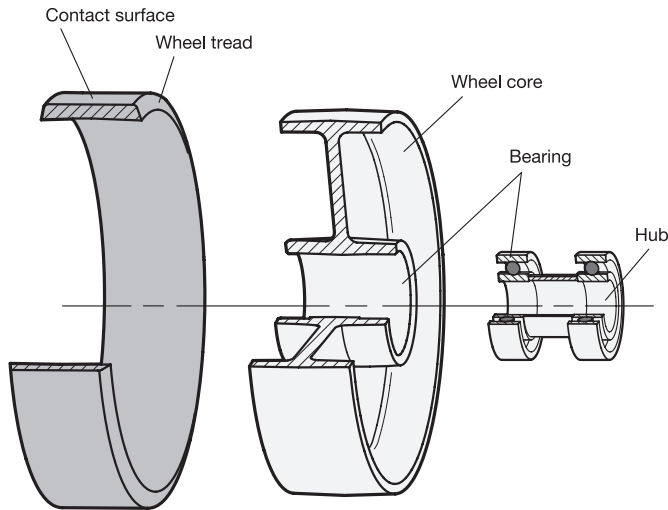


Wheel Structure

A wheel consists of the components **contact surface**, **wheel tread**, **wheel core**, **bearing** and **hub**. The properties and functions of these components are explained below.



The **contact surface** is the part of the wheel that touches the floor. It is also referred to as the profile. The contact surface may be smooth or textured to increase traction.

The **wheel tread** is the tire of the wheel. Its outer surface forms the contact surface. It can be made of various materials, and the associated material properties determine the potential areas of application for the wheel. It can be glued, vulcanized, cast or injection molded and is always firmly connected to the wheel body.

The **wheel core** is the main structural component of the wheel and serves as the rim, forming the connection between the tread and the bearing. Various designs are possible, such as versions with or without spokes, as well as a variety of materials. It can consist of a single part or multiple connected parts.

The **bearing** and the **hub** form the interface between the fixed axle and the wheel, which rotates around the axle. The selected bearing type has a direct influence on the running properties. A variety of wheel bearing types are used, such as ball bearings, roller bearings or friction bearings that run directly in the hub bore.



Wheel Tread, Materials

The following material options are available for the wheels: **Rubber**, **polyurethane**, **polyamide** and **phenolic resin**. These materials are explained below.

The **rubber** tread is made of natural rubber and/or synthetic rubber-based elastomer. It is applied to the wheel either via vulcanization or injection molding and has the following properties.

- + High elasticity and ease of movement
- + Gentle on floors
- + Low-noise
- + Vibration-damping
- High starting and rolling resistance
- Abrasion possible on rough floors

The **polyurethane** tread consists of an elastomer produced exclusively from synthetic materials. The polyurethane is applied to the wheel either by casting or injection molding and has the following properties.

- + Low starting and rolling resistance
- + High elasticity
- + Good resistance to wear and tear
- + Gentle on floors
- + Leaves no marks
- + Resistant to many aggressive media

On **single-part** wheels, the tread is determined by the base material of the wheel body; in other words, the tread and wheel core are produced from the same material in a single manufacturing process. The characteristic properties of the respective materials are explained below.

Polyamide:

- + Good resistance to wear and tear
- + Low starting and rolling resistance
- + Leaves no marks
- + Resistant to many aggressive media
- Can absorb and release moisture

Phenolic resin:

- + Heat resistant
- + Resistant to many aggressive media
- Lower wear and tearing resistance

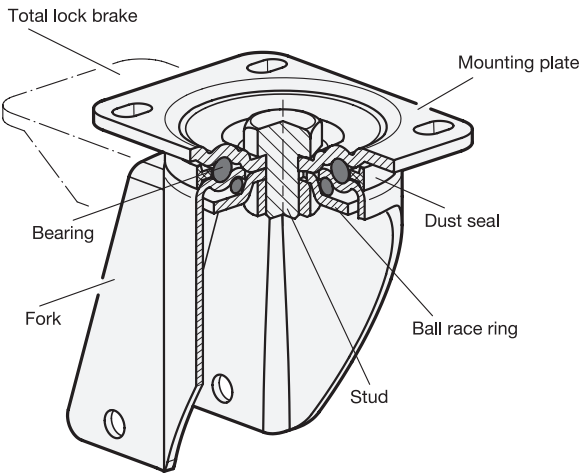
Bracket Structure

When a wheel is combined with a bracket, this is referred to as a swivel caster or rigid caster, depending on the bracket type. The bracket is the connecting element between the wheel and the cart. The various types are swivel brackets, swivel brackets with total lock brakes and rigid brackets.

Swivel Bracket

The swivel bracket rotates around its vertical axis when the pushing direction changes. The wheel axle is offset from the bracket axis to provide for good maneuverability of the cart. Maneuverability refers to both the ability to steer the cart and to move in a straight line.

Swivel brackets are made up of the individual components of **mounting plate, wheel support fork, bearing, ball race ring, stud** (or center hole) and, depending on the design, a **dust seal**.



The **wheel support fork** holds the wheel via the wheel hub and is connected to the fitting plate by the bearing.

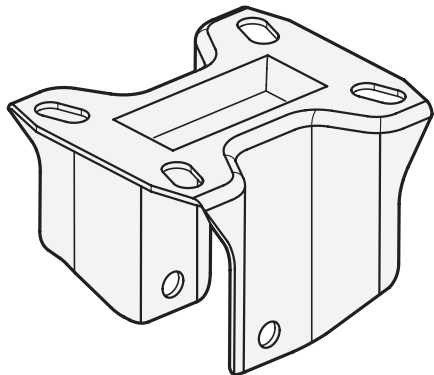
The **bearing** consists of a double axial ball bearing and allows the wheel support fork to rotate beneath the fitting plate. It is lubricated with grease and the **dust seal** protects it from dirt. The bearing is held together by the **stud** and the **ball race ring**, which forms the bottom surface.

The bracket is affixed to the cart via the **fitting plate**. The slotted holes make it easy to mount multiple casters in parallel.

A swivel bracket equipped with a **total lock brake** can be locked to prevent turning of both the wheel and the bracket.









Rigid Bracket

The rigid bracket consists of die-cut sheet steel and holds the wheel via the wheel hub. This combination is also called a rigid caster and helps keep the cart moving in a straight line.



Wheels

Overview of Types

Series		Bearing type	Wheel Ø (in mm)	Recommended maximum ergonomic load	Max. static load capacity	Max. dynamic load capacity
EN 22870 Page XYZ		Friction bearing	40 - 80	-	-	300 - 550 N 67 - 124 lbf
EN 22872 Page XYZ		Friction bearing	80 - 150	700 - 1800 N 157 - 405 lbf	1000 - 2700 N 224 - 607 lbf	700 - 1800 N 157 - 405 lbf
EN 22873 Page XYZ		Friction bearing	80 - 200	500 - 1400 N 112 - 315 lbf	1500 - 4000 N 337 - 900 lbf	650 - 2250 N 146 - 506 lbf
EN 22874 Page XYZ		Friction bearing	80 - 200	500 - 1400 N 112 - 315 lbf	2600 - 4100 N 585 - 922 lbf	650 - 2300 N 145 - 517 lbf
EN 22875 Page XYZ		Ball bearing	100 - 200	1800 - 3000 N 405 - 674 lbf	2500 - 10000 N 562 - 2248 lbf	1800 - 5000 N 405 - 1125 lbf
EN 22880 Page XYZ		Friction bearing	40 - 60	-	-	400 - 700 N 90 - 157 lbf
EN 22882 Page XYZ		Friction bearing	80 - 200	1200 - 3200 N 270 - 720 lbf	2200 - 7500 N 495 - 1686 lbf	1200 - 4500 N 270 - 1011 lbf
		Ball bearing	80 - 200	1300 - 3600 N 292 - 809 lbf	2200 - 7500 N 495 - 1686 lbf	1300 - 4500 N 292 - 1011 lbf
EN 22884 Page XYZ		Friction bearing	80 - 200	750 - 3000 N 169 - 674 lbf	1600 - 5000 N 360 - 1124 lbf	750 - 3000 N 169 - 674 lbf
EN 22885 Page XYZ		Ball bearing	80-200	1500 - 3600 N 337 - 809 lbf	2800 - 10000 N 629 - 2248 lbf	2200 - 8500 N 495 - 1911 lbf
EN 22886 Page XYZ		Ball bearing	100 - 200	3000 - 7000 N 674 - 1574 lbf	4000 - 10000 N 900 - 2248 lbf	3000 - 7000 N 675 - 1574 lbf
EN 22887 Page XYZ		Ball bearing	100 - 300	2200 - 6000 N 495 - 1349 lbf	5000 - 34000 N 1124 - 7644 lbf	3800 - 23000 N 854 - 5171 lbf
		No bearing	100 - 300	-	5000 - 42000 N 1124 - 9442 lbf	3000 - 25000 N 674 - 5620 lbf
EN 22892 Page XYZ		Friction bearing	65 - 200	900 - 3150 N 202 - 708 lbf	1250 - 8000 N 281 - 1799 lbf	1200 - 7300 N 270 - 1641 lbf
		Ball bearing	125 - 200	4000 - 6500 N 900 - 1461 lbf	7000 - 10000 N 1574 - 2248 lbf	6500 - 9000 N 1461 - 2023 lbf
EN 22868 Page XYZ		Ball bearing	80 - 85	2500 - 4000 N 562 - 900 lbf	7000 - 10000 N 1574 - 2248 lbf	5600 - 8000 N 1259 - 1799 lbf

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Series	Material			Suitable for floor type						
	Wheel tread	Wheel body	Tread hardness	Tiles	Asphalt	Cement-resin, concrete	Unpaved	Grate floor	Floor with chips	Floor with obstacles
EN 22870 Page XYZ	Rubber	Polypropylene	80 Shore A	+	-	+	-	-	-	+
EN 22872 Page XYZ			85 Shore A	+	-	+	-	-	-	-
EN 22873 Page XYZ			80 Shore A	+	+	+	+	+	+	+
EN 22874 Page XYZ		Sheet steel	80 Shore A	+	+	+	+	+	+	+
EN 22875 Page XYZ		Aluminum	70 Shore A	+	+	+	+	+	+	+
EN 22880 Page XYZ	Thermoplastic polyurethane	Polyamide	55 Shore D	+	-	+	-	-	-	+
EN 22882 Page XYZ			55 Shore D	+	-	+	-	-	-	-
EN 22884 Page XYZ			85 Shore A	+	-	+	-	-	-	+
EN 22885 Page XYZ	Polyurethane	Aluminum	92 Shore A	+	-	+	-	-	-	-
EN 22886 Page XYZ			75 Shore A	+	+	+	+	+	+	+
EN 22887 Page XYZ		Cast steel	92 Shore A	+	-	+	-	-	-	-
EN 22892 Page XYZ		Polyamide	70 Shore D	+	-	+	-	-	-	-
EN 22868 Page XYZ	Poly-urethane	Steel	92 Shore A	+	-	+	-	-	-	-

Casters

Overview of Types

Series	Co-ding	Wheel Ø in mm	Max. dynamic load capacity	Bracket type			Mounting methods		
				Rigid	Swivel	Swivel with total lock brake	Mounting plate	Center hole	Threaded stud
EN 22870 Page XYZ 	L	40 - 80	300 - 550 N 67 - 124 lbf	x	x	x	x	x	x
	D	50 - 75	600 - 800 N 135 - 180 lbf	-	x	-	x	x	x
EN 22872 Page XYZ 	L	80 - 150	700 - 1800 N 157 - 405 lbf	x	x	x	x	x	-
EN 22873 Page XYZ 	L	80 - 200	650 - 2250 N 146 - 506 lbf	x	x	x	x	x	-
EN 22874 Page XYZ 	L	80 - 200	650 - 2300 N 146 - 517 lbf	x	x	x	x	x	-
EN 22875 Page XYZ 	M	100 - 200	1800 - 5000 N 405 - 1124 lbf	x	x	x	x	-	-
EN 22880 Page XYZ 	L	40 - 60	400 - 700 N 90 - 157 lbf	x	x	x	x	x	x
	D	50	1400 N 315 lbf	-	x	-	x	x	x
EN 22882 Page XYZ 	L	80 - 200	1200 - 3000 N 270 - 674 lbf	x	x	x	x	x	-
EN 22884 Page XYZ 	L	80 - 200	750 - 3000 N 169 - 674 lbf	x	x	x	x	x	-
EN 22885 Page XYZ 	L	80 - 200	2000 - 3000 N 450 - 674 lbf	x	x	x	x	x	-
	M	125 - 200	3500 - 7500 N 787 - 1686 lbf	x	x	x	x	-	-

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Series		Co- ding	Wheel Ø in mm	Max. dynamic load capacity	Bracket type			Mounting methods		
					Rigid	Swivel	Swivel with total lock brake	Mounting plate	Center hole	Threaded stud
EN 22886 Page XYZ		L	100	2000 N 450 lbf	x	x	x	x	-	-
		M	100 - 200	3000 - 7000 N 674 - 1574 lbf	x	x	x	x	-	-
		H	160 - 200	5500 - 7000 N 1236 - 1574 lbf	x	x	x	x	-	-
EN 22887 Page XYZ		M	100 - 200	3500 - 7500 N 787 - 1686 lbf	x	x	x	x	-	-
		H	125 - 200	5500 - 10000 N 1236 - 2248 lbf	x	x	x	x	-	-
		E	150 - 300	10000 - 23000 N 2248 - 5171 lbf	x	x	x	x	-	-
EN 22892 Page XYZ		L	65 - 200	1200 - 3000 N 270 - 674 lbf	x	x	x	x	x	-
		M	100 - 200	3500 - 7500 N 787 - 1686 lbf	x	x	x	x	-	-
		H	125 - 200	6500 - 9000 N 1461 - 2023 lbf	x	x	x	x	-	-
EN 22894 Page XYZ		L	80 - 100	1500 - 2000 N 337 - 450 lbf	-	x	-	x	x	-

L = Light version
D = Double wheel version
M = Medium version
H = Heavy version
E = Extra-heavy version