

The safety and easy handling of a trolley depends on choosing the most suitable wheel, therefore, it is recommended to consider the following factors:

1. NATURE AND CONDITION OF THE FLOOR

The type of floor and the presence of any obstacles will have an influence on the thrust/traction force required to move the trolley, on the transmission of vibrations and wear of the wheel:

- Extremely thick wheels with soft tread and large diameter are normally chosen for uneven floors or with obstacles;
- Wheels with a more sturdy tread are normally chosen for smooth floors and heavy loads.

For each series, the catalogue shows the floor for which a wheel is suitable:



2. ENVIRONMENT OF USE

The wheel and bracket materials may or may not be suitable for use in aggressive environments: extreme temperatures, humidity, acids, solvents, bases and hydrocarbons.

The table on page 36 shows the compatibility with a detailed list of chemical substances. The table on page 38 shows the carrying capacity reduction upon temperature variation.

3. MAGNITUDE AND NATURE OF THE LOAD

The weight of the load, its nature (solid or liquid) and the tare of the trolley determine the minimum carrying capacity the wheel must have to guarantee safe handling.

With a 4-wheel trolley, calculate the minimum carrying capacity required using the following formula:

Solid load:

MINIMUM CARRYING CAPACITY REQUIRED = (SOLID LOAD WEIGHT + TROLLEY TARE): 3
(3 out of 4 wheels are always in contact with the ground)

Liquid load:

MINIMUM CARRYING CAPACITY REQUIRED = (LIQUID LOAD WEIGHT + TROLLEY TARE): 2
(2 out of 4 wheels are always in contact with the ground)

For each series, the catalogue shows the static, dynamic carrying capacity values and rolling resistance of each wheel.

4. MEANS OF TRACTION AND SPEED

For a static use (trolley handled only occasionally and stopped for most of the time), it is recommended to check:

STATIC CARRYING CAPACITY OF THE WHEEL > MINIMUM CARRYING CAPACITY REQUIRED

Whereas, if the trolley is intended for frequent use or for long distances, assess the type of handling: manual, with towed mechanical means or applied to a driving mechanism.

Manual handling

The trolley speed is generally less than 4 km/h; it is recommended to check:
DYNAMIC CARRYING CAPACITY OF THE WHEEL > MINIMUM CARRYING CAPACITY REQUIRED
ROLLING RESISTANCE > (SOLID/LIQUID LOAD WEIGHT + TROLLEY TARE):4

The smoother the wheel, the less effort is required.

For each wheel, Tellure Rôta catalogue shows the ROLLING RESISTANCE value: it is the maximum applicable load in correspondence of which the traction/thrust effort remains below 5 daN.

GLOSSARY

Static load



Maximum load (expressed in daN) that a motionless (stationary) wheel can support without generating any permanent deformation that may reduce operating efficiency.

Dynamic carrying capacity



Maximum load value (expressed in daN) that can be supported by a moving wheel. This value is determined in compliance with Standard ISO 22883-22884 for industrial use and ISO 22879-22880 for civil and domestic use. See page 42-43 for the test conditions.

Rolling resistance



The rolling resistance is the value (expressed in daN) 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 5 daN (excluding the initial pickup).

The 20 daN of traction/thrust force (corresponding to a 4-wheeled trolley) is the recommended limit for most of the adult working population. The tables in the introductory notes to each series highlight the traction force required for keeping a wheel, burdened by a certain weight, moving.

The values are detected on the TRLab laboratory test bench that detects the rolling resistance on a 1 metre long metal surface. They represent the average traction/thrust force value.

The force required for starting a wheel, defined starting point, significantly depends on the alignment position of the brackets and is always higher than indicated on the table.

The necessary force decreases if the wheel diameter increases: we recommend increasing the diameter down to traction/thrust values below 3 daN, for high movement frequency or movement along long sections.

For each series, the catalogue shows a table with the traction/thrust force at different load values, upon varying the diameter.

Towed mechanical movement

The dynamic carrying capacity of the wheels refers to a speed not higher than 4 km/h (1.1 m/s); the carrying capacity decreases if speed exceeds this value. Use the correction factor of the carrying capacity shown in the table on page 39 and we recommend to check:

$$\text{WHEEL DYNAMIC CARRYING CAPACITY} \times \text{CORRECTION FACTOR (\%)} > \text{MINIMUM CARRYING CAPACITY REQUIRED}$$

On-board mechanical movement

In this case the wheels are subjected to particular stress and strain, different case by case.

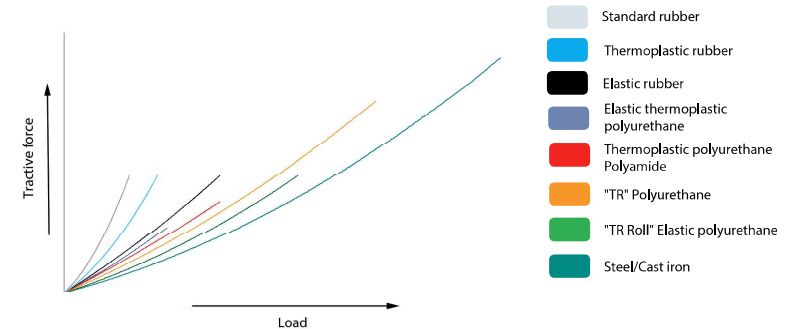
We recommend contacting Tellure Rôta Technical Service to choose the most suitable product for your application.

Based on the above information, the path provides:

- Choice of recommended wheels for the environmental conditions defined by the application (temperature, humidity, any aggressive chemicals and type of floor), based on the material compatibility tables and geometry of the product respect to its use.
- Choice of strap diameter and width to meet the carrying capacity, speed requirements and the product's easy movement.
- Choice of suitable bracket for the environment of use and for the requested speed and carrying capacity features.

Tellure Rôta provides its experience and know-how in the movement solutions sector so that choosing a wheel becomes the most satisfying process for the final user.

Comparison chart of the rolling resistance between the different materials



Comparison table of the hardness between the different materials

	Elastic rubber	"TR Roll" Elastic polyurethane	Standard rubber	Elastic thermoplastic polyurethane	Thermoplastic rubber	"TR" Polyurethane	Thermoplastic polyurethane	Polyamide		
Shore A	70	75	80	85	90	95				
Shore D						45	55	65	70	75

FURTHER DETAILS AND INFORMATION

AVAILABLE TABLES

- AGGRESSIVE CHEMICAL AGENTS COMPATIBILITY PAGE 36
- CARRYING CAPACITY ADJUSTMENTS BASED ON TEMPERATURE PAGE 38
- CARRYING CAPACITY ADJUSTMENTS BASED ON SPEED PAGE 39
- TABLE FOR CHOICE OF WHEEL PAGE 40

For further information on choosing the right wheel:

- see Internet site www.tellurerota.com
- contact Tellure Rôta Sales Department:
Tel. Export: 0039 059.410231-253 - Tel Italian Sales Dept.: 059.410300-306 -
E-mail: comm.estero@tellurerota.com - comm.italia@tellurerota.com

COMPATIBILITY WITH AGGRESSIVE CHEMICAL AGENTS

Materials		Steel	Stainless steel	Aluminium alloys	Cast iron	Standard rubber	Elastic rubber	Thermoplastic rubber	Polyamide	Polypropylene	TR Polyurethane	TR-Roll Polyurethane	Vulkollan® Bayer	Thermoplastic polyurethane	Resin
%															
ACIDS WEAK	Fatty acids	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Acetic acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Boric acid in solution 30	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Oleic acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Oxalic acid in solution 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sulphurous acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
STRONG ACIDS	Hydrochloric acid in sol. 30	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Chromic acid in solution 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Phosphoric acid in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Nitric acid in solution 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sulphuric acid in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
WEAK BASES	Aluminium acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Ammonium carbonate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Ammonium sulphate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium cyanide in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Alkaline solutions at 80°C	●	●	●	●	●	●	●	●	●	●	●	●	●	●
STRONG BASES	Ammonium hydrate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium carbonate in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium phosphate in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium hydroxide in sol.	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium silicate in sol. 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ALCOHOL	Alkybenzols	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Amyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Ethyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Methyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Propyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
SOLVENTS	Acetone	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Turpentine	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Amyl acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
HYDRO CARBONS	Petrol	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Diesel oil	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Mineral oils	●	●	●	●	●	●	●	●	●	●	●	●	●	●
OTHERS	Sea Water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Water at 80°C	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Cold water	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sodium Chloride in sol.	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Saturated steam 10	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● recommended ● partially resistant ● not suitable

CARRYING CAPACITY ADJUSTMENT CHART BASED ON TEMPERATURE FOR USE WITH MANUAL HANDLING

		Carrying capacity %							
		Temperature	-40/-20°C	-20/0°C	0/20°C	20/40°C	40/ 60°C	60/ 80°C	80/ 130°C
INDUSTRIAL - LIGHT DUTY LOADS	22	-	80	100	100	85	50	-	-
	23	40	100	100	100	85	60	-	-
	52	-	80	100	100	85	50	-	-
	53	40	100	100	100	85	60	-	-
	71	-	80	100	100	85	50	-	-
	82	-	100	100	100	100	-	-	-
	82AF	-	100	100	100	100	-	-	-
INDUSTRIAL - MEDIUM DUTY LOADS	60	-	100	100	100	90	70	40	-
	61	-	100	100	100	85	60	-	-
	68	50	100	100	100	90	70	60	-
	73	40	100	100	100	85	60	50	-
	73AE	-	100	100	100	85	60	-	-
INDUSTRIAL HEAVY DUTY LOADS AND MECHANICAL HANDLING	62AL	-	100	100	100	90	80	-	-
	62ER	-	100	100	100	90	80	-	-
	62GH	-	100	100	100	90	80	-	-
	62NY	-	100	100	100	90	80	-	-
	63AC	-	100	100	100	90	80	50	-
	63GH	-	100	100	100	90	80	50	-
	64	-	100	100	100	90	80	40	-
	65AL	-	100	100	100	90	80	40	-
	65GH	-	100	100	100	90	80	40	-
	65HT	-	100	100	100	90	80	40	-
	65ER	-	100	100	100	90	80	40	-
	66	-	100	100	100	90	80	40	-
	68P	50	100	100	100	90	70	60	-
	69	100	100	100	100	100	100	100*	100*
	72AL	40	100	100	100	85	60	40	-
72GH	40	100	100	100	85	60	40	-	
HIGH TEMPERATURE	67	50	100	100	100	100	100	100	
	68FV	70	100	100	100	100	100	100	
	72GS	50	50	100	100	100	100	100	
PALLET TRUCK ROLLERS	74	-	100	100	100	90	80	50	-
	75	-	100	100	100	90	80	40	-
	76	50	100	100	100	90	70	60	-
	77	-	100	100	100	90	80	40	-
	78	-	100	100	100	90	70	40	-
	79	-	100	100	100	90	80	-	-

- = not suitable

* = not suitable in ball bearing hub model

CARRYING CAPACITY ADJUSTMENT CHART BASED ON SPEED

		Carrying capacity %					
		Speed	< 4 km/h	6 km/h	10 km/h	12 km/h	16 km/h
INDUSTRIAL - MEDIUM DUTY LOADS	60	100	60	-	-	-	-
	61	100	60	-	-	-	-
INDUSTRIAL - HEAVY DUTY LOADS AND MECHANICAL HANDLING	62AL	100	100	80	70	60	-
	62ER	100	100	80	70	60	-
	62GH	100	100	80	70	60	-
	62NY	100	80	-	-	-	-
	63AC	100	80	65	60	50	Contact Tellure Rôta
	63GH	100	80	65	60	50	Contact Tellure Rôta
	64	100	80	60	50	40	-
	65AL	100	80	-	-	-	-
	65GH	100	80	60	50	40	-
	65HT	100	80	60	50	-	-
	65ER	100	80	60	50	-	-
PALLET TRUCK ROLLERS	72AL	100	80	-	-	-	-
	72GH	100	80	-	-	-	-
	74	100	80	65	60	50	Contact Tellure Rôta
	75	100	80	60	50	40	-
	77	100	80	-	-	-	-
	79	100	80	65	60	-	-

This table only shows references to the types of wheels that Tellure Rôta recommends for use at speeds above 4 km/h. For the products not found in this table, use with mechanical handling and at speeds above 4 km/h is not recommended.

For use at speeds above 4 km/h, we recommend using wheels with ball bearing hub, combined with Medium-heavy duty brackets P-PX, extra-heavy duty EP, electrowelded EE MHD, EE HD, EE EHD, twin electrowelded EEG MHD, EEG HD, EEG EHD. The light-duty SL, NL, NLX and medium-duty M brackets are not recommended for use at high speeds.

SUMMARY TABLE FOR CHOOSING THE RIGHT WHEEL

		Carrying capacity daN			Rolling resistance daN		Means of traction		Temperature °C	Chemical agents	Flooring															
		< 250	250 / 500	> 500	< 125	> 125	Manual	Mechanical			-40 / -20	-20 / +80	+80 / +130	> +130	Flooring											
															TE	ASPHALT	PAVE-CEMENT	PAVE-GRANITE	GRAVEL	WOODCHIP						
INDUSTRIAL - LIGHT DUTY LOADS	22	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	23	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	52	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	53	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	71	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	82	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	82AF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
INDUSTRIAL - MEDIUM DUTY LOADS	60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	61	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	68	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	73	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	73AE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	62AL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
INDUSTRIAL HEAVY DUTY LOADS AND MECHANICAL HANDLING	62ER	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	62GH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	62NY	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	63AC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	63GH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	64	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	65AL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	65GH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	65HT	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	65ER	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	66	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	68P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	69	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	72AL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	72GH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
HIGH TEMPERATURE	67	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	68FV	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	72GS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PALLET TRUCK ROLLERS	74	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	75	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	76	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	77	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	78	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	78	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	79	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● recommended ● partially resistant ● not suitable