

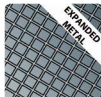
The safety and easy handling of a trolley depends on choosing the most suitable wheel, therefore, it is recommended to consider the following factors:

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:

					
TILES	ASPHALT	RESIN-CEMENT	NOT PAVED	EXPANDED METAL	WITH CHIPS
↓	↓	↓	↓	↓	↓
PLASTIC MATERIALS, POLYURETHANE, RUBBER	RUBBER OR ELASTIC POLYURETHANE	PLASTIC MATERIALS, POLYURETHANE, RUBBER	RUBBER OR ELASTIC POLYURETHANE	RUBBER OR ELASTIC POLYURETHANE	RUBBER OR ELASTIC POLYURETHANE

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 40 shows the compatibility with a detailed list of chemical substances. The table on page 42 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.

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 46-47 for the test conditions.

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.

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:

WHEEL DYNAMIC CARRYING CAPACITY x CORRECTION FACTOR (%) > 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.

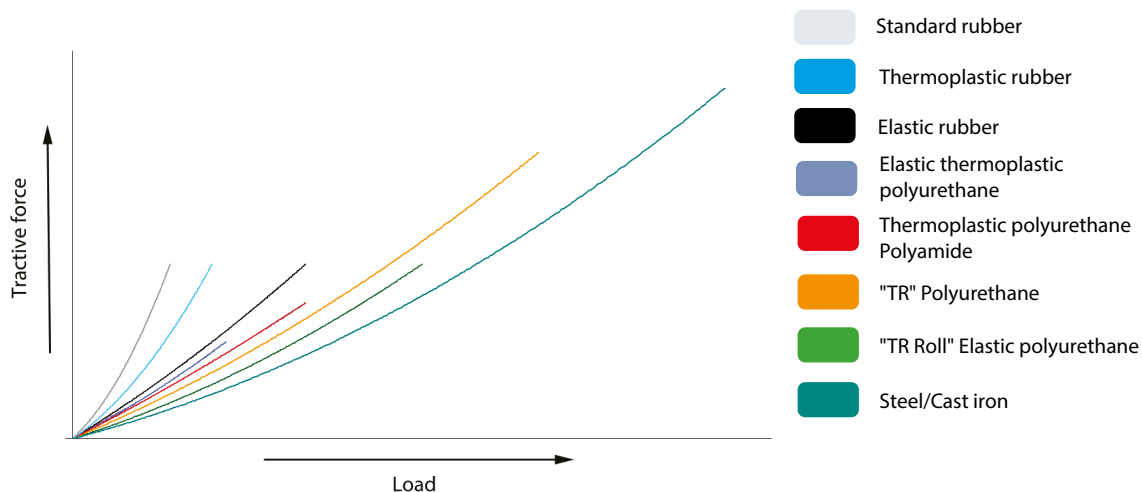
Tellure Rôta provides its experience and know-how in the movement solutions sector so that choosing a wheel becomes the most satisfying process for the final user.

FURTHER DETAILS AND INFORMATION

AVAILABLE TABLES

• AGGRESSIVE CHEMICAL AGENTS COMPATIBILITY	PAGE 40
• CARRYING CAPACITY ADJUSTMENTS BASED ON TEMPERATURE	PAGE 42
• CARRYING CAPACITY ADJUSTMENTS BASED ON SPEED	PAGE 43
• TABLE FOR CHOICE OF WHEEL	PAGE 44

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	Thermoplastic rubber Elastic thermoplastic polyurethane		"TR" Polyurethane	Thermoplastic polyurethane		Polyamide	
Shore A	70	75	80	85	90	92				
Shore D						45	55	65	70	75

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
%						
WEAK ACIDS	Fatty acids	●	●	●	●	●
	Acetic acid	●	●	●	●	●
	Boric acid in solution 30	●	●	●	●	●
	Oleic acid	●	●	●	●	●
	Oxalic acid in solution 10	●	●	●	●	●
STRONG ACIDS	Sulphuric acid	●	●	●	●	●
	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

ON-LOAD BEHAVIOUR VARIATION BASED ON TEMPERATURE FOR NON-INTENSIVE USE WITH MANUAL HANDLING

		Load resistance %							
Temperature		-40/-20°C	-20/0°C	0/20°C	20/40°C	40/ 60°C	60/ 80°C	80/ 130°C	>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	58AL	-	100	100	100	90	80	-	-
	58HT	-	100	100	100	90	80	-	-
	58GH	-	100	100	100	90	80	-	-
	62BS	-	100	100	100	90	80	-	-
	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	-	-
	63GH	-	100	100	100	90	80	-	-
	64	-	100	100	100	90	80	-	-
	65AL	-	100	100	100	90	80	-	-
	65GH	-	100	100	100	90	80	-	-
	65HT	-	100	100	100	90	80	-	-
	65ER	-	100	100	100	90	80	-	-
	66	-	100	100	100	90	80	-	-
	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	100
	68FV	70	100	100	100	100	100	100	-
	72GS	50	50	100	100	100	100	100	50
PALLET TRUCK ROLLERS	59HS	-	100	100	100	90	80	-	-
	74	-	100	100	100	90	80	-	-
	75	-	100	100	100	90	80	-	-
	75HS	-	100	100	100	90	80	-	-
	76	50	100	100	100	90	70	60	-
	77	-	100	100	100	90	80	-	-
	78	-	100	100	100	90	70	40	-
	79	-	100	100	100	90	80	-	-
ANTISTATIC AND STATICALLY CONDUCTIVE SOLUTIONS	53AS	40	100	100	100	85	60	-	-
	62ESD	-	contact with TR	100	100	contact with TR	contact with TR	-	-
	65ESD	-	contact with TR	100	100	contact with TR	contact with TR	-	-

- = not suitable

* = not suitable in ball bearing hub wheel

The % reduction of the load capacity are indicative and are shown in order not to compromise the product functionality. A dynamic use in environments constantly above 40° and below 0° must be carefully evaluated with Tellure Rôta, depending on the real conditions of use.

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	> 16 km/h
	INDUSTRIAL - MEDIUM DUTY LOADS	60	100	60	-	-	-
		61	100	60	-	-	-
	INDUSTRIAL HEAVY DUTY LOADS AND MECHANICAL HANDLING	58AL	100	80	-	-	-
		58HT	100	80	60	50	-
		58GH	100	80	65	60	contact with TR
		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 with TR
		63GH	100	80	65	60	50
							contact with TR
		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	-
		66	100	80	-	-	-
		72AL	100	80	-	-	-
		72GH	100	80	-	-	-
	PALLET TRUCK ROLLERS	59HS	100	80	65	60	50
							contact with TR
		74	100	80	65	60	50
							contact with TR
		75	100	70	50	40	30
		75HS	100	80	60	50	40
	ANTISTATIC AND STATICALLY CONDUCTIVE SOLUTIONS	77	100	80	-	-	-
		79	100	80	65	60	-
							-
		62ESD	100	100	80	70	60
		65ESD	100	80	-	-	-

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, heavy-duty brackets with hardened ball race PT, extra-heavy duty EP, electrowelded EE MHD, EE HD, EE EHD, twin electrowelded EEG MHD, EEG HD, EEG EHD, sprung loaded electrowelded EES MHD.

The light-duty SL, NL, NLX and medium-duty M brackets are not recommended for use at high speeds.