **Wheel centre body**
Consisting of two zinc-plated and riveted sheet disks.
- **Hub**
Polyamide-based technopolymer (PA) boss. Resistant to solvents, oils, greases and other chemical agents.
- **Axle set**
Calibrated zinc-plated steel precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.
The wheel hub rotates onto the tube freely.
- **Standard executions** (hub with boss)
 - **PBL-N**: brakeless wheel with zinc-plated steel fixed plate bracket.
 - **SBL-N**: brakeless wheel with zinc-plated steel turning plate bracket.
 - **SBF-N**: wheel with zinc-plated steel turning plate bracket, with brake.
 - **FBL-N**: brakeless wheel with zinc-plated steel turning plate bracket and centre pass-through hole.
 - **FBF-N**: wheel with zinc-plated steel turning plate bracket and centre pass-through hole, with brake.
- **Fixed plate bracket**
Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N.
- **Turning plate bracket**
Zinc-plated steel sheet, the bracket is designed to withstand loads up to 3000N. The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance (see fig. 1). Does not require maintenance.
It consists of:
 - 1) fitting plate: electrolytically zinc-plated steel sheet;
 - 2) fork: electrolytically zinc-plated steel sheet;
 - 3) ball race ring: electrolytically zinc-plated steel sheet;
 - 4) central pin: incorporated in the plate, cold reflanged;
 - 5) rotation system: dual grease-lubricated ring of balls;
 - 6) dust seal: RAL 7015 dark grey technopolymer.
- **Front-actuated brake**
Total brake that locks the wheel and bracket rotation. The optimised dimensions and the retractable pedal ensure minimal space occupied and maximum actuation ease.
Hardened carbon steel spring.

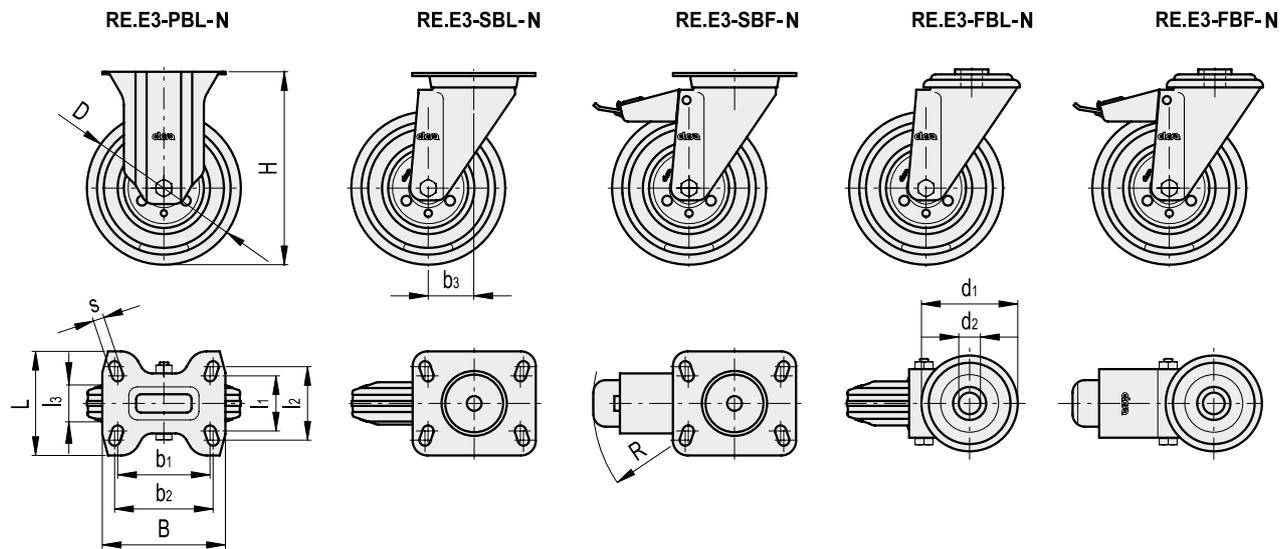
Applications

RE.E3-N wheel may be mounted on different kind of trolleys, with medium-light loads; it is also suitable for outdoor use.

Typical applications: trolleys for industrial moving, for outdoor use also, waste dumpsters.

For further information see RE.E3 (see page 36) wheel.





Standard Elements		Main dimensions														Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d ₁	d ₂	[N]	[N]	g
450151	RE.E3-080-PBL-N	80	25	107	100	85	9	75	45	80	60	-	-	-	-	600	650	490
450156	RE.E3-100-PBL-N	100	30	128	100	85	9	75	45	80	60	-	-	-	-	750	800	620
450161	RE.E3-125-PBL-N	125	37.5	156	100	85	9	75	45	80	60	-	-	-	-	850	1300	920
450166	RE.E3-150-PBL-N	150	40	182	100	85	9	75	45	80	60	-	-	-	-	1000	1700	1220
450171	RE.E3-200-PBL-N	200	50	240	140	114	11	105	73	105	85	-	-	-	-	1400	2300	2890
450051	RE.E3-080-SBL-N	80	25	107	100	85	9	75	45	80	60	39	-	-	-	600	650	690
450056	RE.E3-100-SBL-N	100	30	128	100	85	9	75	45	80	60	35	-	-	-	750	800	820
450061	RE.E3-125-SBL-N	125	37.5	156	100	85	9	75	45	80	60	37	-	-	-	850	1300	1180
450066	RE.E3-150-SBL-N	150	40	182	100	85	9	75	45	80	60	37	-	-	-	1000	1700	1400
450071	RE.E3-200-SBL-N	200	50	240	140	110	11	105	73	105	87	56	-	-	-	1400	2300	3250
450101	RE.E3-080-SBF-N	80	25	107	100	85	9	75	45	80	60	39	120	-	-	600	650	870
450106	RE.E3-100-SBF-N	100	30	128	100	85	9	75	45	80	60	35	120	-	-	750	800	1000
450111	RE.E3-125-SBF-N	125	37.5	156	100	85	9	75	45	80	60	37	120	-	-	850	1300	1300
450116	RE.E3-150-SBF-N	150	40	182	100	85	9	75	45	80	60	37	120	-	-	1000	1700	1570
450121	RE.E3-200-SBF-N	200	50	240	140	110	11	105	73	105	87	56	156	-	-	1400	2300	3390
450201	RE.E3-080-FBL-N	80	25	107	-	-	-	-	-	-	-	39	-	73	12	600	650	610
450206	RE.E3-100-FBL-N	100	30	128	-	-	-	-	-	-	-	35	-	73	12	750	800	740
450211	RE.E3-125-FBL-N	125	37.5	156	-	-	-	-	-	-	-	37	-	73	12	850	1300	1090
450216	RE.E3-150-FBL-N	150	40	182	-	-	-	-	-	-	-	37	-	73	12	1000	1700	1350
450221	RE.E3-200-FBL-N	200	50	236	-	-	-	-	-	-	-	56	-	102	20	1400	2300	3160
450251	RE.E3-080-FBF-N	80	25	107	-	-	-	-	-	-	-	39	120	73	12	600	650	780
450256	RE.E3-100-FBF-N	100	30	128	-	-	-	-	-	-	-	35	120	73	12	750	800	940
450261	RE.E3-125-FBF-N	125	37.5	156	-	-	-	-	-	-	-	37	120	73	12	850	1300	1240
450266	RE.E3-150-FBF-N	150	40	182	-	-	-	-	-	-	-	37	120	73	12	1000	1700	1490
450271	RE.E3-200-FBF-N	200	50	236	-	-	-	-	-	-	-	56	156	102	20	1400	2300	3290

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.G2

Elastic rubber wheels

RoHS

1800 - 5000 N

• Covering

Elastic rubber, hardness 85 Shore A.

• Wheel centre body

Die-cast aluminium.

• Hub

Hub with ball bearings. Ideal solution for heavy loads and continuous moving.

Applications

The wheel RE.G2 has good wear and tearing resistance. See Technical Data on page 56 for selection parameters.

Environmental conditions

RE.G2 wheel is suitable for use in humid environments and in the presence of medium-aggressive chemicals; use in environments with the presence of organic, chlorinated solvents, hydrocarbons and mineral oils is not recommended.

Rolling resistance - force / load applied

The diagram shows the force to be applied to a wheel to keep it moving at the constant speed of 4 km/h, according to the applied load.

The intersection point with a 50N value is the maximum transportable load with a manually actuated 4-wheel trolley; in fact, $200N = 50N \times 4$ wheels is the maximum force that may be supported by the operator according to the regulations in force regarding work safety.

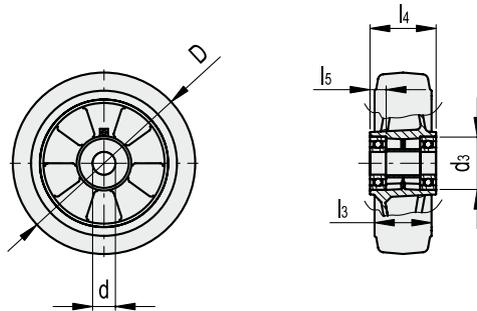
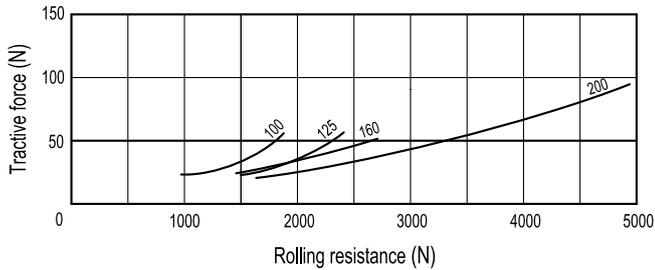
Mechanical moving with towing devices

For mechanical towing, please see the technical specifications to determine the capacity variation.

Temperature

If operating temperatures in an application differ from the standard range of values, please see the technical specifications to determine the capacity variation.

RE.G2 wheels are also supplied with steel sheet bracket for medium-heavy loads (RE.G2-H see page 40).



Standard Elements		Main dimensions						Static load #	Rolling resistance #	Dynamic carrying capacity #	△
Code	Description	D	d	d3	l3	l4	l5	[N]	[N]	[N]	g
452771	RE.G2-100-RSL	100	15	32	40	40	9	2500	1800	1800	440
452772	RE.G2-125-RSL	125	20	47	50	59	14	3200	2300	2300	840
452773	RE.G2-160-RSL	160	20	47	50	59	14	4200	3000	3000	1220
452774	RE.G2-200-RSL	200	20	52	50	60	17.5	10000	3000	5000	2000

See Technical Data on page 51 for static load, rolling resistance and dynamic carrying capacity.

RE.G2-H

Elastic rubber wheels with steel sheet bracket for medium-heavy loads

RoHS

1800 - 5000 N

- **Covering**

Elastic rubber, hardness 85 Shore A.

- **Wheel centre body**

Die-cast aluminium.

- **Hub and axle**

Hub with ball bearings. The axle is mounted using a calibrated tube processed to obtain an even surface where ball bearings and spacers are inserted. Screw and nut are tightened to lock the spacer and the ball bearings. Ideal solution for heavy loads and continuous moving.

- **Standard executions**

- **PSL-H**: brakeless wheel with zinc-plated steel fixed plate bracket for medium-heavy loads.
- **SSL-H**: brakeless wheel with zinc-plated steel turning plate bracket for medium-heavy loads.
- **SSF-H**: wheel with zinc-plated steel turning plate bracket for medium-heavy loads, with brake.

- **Fixed plate bracket**

Yellow zinc-plated steel sheet (test in saline fog chamber above 72h). The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications.

- **Turning plate bracket**

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance. Does not require maintenance.

The bracket is designed to withstand loads up to 7500N and ensures capacities that make it suitable for heavy industrial applications (see fig. 1). It consists of:

- 1) fitting plate: yellow zinc-plated steel sheet;
- 2) fork: yellow zinc-plated steel sheet;
- 3) ball race ring: yellow zinc-plated steel sheet;
- 4) central pin: class 8.8 steel screw and steel nut;
- 5) rotation system: dual grease-lubricated ring of balls;
- 6) dust seal: RAL 7015 dark grey technopolymer.

- **Rear-actuated brake**

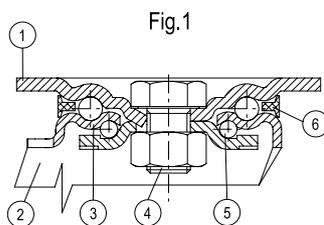
Dual-effect rear brake with simultaneous locking of wheel and bracket. The trolley must be turned to use the device. The brake is simple and effective to use: it is actuated and released by a simple action from the top downward at the tip of two separate pedals, thus ensuring the utmost manoeuvring comfort.

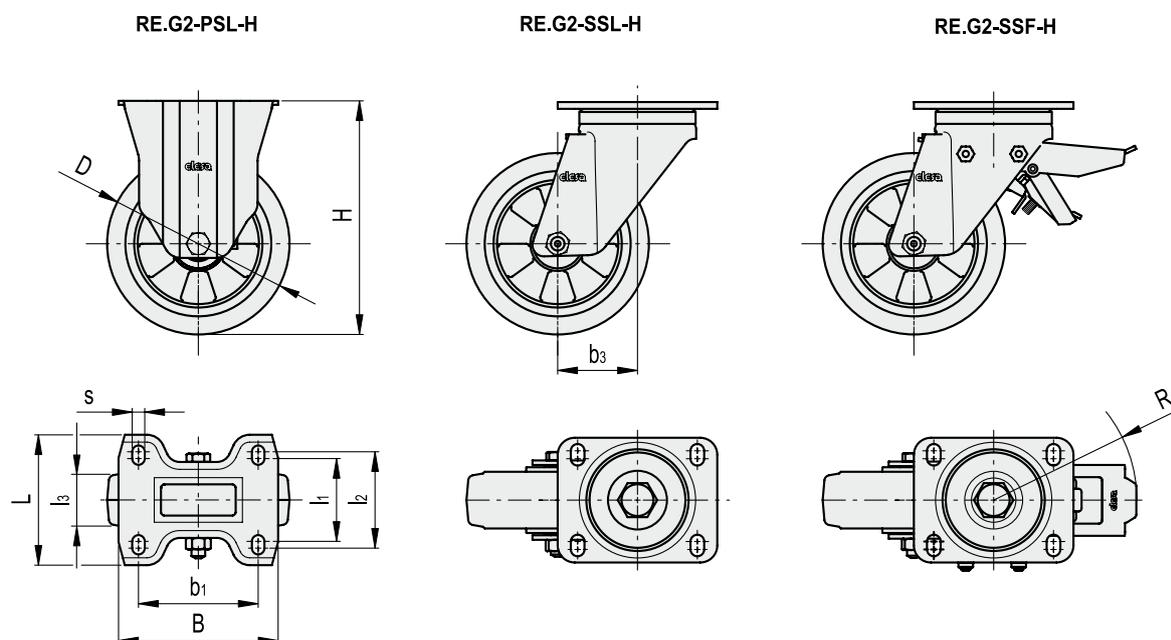
The braking efficacy may be adjusted with a socket head screw M8.

Applications

Wear and tearing resistance.

For further information see RE.G2 (see page 39) wheel.





Standard Elements		Main dimensions											Rolling resistance #	Dynamic carrying capacity #	⚖
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	l ₂	b ₃	R	[N]	[N]	g
452785	RE.G2-100-PSL-H	100	40	138	100	85	9	80	60	-	46	-	1800	1800	1310
452786	RE.G2-125-PSL-H	125	50	170	140	110	11	105	73	85	70	-	2300	2300	2300
452787	RE.G2-160-PSL-H	160	50	205	140	110	11	105	73	87	70	126	3000	3000	3570
452788	RE.G2-200-PSL-H	200	50	250	140	110	11	105	73	87	70	126	3000	5000	4460
452775	RE.G2-100-SSL-H	100	40	138	100	85	9	80	60	-	46	-	1800	1800	1310
452776	RE.G2-125-SSL-H	125	50	170	140	110	11	105	73	85	70	-	2300	2300	2300
452777	RE.G2-160-SSL-H	160	50	205	140	110	11	105	73	87	70	126	3000	3000	3570
452778	RE.G2-200-SSL-H	200	50	250	140	110	11	105	73	87	70	126	3000	5000	4460
452781	RE.G2-160-SSF-H	160	50	205	140	110	11	105	73	87	70	126	3000	3000	3570
452782	RE.G2-200-SSF-H	200	50	250	140	110	11	105	73	87	70	126	3000	5000	4460

See Technical Data on page 51 for rolling resistance and dynamic carrying capacity.

RE.C7

Vulkanised rubber wheels for the general public

RoHS

350 - 550 N

• Covering

Grey anti-trace vulkanised natural rubber.

• Wheel centre body

Polyamide-based technopolymer (PA). Resistant to solvents, oils, greases and other chemical agents.

• Hub

Directly made into the centre.

• Axle set

Calibrated zinc-plated steel precision tube. The tube serves as a spacer, is tightened to the bracket with screw and nut to a un predetermined torque value.

The wheel hub rotates onto the tube freely.

• Standard executions

- **PBL**: brakeless wheel with zinc-plated steel fixed plate bracket.
- **SBL**: brakeless wheel with zinc-plated steel turning plate bracket.
- **SBF**: wheel with zinc-plated steel turning plate bracket, with brake.
- **CBL**: brakeless wheel with zinc-plated steel turning plate bracket and centre pin.
- **CBF**: wheel with zinc-plated steel turning plate bracket and centre pin, with brake.
- **FBL**: brakeless wheel with zinc-plated steel turning plate bracket with centre pass-through hole.
- **FBF**: wheel with zinc-plated steel turning plate bracket and centre pass-through hole, with brake.

• Fixed plate bracket

Electrolytically zinc-plated steel sheet bracket.

• Turning plate bracket

The presence of two ball turns and the direct contact between the plate and the ball race ring with built-in pin ensure excellent manoeuvrability and very limited clearance.

• Front-actuated brake

Brake that locks the wheel rotation. The optimised dimensions and the retractible pedal ensure minimal space occupied and maximum actuation ease.

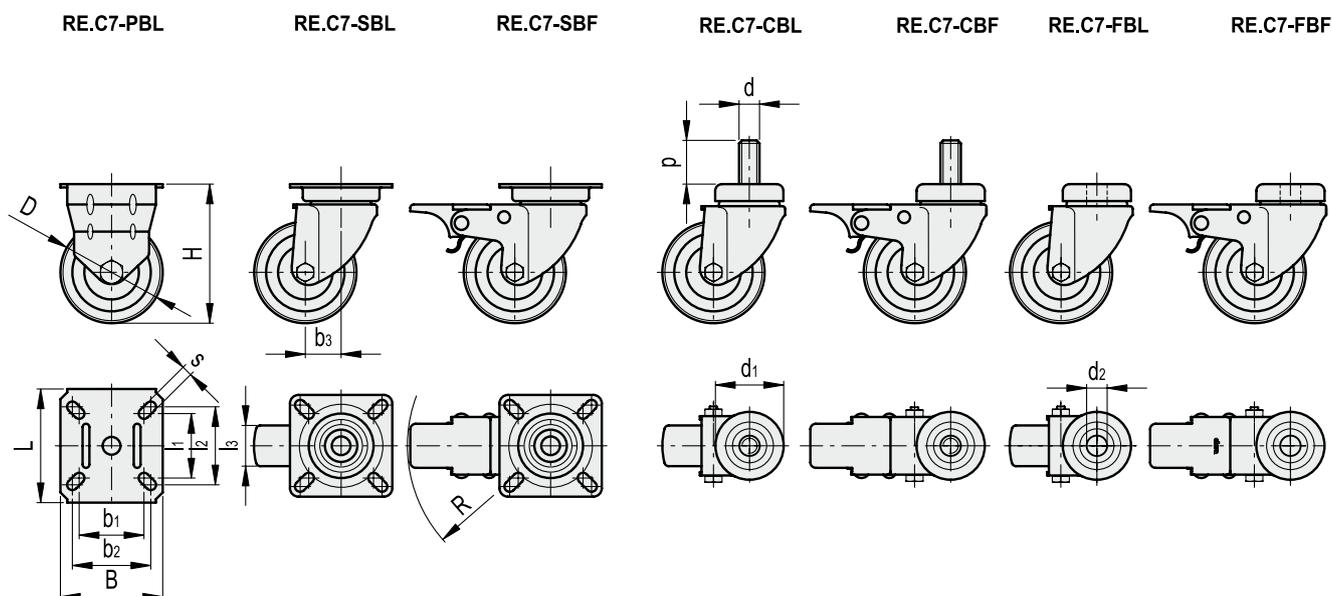
Applications

Wheels for the general public, excellent rolling resistance and elasticity.

Environmental conditions

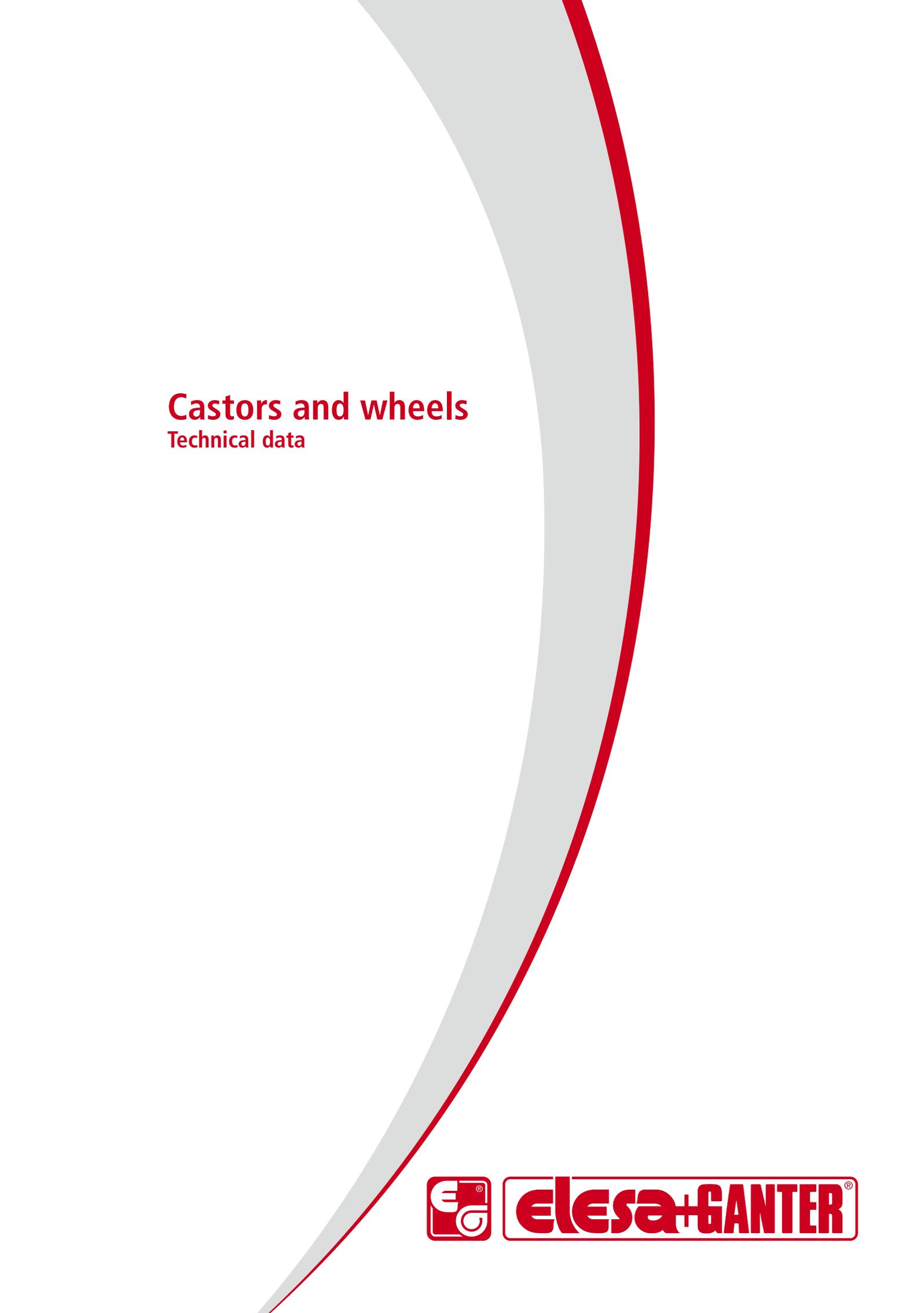
RE.C7 wheel is suitable for use in humid environments and in the presence of medium-aggressive chemical environments; use in environments with the presence of organic, chlorinated solvents, hydrocarbons and mineral oils is not recommended.





Standard Elements		Main dimensions														Dynamic carrying capacity #	Δ		
Code	Description	D	l ₃	H	B	L	s	b ₁	l ₁	b ₂	l ₂	b ₃	R	d	p	d ₁	d ₂	[N]	g
452101	RE.C7-050-PBL	50	20	67	55	55	6	38.5	38.5	44	44	-	-	-	-	-	-	350	200
452106	RE.C7-060-PBL	60	24	83	60	60	6	38	38	48	48	-	-	-	-	-	-	500	260
452111	RE.C7-080-PBL	80	24	104	60	60	6	38	38	48	48	-	-	-	-	-	-	550	340
452001	RE.C7-050-SBL	50	20	67	55	55	6	38.5	38.5	44	44	24	-	-	-	-	-	350	200
452006	RE.C7-060-SBL	60	24	83	60	60	6	38	38	48	48	21	-	-	-	-	-	500	280
452011	RE.C7-080-SBL	80	24	104	60	60	6	38	38	48	48	30	-	-	-	-	-	550	430
452051	RE.C7-050-SBF	50	20	67	55	55	6	38.5	38.5	44	44	24	76	-	-	-	-	350	240
452056	RE.C7-060-SBF	60	24	83	60	60	6	38	38	48	48	21	84	-	-	-	-	500	400
452061	RE.C7-080-SBF	80	24	104	60	60	6	38	38	48	48	30	91	-	-	-	-	550	500
452151	RE.C7-050-CBL	50	20	66	-	-	-	-	-	-	-	24	-	M8	15	35	-	350	180
452156	RE.C7-060-CBL	60	24	83	-	-	-	-	-	-	-	21	-	M12	25	41	-	500	290
452161	RE.C7-080-CBL	80	24	104	-	-	-	-	-	-	-	25	-	M12	25	41	-	550	390
452201	RE.C7-050-CBF	50	20	66	-	-	-	-	-	-	-	24	76	M8	15	35	-	350	210
452206	RE.C7-060-CBF	60	24	83	-	-	-	-	-	-	-	21	84	M12	25	41	-	500	360
452211	RE.C7-080-CBF	80	24	104	-	-	-	-	-	-	-	25	91	M12	25	41	-	550	460
452251	RE.C7-050-FBL	50	20	66	-	-	-	-	-	-	-	24	-	-	-	35	10	350	160
452256	RE.C7-060-FBL	60	24	83	-	-	-	-	-	-	-	21	-	-	-	41	12	500	250
452261	RE.C7-080-FBL	80	24	104	-	-	-	-	-	-	-	25	-	-	-	41	12	550	340
452301	RE.C7-050-FBF	50	20	66	-	-	-	-	-	-	-	24	76	-	-	35	10	350	190
452306	RE.C7-060-FBF	60	24	83	-	-	-	-	-	-	-	21	84	-	-	41	12	500	320
452311	RE.C7-080-FBF	80	24	104	-	-	-	-	-	-	-	25	91	-	-	41	12	550	430

See Technical Data on page 51 for dynamic carrying capacity.



Castors and wheels

Technical data



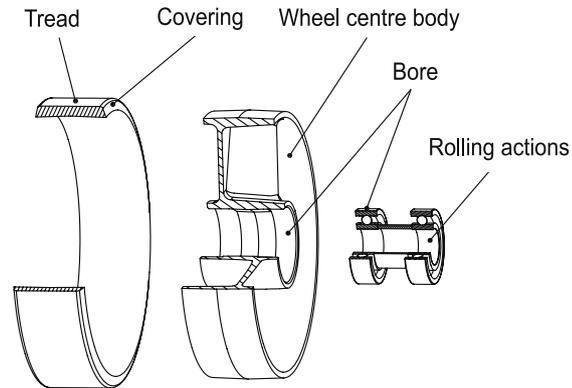
elessa+GANTER®

1. GENERAL INFORMATION

The wheel is a mechanical assembly in which sliding motion is replaced by rolling motion through rotation around an axis.

The wheel consists of the following components:

the tread, the covering, the wheel centre body, the bore and the rolling action.



- **Tread**

The tread is the wheel's outer surface, i.e. the part that comes in contact with the ground. It can be smooth or engraved with raised patterns to increase its grip on the ground.

- **Covering**

The covering, or rolling strip, is the outer ring. It is made of different materials and characterises the wheel. The covering is fixed when joined with the wheel centre body as a single solid piece (using an adhesive or through a mechanical connection) or fitted when mechanically assembled on the wheel centre body.

- **Wheel centre body**

The wheel centre body is the wheel part that connects the covering to the bore. It comes in various shapes and is made of different materials; it can be a single piece or two or more parts joined together.

- **Bore and rolling actions**

The bore is the middle part of the wheel that houses the axle or the rolling actions that make rotation easier (ball bearings, roller bearings, plain bearings, etc.).

Depending on the construction methods and materials forming the covering, wheels can be divided into three families: rubber wheels, polyurethane wheels and monolithic (or hard tread) wheels.

1.1 Rubber wheels

A rubber wheel covering consists of an elastomer made from natural and/or synthesised rubber. The rubber used to build industrial wheels can be vulcanised or injection moulded.

Vulcanised rubber: special mineral loads and vulcanising agents are added to the rubber that undergoes a process called "vulcanising".

During this process, the rubber's molecular structure changes significantly: the "pasty" material at the beginning of the process becomes a non-fusible product that acquires and, over time, maintains the form of the mould in which the reaction occurs. The ring obtained is mechanically assembled to the wheel centre body. Vulcanised rubber has enhanced elastic deformability properties within relatively broad ranges of applied traction and compression loads.

The physical-mechanical characteristics of vulcanised rubber vary according to the quality of the natural and/or synthesised rubber used, the type and quantity of mineral loads added and the conditions under which the vulcanisation process takes place.

Injected rubber: the rubber goes through a chemical synthesis process. The material obtained is injected into a mould in which the wheel centre body has already been inserted. The injected rubber maintains its fusibility even after moulding.

Normally, the elastic properties of injected rubber are worse than those of the best quality vulcanised rubber, even though they are comparable to those of medium and low-quality vulcanised rubber. The following are some of the main physical-mechanical parameters relative to the quality of rubber (for the definition of each parameter see the standards indicated next to that parameter):

- hardness UNI EN ISO 868:1999; ASTM D 2240-2004
- specific density UNI 7092:1972; ISO 2781:1988
- impact strength UNI 7716:2000; ISO 4662:1986
- abrasion loss UNI 9185:1988; DIN 53516:1987
- ultimate tensile strength UNI 6065:2001; ISO 37:1994; ASTM D 412c-1998
- ultimate elongation UNI 6065:2001; ISO 37:1994; ASTM D 412c-1998
- tearing resistance UNI 4914:1987; ASTM D 624b-2000
- compression set UNI ISO 815:2001

These parameters are not independent; in other words, changing one of them usually leads to a change in other parameters (to varying degrees). Hardness is the easiest parameter to determine: in general, increased hardness reduces the elastic properties (impact strength, ultimate elongation, compression set) and lowers overall wheel performances. Instead, parameters such as tearing resistance and abrasion loss depend mainly on the composition of the vulcanised rubber and, to a lesser extent, on hardness.

1.2 Polyurethane wheels

A polyurethane wheel covering consists of an elastomer obtained exclusively from the synthesis of raw materials.

Polyurethanes are chemical compounds obtained from a polymerisation reaction triggered by mixing two components, belonging to two different families of compounds (Di-Isocyanates and Polyalcohols), that were previously heated to temperatures that keep them in the liquid state with relatively low viscosity. In general, elastomer polyurethanes do not contain any additional mineral loads. The reactive mix is cast or injected into heated moulds containing the metal or plastic centres. Thanks to the temperature of the mould and of the wheel centre body, the polymerisation reaction can be completed inside the polyurethane, while the polyurethane is chemically linked to any adhesive that may be present on the surface of the wheel centre body.

Mould-on polyurethane is no longer fusible, has good elasticity characteristics in addition to medium-high hardness and compression and traction strength.

Injected polyurethane is fusible even after moulding; in general, it has inferior elasticity characteristics but superior hardness with respect to mould-on polyurethane.

The following are some of the main physical-mechanical characteristics of polyurethane (for the definition of each characteristic see the standards indicated next to that parameter):

- hardness UNI EN ISO 868:1999; ASTM D 2240-2004
- specific density UNI 7092:1972; ISO 2781:1988
- impact strength UNI 7716:2000; ISO 4662:1986
- abrasion loss UNI 9185:1988; DIN 53516:1987
- ultimate tensile strength UNI 6065:2001; ISO 37:1994; ASTM D 412c-1998
- ultimate elongation UNI 6065:2001; ISO 37:1994; ASTM D 412c-1998
- tearing resistance UNI 4914:1987; ASTM D 624b-2000
- compression set UNI ISO 815:2001

1.3 Monolithic (hard tread) wheels

In monolithic (hard tread) wheels, the wheel centre body and the covering are made with the same material. The physical-mechanical characteristics of the wheel will change depending on the material used.

2. BRACKETS

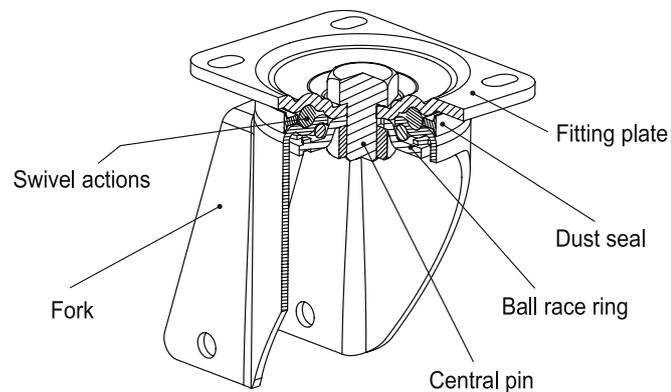
2.1 Swivel bracket

The bracket is the part that connects the wheel to the equipment. Normally, all wheels need a bracket to be applied to the equipment; an exception is made for wheels whose axle is built into the equipment. Brackets can be the swivel or the fixed type.

ELESA+GANTER wheels are coupled to various types of bracket made out of zinc-plated steel sheet, AISI 304 stainless steel or electro-welded steel described in detail in the respective product data sheets. The description of the brackets made out of steel sheet follows by way of example.

The swivel bracket rotates around its own vertical axis as the running direction changes. The wheel axis is misaligned with respect to the bracket axis so that it is easier to manoeuvre the equipment. "Manoeuvrability" is defined as the ability of the equipment to change direction, while "directionality" refers to the equipment's ability to maintain a trajectory along a specific direction. Excessive offset reduces equipment directionality due to "sliding" of the wheel (the "Swimmy" effect).

Swivel brackets can also be equipped with brakes. The swivel bracket consists of a connecting plate, a fork, a ball race ring, swivel actions, a central pin and, if necessary, a dust seal.



- **Fitting plate**

The fitting plate is used to connect the bracket to the equipment (four connection holes).

- **Wheel support fork**

The fork is the piece with the characteristic upside-down "U" shape that supports the wheel. Holes are drilled at the bottom to house the wheel's axle set, while the swivel actions are inserted in the top.

- **Ball race ring**

The ball race ring contains the castor's swivel actions. In special cases, it can also be used only as a dust seal or a guard.

- **Swivel actions**

Swivel actions allow the plate to rotate on the fork. They consist of a ring of balls in contact between the plate and the fork (called "ball gyro") lubricated with grease to protect against dust, liquids and other aggressive agents. The bracket load capacity varies significantly according to the type of swivel action being used.

- **Central pin**

The central pin is the part that joins the plate and the ball race ring. Thanks to the central pin, the plate and the ball race ring form a single piece, while the fork is free to rotate around its own axis. The pin can:

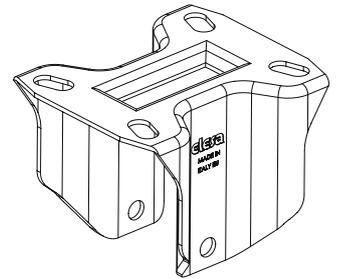
- be incorporated in the plate, through forming and riveting after assembling the parts;
- be incorporated in the plate, through hot forming on the plate and tightening with a self-locking nut;
- consist of a screw and a nut.

- **Dust seal**

The dust seal protects the swivel actions of the bracket against dust and solid and medium-grain aggressive agents.

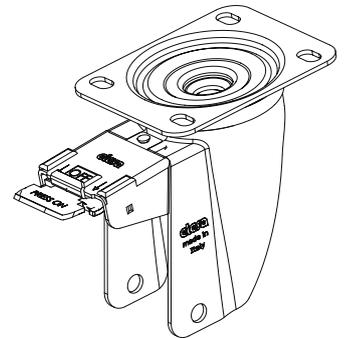
2.2 Fixed bracket

The fixed bracket is designed to keep the wheel moving in a specific direction; therefore, it guarantees equipment directionality. Instead, equipment manoeuvrability depends on the use of swivel brackets. In general, the fixed bracket consists of a single pressed steel plate shaped into an upside-down "U". Holes to house the wheel axle set are drilled at the bottom, while the equipment attachment holes are at the top.



2.3 Swivel bracket with brake

The brake is the device that allows the blocking of the rotation of the bracket around its axis, of the rotation of the wheel and of the rotation of the castor (wheel+bracket assembly).



3. AXLE SET

The axle set is the piece used to connect the wheel to the castor. Normally, it consists of a threaded pin with nut, washers, tube and, where necessary, spacers. For standard applications, the axle set can be riveted directly on the castor fork.

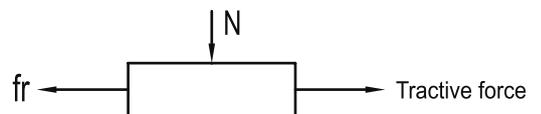
4. LOADS, FRICTION AND FORCES

4.1 Sliding friction

Dissipative forces or friction occur along the contact surfaces between bodies and tend to oppose the movement.

Sliding friction force opposes the movement between two contact surfaces that slide against each other.

This force depends on the type of contact surfaces (materials and finishing level) and on the load applied in the direction perpendicular to the motion direction (Normal force).



In mathematical terms, the sliding friction force is defined as follows:

$$F_r = b_r \times N$$

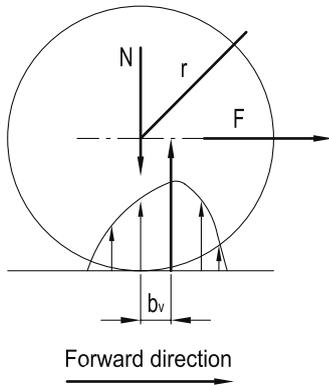
where: b_r = sliding friction coefficient N = normal force (or load)

If two bodies are initially stationary, the resistance force is called the static friction force and represents the minimum force that must be applied to start moving the two bodies.

When the two bodies are in relative motion, a force lower than the static friction force is sufficient to keep the speed constant: this is called the dynamic friction force.

The friction coefficient is obtained experimentally for both static friction and dynamic friction.

4.2 Rolling friction



Rolling friction force is generated when two bodies roll on each other without sliding.

Let's imagine a wheel with **radius r** subjected to a **load N**. As the wheel approaches the contact point, the material is compressed and afterwards, once the contact point has been surpassed, undergoes an elastic release.

If the material used to manufacture the wheel is not perfectly elastic, some of the energy required for compression is lost in the subsequent return phase – dissipated in the form of heat to counteract internal frictional resistance of the material.

If we think in terms of forces, instead of energies, we could say that the distribution of pressure in the contact is not symmetrical compared to the direction of force N.

$$M_r = b_v \times N$$

To keep the wheel turning evenly it is necessary to apply a motive moment identical to and opposite **M_r** or a **traction force F** parallel to the forward direction and such that:

$$F \times r = M_r$$

From the previous formulas we obtained:

$$F = \frac{M_r}{r} = \frac{b_v \times N}{r} = f_v \times N$$

Where

$$f_v = \frac{b_v}{r}$$

With **f_v** known as the **rolling friction coefficient** which can be found with experimental tests.

4.3 Tractive force

Tractive force is the force needed to overcome the resistance caused by friction when two bodies slide or roll on each other. Compared to the resistance generated by friction, tractive force has the same intensity and the same sense, but the opposite direction. The lower the force needed to keep a equipment moving, the greater the smoothness of the wheel applied to the moving equipment.

In the specific case of a wheel rolling on a flat surface, the tractive force must overcome the resistance caused by rolling friction - that arises when the wheel comes in contact with the surface - and by sliding friction - generated by the mechanical bore and axle set coupling.

5. CHOOSING THE RIGHT WHEEL

Any product that isn't used under the conditions for which it was designed may not satisfy the user's needs. It may also damage materials and cause injuries.

Here are some examples in which wheels and castors are used incorrectly:

- using a wheel not suitable for the floor will deteriorate the wheel covering and damage the floor;
- choosing a fixed castor under operating conditions for which a equipment must be very manoeuvrable will make it extremely difficult to move that equipment;
- applying a load that exceeds the wheel's rated load capacity will lead to wheel malfunctions and premature deterioration.

Therefore, a technical analysis of the operating conditions must be performed. The most economical solution should be chosen only after the product has been technically evaluated.

The purpose of performing a technical analysis on a equipment moving solution is to define the operating conditions and any external factors that may affect equipment use.

The following factors must be analysed in order to choose the right wheel:

- **nature and condition of the ground (5.1)**
- **environment (5.2)**
- **magnitude and nature of the load (5.3)**
- **speed and means of traction (5.4)**
- **manoeuvrability (5.5)**
- **diagrams (5.6)**

The process of choosing the right wheel to match the operating conditions can be divided into three steps:

Step one: identifying the correct type of wheel based on the floor and the characteristics of the operating environment;

Step two: calculating the dynamic capacity, static load and rolling resistance required by the specific application and, therefore, determining the wheel diameter;

Step three: identifying the correct bracket and checking the dynamic capacity of the castor (wheel+bracket assembly).

If the evaluation of these various aspects generates different data with reference to the same wheel and/or castor characteristic, the final choice must be made based on the most conservative condition.

• **Static load [N]**

Static load is the maximum load that a motionless (stationary) wheel can support without generating any permanent deformations that may reduce its operating efficiency. A wheel mounted on a equipment that is seldom moved, and therefore almost always remains in the same position, is defined as being subjected to a static load.

• **Dynamic carrying capacity**

Dynamic carrying capacity of a wheel is defined as the value (expressed in N) of the maximum load that can be supported by that wheel in conformity with ISO 22883:2004 and UNI EN 12532:2001 that,

for industrial wheels, require dynamic testing under the following conditions:

- constant speed of 1.1 m/s (4 km/h)
- overcoming 500 obstacles and 15,000 revolutions of the diameter;
- obstacles with width 100 mm and height 5% of the wheel diameter with an elastic rolling strip (hardness up to 90 Shore A) and 2.5% of the diameter for wheels with a rigid rolling strip (hardness greater than 90 Shore A);
- temperature 20 °C (tolerance ± 10 °C);
- non-continuous operation (3 minutes of operation and 1 minute stopped);
- smooth, hard and horizontal floor.

• **Rolling resistance**

Rolling resistance is the value (expressed in N) of the maximum load that can be supported by each single wheel at a constant speed of 4 km/h with application of a tractive force or thrust equal to 50N (excluding the initial pickup). This value is obtained by applying a tractive force of 200N to a 4-wheeled equipment and measuring the magnitude of the maximum transportable load per wheel during normal moving conditions.

The applied tractive force of 200N complies with the international workplace standard for indoor moving and is universally recognised as the human fatigue limit that can be supported for extended periods of time.

5.1 Nature and condition of the ground

The nature and condition of the ground and the presence of any obstacles will have an influence on choosing the right wheel. They are also important factors affecting the performance of the moving equipment as well as the efficiency and the duration of the wheels and castors.

Special attention is required for cases involving uneven floors or where obstacles are present. In this case, the impact of the wheel against an obstacle generates advancement resistance whose magnitude depends on the elasticity of the rolling strip material. In fact, the energy absorbed during an impact is greater in a wheel with an elastic rolling strip than in a rigid wheel, thus partially cancelling the braking effects caused by the obstacle.

For floors that are uneven or on which obstacles are present, with load capacity being equal, a wheel with a greater diameter should be chosen in order to overcome the obstacle.

The wheel must be chosen very carefully in all cases in which there are obstacles, chemical and/or organic substances and machining residues. The main types of flooring are:

- tiles;
- asphalt;
- cement-resin;
- not paved floor;
- expanded metal floor;
- floor with chips, obstacles etc.

The main floor-wheel covering combinations are listed in the following table.

Floor type		Suitable covering
Tiles		Polyurethane or rubber
Asphalt		Rubber
Cement-resin		Polyurethane or rubber
Not paved		Rubber
Expanded metal		Rubber
With chips/obstacles		Rubber

5.2 Environment

To choose the right wheel, it's also important to determine if the wheel materials are compatible with the chemical-environmental conditions, the temperature, the humidity and the inductive electrostatic phenomena that may affect wheel operation.

The standard operating conditions are indicated in the manufacturer's catalogue for each type of wheel.

Chemical-environmental conditions

Because there are so many different types of aggressive chemical agents in work environments, it's difficult to provide a complete and exhaustive description.

The main chemical substances that a wheel may come in contact with include:

- weak acids (e.g. boric acid, sulphurous acid);
- strong acids (e.g. hydrochloric acid, nitric acid);
- weak bases (e.g. alkaline solutions);
- strong bases (soda, caustic soda);
- chlorinated and aromatic solvents (e.g. acetone, turpentine);

- hydrocarbons (e.g. petrol, oil, diesel oil, mineral oils);
- alcohol (e.g. ethyl alcohol);
- fresh water;
- salt water;
- saturated steam.

Therefore, when choosing a wheel, it's very important to check if the material forming the covering, the wheel centre body, the rolling actions and the bracket is compatible with the specific features of the operating environment. Caution is required in those sectors in which water, acids, bases, steam and other aggressive agents are often present. For example, a polyurethane wheel should be used instead of a tyred wheel in environments with a large quantity of oils, fats and hydrocarbons, while it is recommended to use stainless steel castors in humid environments and in the presence of high saline concentrations.

Temperature

If operating temperatures in an application differ from the standard range of values indicated by the manufacturer, check the resistance of the wheel materials. This not only applies to the rolling strip and the wheel centre body, but also to the type of lubricant used (it may be necessary to contact the manufacturer). The indicative percentages of carrying capacity variation as a function of temperature are shown in the following table.

Temperature range [°C]		Carrying capacity variation coefficient (1 = 100% of the carrying capacity)								
from	to	RE.FF	RE.F5	RE.F4	RE.F8	RE.G1	RE.E2	RE.E3	RE.G2	RE.G5
-40	-20	▲	▲	▲	0,50	▲	▲	0,40	0,40	▲
-20	0	1,00	1,00	1,00	1,00	0,80	1,00	1,00	1,00	1,00
0	+20	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
+20	+40	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
+40	+60	0,90	0,90	0,90	0,90	0,85	0,85	0,85	0,85	0,90
+60	+80	0,70	0,80	0,80	0,70	0,50	0,60	0,60	0,60	0,80
+80	+120	0,40	0,40	0,40	0,60	▲	▲	▲	0,40	0,40
> 120 °C		▲	▲	▲	▲	▲	▲	▲	▲	▲

▲ not recommended

The above-mentioned variation values refer to the prolonged and continued use (over 30 minutes) of the wheels at the specified ambient temperatures.

5.3 Magnitude and nature of the load

The magnitude of the load is the value [N] obtained by adding the weight to be transported to the equipment weight (tare). The nature of the load, either a liquid or a solid, has a significant effect on the wheel load capacity calculation. The formula to determine the load capacity for each wheel is:

$$Q = \frac{P_u + P_c}{n}$$

where: **Q** = load capacity for each wheel **P_u** = weight to transport **P_c** = equipment tare (equipment weight) **n** = number of wheels in contact with the ground

SOLID LOAD:

For a solid load, **n=3** for a four-wheeled equipment (where three out of four wheels are considered to be in contact with the ground at all times).

LIQUID LOAD:

For a liquid load **n=2** for a four-wheeled equipment (where two out of four wheels are considered to be alternatively in contact with the ground).

5.4 Speed and means of traction

A thorough analysis is indispensable when the equipment is part of an automated or continuous cycle production unit. In this case, all the forces that act on the wheel must be taken into consideration; therefore, it is recommended to include allowances and safety factors.

Equipment speed is an important factor when choosing a wheel. In fact, if the speed is 0, and thus the use is mainly static, it is enough to compare the load capacity for each wheel with the static load indicated in the manufacturers' catalogues.

If the speed is other than 0, then the means of traction must be taken into consideration.

The means of traction is the tool used to exert the force that moves the body. In industry, traction devices can be manual or mechanical. Manual moving refers to the situation in which the force is exerted by one or more persons, while mechanical refers to the situation in which such force is exerted by a mechanical device (on-board drives or by using towing devices).

- *Manual moving*

For manual moving, the speed is generally less than or equal to 4 km/h.

Choosing a wheel that allows only one operator to move a load should be based on a wheel rolling resistance value determined by the following formula:

$$S = \frac{P_u + P_c}{n}$$

where: **S** = rolling resistance **P_u** = weight to transport **P_c** = equipment tare (equipment weight)
n = number of equipment wheels (maximum 4) The value obtained should be compared to the wheel rolling resistance value indicated in the manufacturer's catalogue.

- *Mechanical moving with towing devices*

or towed mechanical moving, the wheel should be chosen based on the equipment's operating speed. The wheel rated dynamic load capacity normally refers to a speed of no more than 4 km/h (1.1 m/s).

If the speed is higher than 4 km/h, a correction factor must be applied to the load capacity value since the materials forming the wheel undergo chemical-physical changes during which their performances decrease with an increase in operating speed.

The indicative percentages of load capacity variation with an increase in speed for different types of wheels are shown in the following table.

Speed range [Km/h]		Carrying capacity variation coefficient (1,00 = 100% of the carrying capacity)								
min	MAX	RE.FF	RE.F5	RE.F4	RE.F8	RE.G1	RE.E2	RE.E3	RE.G2	RE.G5
0,00	4,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
4,00	6,00	▲	0,80	0,80	▲	▲	▲	▲	0,80	0,80
6,00	10,00	▲	0,60	0,60	▲	▲	▲	▲	0,60	0,65
10,00	16,00	▲	0,40	0,40	▲	▲	▲	▲	0,40	0,50
> 16 Km/h		▲	▲	▲	▲	▲	▲	▲	▲	▲

▲ not recommended

- *On-board mechanical movement*

For equipments with an on-board drive (equipments with drive wheels – self-propelled equipments), the wheels are subjected to particular stress and strain.

In fact, the drive wheels not only support the load, but also must transmit the tangent stress that allows the wheel and therefore the equipment to advance. In addition, the drive wheel covering is subjected to even greater stress.

In particular, when choosing wheels and castors for self-propelled equipments, the following factors must also be taken into consideration:

- type of plain or ball bearing applied in the bore;

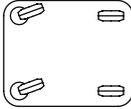
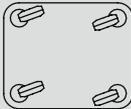
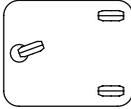
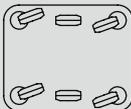
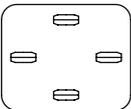
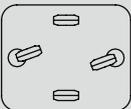
- shaft/bore coupling tolerances;
- bore material in relation to shaft material;
- start and stopping frequency of the motion transmission part;
- direction reversals;
- presence of even temporary overloads.

Since many factors have to be evaluated, it is recommended to contact us to choose the wheels and castors to apply to self-propelled equipments.

5.5 Manoeuvrability

Equipment manoeuvrability refers to the ability of a equipment to be moved more or less easily during use.

The limited space available inside some production departments or particularly winding routes that sometimes connect on work unit to another may require special equipment manoeuvrability characteristics to make operator tasks easier. Swivel castors allow the equipment to rotate and the greater the castor offset (i.e. the distance between the bracket rotation axis and the wheel rotation axis), the easier the rotation. However, though it does guarantee excellent manoeuvrability, excessive offset may cause the castor to oscillate along straight routes (Swimmy effect). Fixed castors do not allow the equipment to change direction but do guarantee directionality. In any case, the fixed castors must be mounted so that they are perfectly parallel to each other. The most common wheel layouts along with the relative castors are shown in the following table.

DIAGRAM	CASTOR LAYOUT	OPERATING CONDITIONS	APPLICATION EXAMPLES
	Stable equipment: two swivel castors and two fixed castors.	Long and straight routes. Few direction changes.	Mechanical workshops, semi-automated warehouses, metallurgical workshops.
	Stable equipment: four swivel castors.	Short routes. Frequent direction changes. Approach to machines or shelves.	Supermarkets, wood machining companies, small distribution centres.
	Stable equipment: one swivel castor and two fixed castors.	Long and straight routes. Few direction changes.	Small equipments Tool/object carriers Light loads.
	Tipping equipment two fixed castors and four swivel castors.	Long routes with mechanical towing. Few direction changes.	Moving in railway, postal, airport areas. Heavy loads.
	Tipping equipment four fixed castors.	Long and straight routes without direction changes.	Assembly or machining lines with round trip and head transfer device.
	Tipping equipment two fixed castors and two swivel castors.	Long routes with manual or mechanical towing. Few direction changes.	Mechanical and metallurgical workshops, semi-automated warehouses.

5.6 Choosing the wheel

Each of the parameters and operating characteristics outlined in the previous paragraphs is used in one of the three steps involved in choosing the wheel.

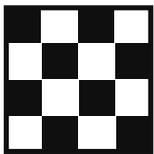
Step 1

The type of wheel suitable for the floor and operating environment is identified in step 1.

The following graph summarizes the factors that influence the choosing of the type of wheel; "type of wheel" means:

materials that form the covering and the wheel centre body; type of anchorage between covering and wheel centre body; rolling actions

FLOOR TYPE



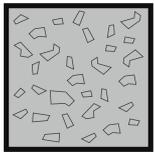
Tiles



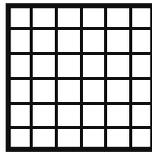
Asphalt



Cement Resin



Not paved

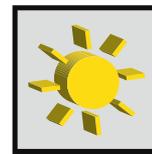


Expanded metal



With chips, obstacles, etc.

ENVIRONMENTAL CONDITIONS



Temperature



Humidity



Aggressive Chemicals



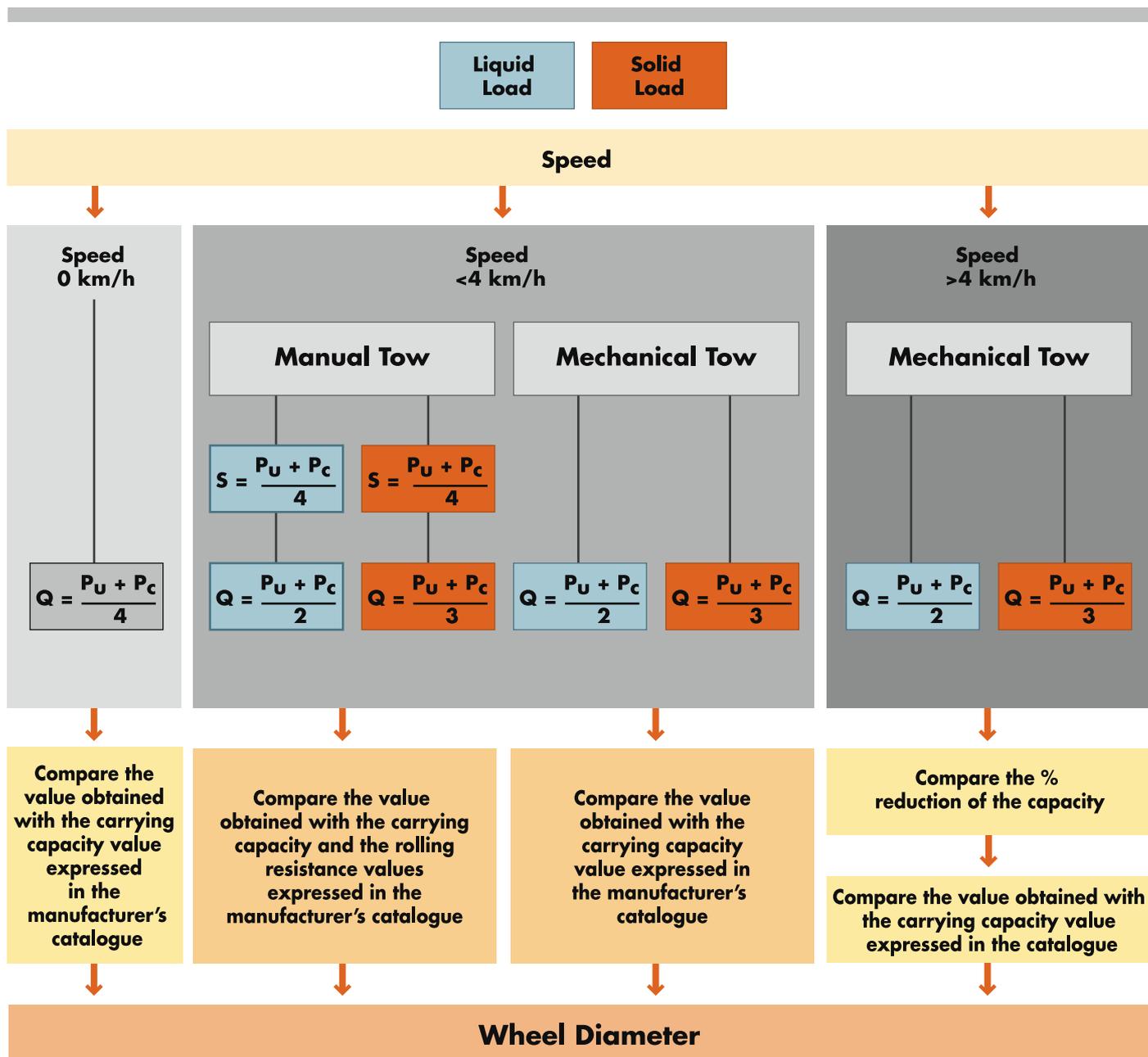
TYPE OF WHEEL

Step two

The load capacity, static load and smoothness values required by the specific application and needed to determine the wheel diameter are calculated in step two.

One of the most important parts of this step is an analysis of the load that the wheel must support. The following diagram indicates what calculations to perform and what values to consider depending on the various operating conditions. These aspects must always be indicated (magnitude and nature of the load and speed), while ensuring that all the values determined are not higher than the rated values indicated in the manufacturer's catalogue.

If the evaluation of various aspects generates different data with reference to the same wheel characteristic, the final choice must be made based on the most conservative condition.



S = rolling resistance **P_U** = weight to transport
Q = load capacity **P_C** = equipment weight

Step three

The correct castor is chosen in the third step. The step can be divided into two separate parts:

1. choosing fixed or swivel brackets, depending on manoeuvrability and directionality needs;
2. checking the compatibility between dynamic load capacity and rated dynamic load capacity of the wheel and bracket.

The following table summarizes some general indications for choosing the right wheels according to the application's features.

Selection parameters	Value range	RE.FF	RE.F5	RE.F4	RE.F8	RE.G1	RE.E2	RE.E3	RE.G2	RE.G5
Load capacity	 Light load, up to 250 kg	●	●	●	●	●	●	●	●	●
	 Medium load, up to 750 kg	●	●	●	●	▲	▲	▲	●	●
	 Heavy load, more than 750 kg	□	●	●	□	▲	▲	▲	▲	□
Rolling resistance	 < 125 kg	●	●	●	●	●	●	●	●	●
	 > 125 kg	□	●	●	●	▲	▲	▲	●	●
Flooring	 Tiles	●	●	●	●	●	●	●	●	●
	 Asphalt	●	●	□	□	●	●	●	●	□
	 Cement - resin	●	●	●	□	●	●	●	●	●
	 Not paved	▲	▲	□	▲	▲	●	●	●	□
	 Expanded metal	□	□	□	▲	●	●	●	●	□
	 With chips, obstacles, etc.	▲	□	□	▲	▲	▲	▲	●	□
Environmental chemical conditions	 No aggressive chemicals	●	●	●	●	●	●	●	●	●
	 With aggressive chemicals	□	□	□	●	●	▲	▲	□	□
Temperature	 -40° / -20°	▲	▲	▲	●	▲	▲	□	□	▲
	 -20° / +80°	●	●	●	●	●	●	●	●	●
	 +80° / +120°	□	□	□	□	▲	▲	▲	□	□
	 > 120°	▲	▲	▲	▲	▲	▲	▲	▲	▲
Means of traction	 Manual (speed ≤ 4 Km/h)	●	●	●	●	●	●	●	●	●
	 Mechanical (speed ≤ 16 Km/h)	▲	●	●	▲	▲	▲	▲	□	□

● recommended □ tolerated ▲ not recommended

6. GLOSSARY

Axle set

Connection through which the wheel is assembled to the castor. Normally, it consists of a threaded pin with nut, washers, tube and, where necessary, spacers.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Ball race ring

The part that encloses the castor rolling actions.

Bolt hole

Hole made in the top of the bracket and used to attach the castor to the equipment.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Bore

Central part of the wheel designed to house the axle set or the rolling actions that facilitate rotation (ball bearings, roller bearings, plain bearings...).

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Bracket

Connection part between wheel and equipment. Normally, all wheels must use a bracket to be applied to the equipment; an exception is made for wheels whose axle is built into the equipment.

Swivel bracket: rotates around its vertical axis as the operating direction changes; it can be a swivel plate bracket, swivel bracket with through hole or swivel bracket with stem. The swivel bracket can be equipped with a brake.

Fixed bracket: no rotation; it is designed to keep the wheel moving along a straight line.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Brake

A device that blocks the rotation of the bracket around its own axis, the wheel rotation or the rotation of the castor (wheel and bracket assembly). Front, rear brakes can be mounted on swivel castors.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Central pin

Swivel bracket part that joins the plate, fork and ball race ring; thanks to the central pin, the plate and fork form a single piece, while the ball race ring remains free to rotate around its own axis.

Wheel centre body

The wheel centre body is the wheel part that connects the covering to the bore. It comes in various shapes and is made of different materials; it can be a single piece or two or more parts joined together.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Covering

Outer ring of the wheel; it can be made of various materials and characterises the wheel. The covering is fixed when joined with the wheel centre body and is fitted when mechanically assembled on the wheel centre body.

Dynamic carrying capacity

Carrying capacity of a wheel is defined as the value (expressed in N) of the maximum load that can be supported by that wheel in conformity with European UNI EN 12532:2001 and International ISO 22883:2004 standards.

Dynamic testing under constant speed (4 km/h, 1.1 m/s) requires overcoming 500 100mm-wide obstacles, with height equal to 5% of diameter for wheels with an elastic rolling strip (hardness up to 90 Shore A) and to 2.5% of the diameter for wheels with a rigid rolling strip (hardness greater than 90 Shore A), without permanent deformation of the wheel affecting its operating efficiency.

Directionality

Possibility of an object to continue moving along a predetermined direction.

Dust seal

The part of the swivel bracket that protects the rolling actions.

Fork

Fixed or swivel bracket part that supports the wheel; normally, it has an upside-down "U" shape. The holes to house the wheel axle set are made at the bottom ends of the fork; the swivel actions are installed in the top.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Hardness

Propensity of a material to be penetrated by another material. It is measured with empirical tests that are used to evaluate the magnitude of the penetration of a specific force in the material under specific conditions. The penetration hardness is inversely proportional to the penetration.

Different tests can be performed to measure the hardness of a material. Shore A and Shore D durometers are used in some of the most widely used tests: durometer type A is used for the softer materials (elastomers), while type D is used for harder materials (thermoplastic material, polypropylene).

Reference standards: UNI EN ISO 868:1999 - ASTM D 2240-2004

Manoeuvrability

Possibility of an object to easily change its operating direction.

Plate

Top part of the bracket, with holes or slots used for the equipment connection. It can be made in different shapes: rectangular with four fitting holes, square with four fitting holes, triangular with three fitting holes, circular with a bolt hole, circular with a stem.

Reference standard: UNI EN 12526:2001 - ISO 22877:2004

Rolling resistance

Value (expressed in N) of maximum load, applicable for each single wheel that an operator can move, over level paths, even for long periods without fatigue.

Static load

Value (expressed in N) of the maximum load that a stationary wheel can withstand without generating any permanent changes to that wheel.

Reference standards: UNI EN 12527:2001 - ISO 22878:2004

Stem

Vertical end of the castor used to attach the castor into a hole in the equipment.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Tearing resistance

Capacity of a material to resist the propagation of a cut. It is measured through a test under the conditions defined in standards ASTM D 624b-2000 - UNI 4914:1987. During that test, a cut perpendicular to the tractive force is made on a test piece placed under traction.

Tread

Wheel external surface; the part of the wheel in contact with the ground. It can be smooth or sculpted with raised patterns to increase its grip on the ground.

Vulcanisation

Treatment with sulphur or sulphurous compounds applied to some substances, including rubber, to eliminate their plastic characteristics and to make them perfectly elastic.

Wheel

A circular mechanical assembly in which sliding motion is replaced by rolling motion through rotation around its own axis. The wheel consists of the following components: the tread, the covering, the wheel centre body, the bore and the rolling action. Depending on the different construction versions and materials used, wheels can be classified into four families: rubber, polyurethane, monolithic (hard tread) and pneumatic.

Reference standards: UNI EN 12526:2001 - ISO 22877:2004

Castors and wheels

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