

Load capacity / Wheel and castor types

Load capacity

In order to determine the required load capacity of a wheel or castor, the dead weight of the transport unit, the maximum additional load and the number of wheels and castors to be used must be known. By using four or more wheels or castors, the load bearing of the individual wheels or castors can vary. The required load capacity can be defined as follows:

$$T = \frac{E+Z}{n} \times S$$

T = Required load capacity of the wheel or castor

E = Dead weight of the transport unit

Z = Maximum additional load

n = Number of wheels or castors used

S = Safety factor

The safety factor S reflects the deviation from the standard application conditions (even floor, walking speed, load must act equally on all wheels or castors, straight travelling, ambient temperatures between +15° C and +28° C). The safety factor is influenced by the speed and the ratio between wheel Ø and height of the obstacles. A distinction is drawn between four categories:

- Indoor manual transport (height of the obstacles < 5 % of the wheel Ø):
Safety factor: 1.0 to 1.5
- Outdoor manual transport (height of the obstacles > 5 % of the wheel Ø):
Safety factor: 1.5 to 2.2
- Indoor power driven transport (height of the obstacles < 5 % of the wheel Ø):
Safety factor: 1.4 to 2.0
- Outdoor power driven transport:
Safety factor: 2.0 to 3.0

Safety factors do not consider abrasion of the tread.

Speeds higher than 4 km/h with a reduced load capacity are possible for wheels and castors with ball bearings fitted.

If a wheel or a fixed castor is mainly exposed to static loads, a load capacity increase up to 25 % can be assumed. With long endurance times under high loads, the danger of tread flattening must be considered.

The load capacity is stated in kg. To convert it into N, the common factors need to be implied. The following equation applies approximately: 1 kg \approx 1 daN.



Blickle light duty wheels and castors

Light duty wheels and castors and compact castors are mainly used with appliances and equipment for internal applications. They are designed for travelling speeds of up to 3 km/h. The maximum load capacity is 280 kg for light duty wheels and castors and 1750 kg for compact castors. They fulfil all requirements for high manoeuvrability of the respective appliances as well as for maximum smooth rolling performance at low rolling resistances. Typical application areas are medical equipment, display bases, equipment for large-scale catering establishments, etc.

Blickle light duty wheels and castors and compact castors are tested in regards of load capacity on a rotating bench in acc. to DIN EN 12530:

The most significant test characteristics are as follows:

- Speed: 3 km/h
- Temperature: +15° C to +28° C
- Hard, horizontal surface with obstacles of 3 % of the wheel diameter
- Test duration: Number of obstacles crossed corresponds ten times the wheel diameter (in mm)
- Break time: Max. 3 min after each 3 min running time



Blickle wheels and castors for transport equipment

Wheels and castors for transport equipment are used in the industrial sector, both indoor and outdoor. They are designed for travelling speeds of up to 4 km/h. The maximum load capacities amount to 900 kg. Transport equipment wheels and castors are insensitive to environmental influences, largely maintenance-free and run trouble-free over a long period of time. Typical application areas cover many types of equipment including pallets, working platforms, and waste containers.

Blickle wheels and castors for transport equipment are tested in regards of load capacity on a rotating bench in acc. to DIN EN 12532:

The most significant test characteristics are as follows:

- Speed: 4 km/h
- Temperature: +15° C to +28° C
- Hard, horizontal surface with obstacles of the following heights:
5 % of the wheel diameter for wheels with soft tread (hardness < 90° shore A)
2.5 % of the wheel diameter for wheels with hard tread (hardness \geq 90° shore A)
- Test duration: 15.000 x wheel circumference, at least 500 obstacles crossed
- Break time: Max. 1 min after each 3 min running time



Blickle heavy duty wheels and castors

Heavy duty wheels and castors are used in application areas with heavy loads and/or higher travelling speeds. They have a much sturdier design. To move extremely heavy loads, two-wheel castors are also used (twin wheel castors). For vibration free transport spring-loaded castors are particularly suitable. Typical application areas are storage and industrial trucks, assembly and transport systems, etc.

Blickle heavy duty wheels and castors are tested in regards of load capacity on a rotating bench at 4 km/h in acc. to DIN EN 12532 and at higher speeds to DIN EN 12533:

The most significant test characteristics in acc. to DIN EN 12532 are as follows:

- Speed: 4 km/h
- Temperature: +15° C to +28° C
- Hard, horizontal surface with obstacles of the following height:
5 % of the wheel diameter for wheels with soft tread (hardness < 90° shore A)
2.5 % of the wheel diameter for wheels with hard tread (hardness \geq 90° shore A)
- Test duration: 15.000 x wheel circumference, at least 500 obstacles crossed
- Break time: Max. 1 min after each 3 min running time

The most significant test characteristics to DIN EN 12533 are as follows:

- Speed: 6 km/h, 10 km/h, 16 km/h, 25 km/h (norm: max. 16 km/h)
- Temperature: +15° C to +28° C
- Hard, horizontal surface with obstacles of the following height:
5 % of the wheel diameter for wheels with soft tread (hardness < 90° shore A)
2.5 % of the wheel diameter for wheels with hard tread (hardness \geq 90° shore A)
- Test duration: Number of obstacles crossed corresponds five times the wheel diameter (in mm)
- Break time: Max. 1 min after each 3 min running time