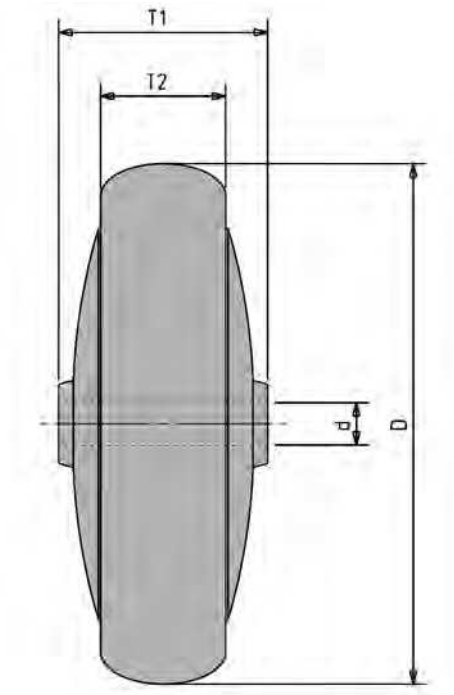
Wheels

Depending on their design, wheels can have very different rolling properties, resistances and load carrying capacities. They are made up of individual components: such as a press-on tire/tread or wheel, a rim or wheel body and a bearing.
The characteristics of the wheel depend on the various treads and rim components. The type of bearing also influences the load-carrying capacity, rolling characteristic, and rolling resistance of the wheel.

T1 = hub length
T2 = wheel width
D = wheel diameter
d = axle hole diameter



Bearing

Plain bearing: Simple, low-maintenance and impact-resistant bearing. No further bearing bushes are used in wheels made from polyamide or cast iron, since these materials have good gliding properties.

Roller bearing: Sturdy, resistant, low-maintenance bearing.
The most commonly used bearing for equipment that moves at low speeds. Featuring minimal rolling resistance.

Ball bearing: Smooth running for continuous use – even under heavier loads and at higher speeds.
Ball bearings are mainly used in technically demanding equipment rollers.

Determining factors when selecting wheels and rollers

1. Tires
The type of tire is very important when selecting the proper wheel or roller because the load-carrying capacity and rolling resistance depend on it. Thus the wheels and rollers listed in this catalog are categorized according to the main criterion of tire type.

2. Operating conditions
The condition of the traveling surface determines the tire quality and the wheel diameter. We recommend using large-diameter, elastic wheels for uneven surfaces.

The service life and the functionality of a wheel, roller or castor depends on, among other things, the extent to which the used materials or their surface finishes can withstand the effects of corrosion, temperature, and chemical substances.

Steel, which is normally used in the production of wheels and castors, has hardly any resistance to humidity when it does not have a protective coating. The steel is then slowly destroyed by corrosion. This is why the surfaces of the wheel and castor components feature a protective layer.
Apart from the degree of resistance offered by the different surface finishes, you must also consider that these protective layers can be damaged by mechanical influences.

Parts which are protected by special coatings will provide reduced corrosion protection when their protective coatings are damaged. Rust also starts to infiltrate the intact layer of coating located near the damaged area. When there is only minor damage, galvanized layers are advantageous because the zinc material provides corrosion protection.

This is because the zinc portion of the zinc/steel combination corrodes first as a result of the electrochemical processes, and the bare area is not affected.
The individual galvanized components are subjected to a supplementary chemical treatment referred to as chromating or passivation.

There is a difference between blue and yellow chromate finishes: the yellow chromate finish provides a greater degree of protection against moisture than the blue chromate finish.

Stainless steel provides good corrosion resistance. The predominant material (in 1.4301/AISI 304) is an 18-percent chromium-nickel steel alloy.

Chemical resistance
The chemical resistance of a castor or roller must be considered whenever aggressive media may come into direct contact with any components. The table on the following pages lists the different chemical resistances of materials used for tire treads and wheel bodies.

The data in our tables should only be used as guidelines. The chemical resistance properties are not only dependent on the type of reacting chemical, but also on the chemical concentration, duration of contact, and environmental conditions such as temperature and humidity.
Please contact us for advice if you are in any doubt about usage.

Caution: Mixtures of chemicals can have completely different influences than the data specified in the table. We accept no legal liability.

The required load capacity can be calculated using the following formula:

$$\frac{\text{Weight of the equipment} + \text{absolute maximum payload}}{3} = \text{required load per castor when using 4 castors}$$

Temperature resistance
The functionality of a wheel or castor also depends on the influence of temperature. The temperature specifications for the treads are derived from the interaction of the ambient temperature and the heat caused by flexing.

If plastic wheels, rims, or wheel bodies are being used, then temperature influences must be considered when selecting the proper material and bearing type. The load-carrying capacity and degree of stability are affected by cooling and heating.

The load-carrying capacity and the service life of treads decrease significantly at higher temperatures; this is why special treads and wheel materials have been developed for use at higher temperatures.

3. Load-carrying capacity
Use the following formula to calculate the load-carrying capacity for the product you have selected: Total weight of the equipment (= weight + payload) divided by 3 (often only three of four wheels have contact with the ground on uneven surfaces). Driving over obstacles can also cause temporary overloading.

The load-carrying capacities for wheels, castors and rollers that are specified in this catalog are valid for driving speeds up to 4 km/h when used on even, smooth surfaces at ambient temperatures between +10°C and +30°C. All dimensions, load-carrying capacities, tolerances, and true running accuracies correspond to the following standards: EN 12527 – 12533, DIN 7845.

Please also observe the prohibition symbols.

The load-carrying capacities are valid at driving speeds of 4 km/h on even surfaces. The load-carrying capacities that are specified for rollers, castors and wheels in this catalog are static-dynamic load values.

4. Type of usage and duration
Your application type and the length of time a wheel, roller or castor will be used are the criteria for selecting the proper bearing type.

Wheel bearings can be either:
plain bearings, roller bearings or ball bearings.

5. Starting and rolling resistances
The starting and rolling resistances are determined by the force required to move a vehicle. These resistances are dependent on the wheel material, the wheel diameter, the nature of the tread, the bearing element, and the load.

The larger the wheel diameter, the lower the rolling resistance. Wheels with polyamide and polyurethane tire treads attain the lowest starting and rolling resistances on even surfaces.

6. Technical note
We reserve the right to make technical changes.