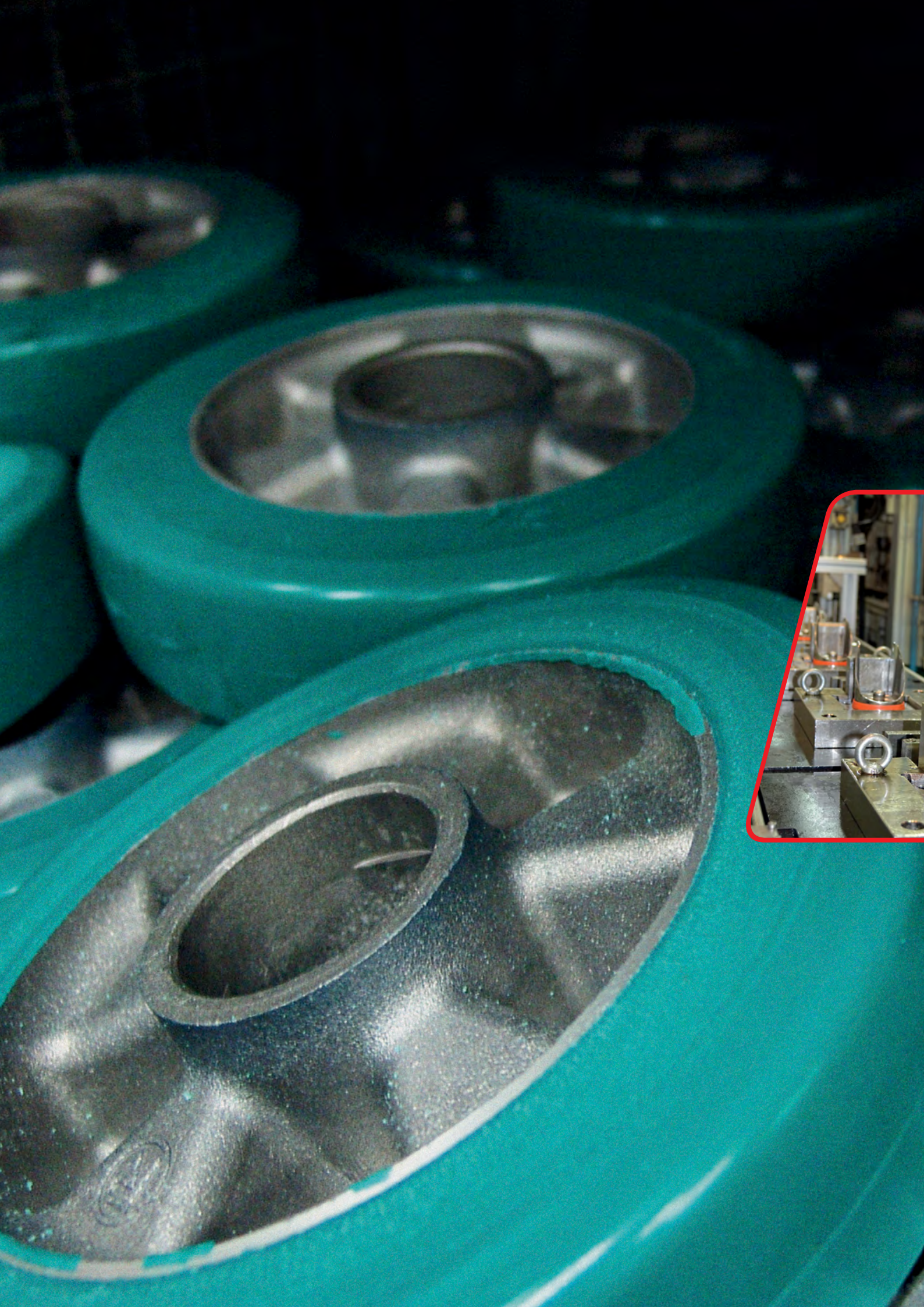
tellure Rôta
MOVING SOLUTION

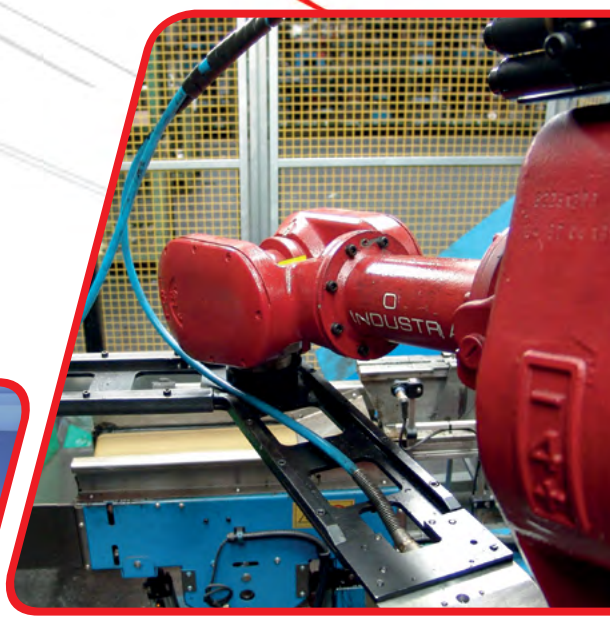
Polyurethane
Innovation and Quality



Moving Solution

To satisfy the handling requirements of our customers in the institutional and industrial sectors, through the design, production and sale of wheels and castors.

Tellure Rôta's mission



Tellure Rôta, a qualified partner for more than 2000 customers

60 years of experience in developing innovative products.

Know-how in **materials, technical solutions** and in the use of the most **modern design software**.

In-house **conception**, **design** and **production**, with accurate control of all production processes.

In-house laboratory "**TR Lab –Test & Research**" awarded with the High-Tech Network accreditation of the Emilia-Romagna Region.

More than **3500 items** available in our main catalogue and **customizations** according to customers' requests.

Quality (ISO 9001:2008), **Environment** (ISO 14001:2004), **Safety** (OHSAS 18001:2007) certifications.

Research and Innovation

Advantages

Polyurethanes are chemical blends obtained from a polymerisation reaction triggered by mixing two components, belonging to two different families of compounds (Di-Isocyanates and Polyalcohols), that have been previously heated to temperatures in order to keep them in liquid state with relatively low viscosity.

Polyurethane is much more **resistant** than rubber, **longer- lasting**, guarantees excellent **rolling resistance**. Moreover by changing types and formulation of polyurethane's chemical compounds, it is possible to obtain wheels with **specific features** for various types of applications.

On the whole, polyurethane has a much better price-performance ratio compared to rubber.

The use of polyurethane wheels guarantees to your handling equipment:

- **low maintenance costs**
- **ergonomics**
- **high carrying capacities**
- **high speeds**
- **resistance to wear and to tearing**
- **duration in time**

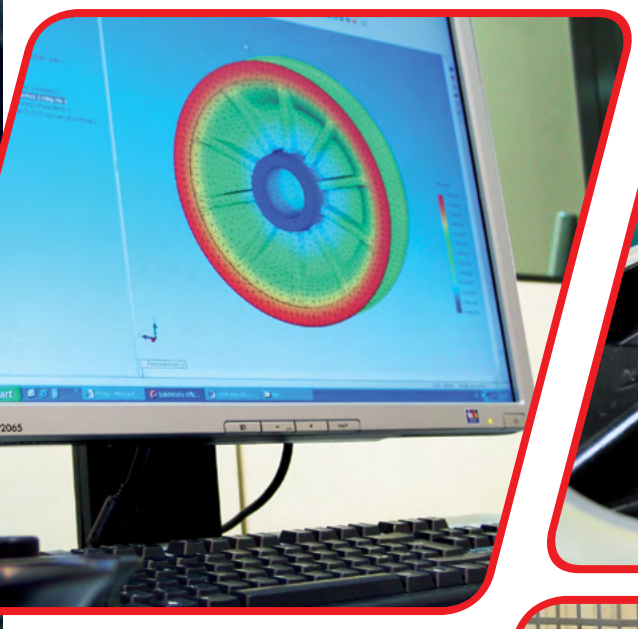
The origin of Tellure Rôta polyurethanes

Polyurethane wheels are developed and tested in our "**TR Lab – Test & Research**", a scientific in- house research facility which operates autonomously and which has been awarded with the High-Tech Network accreditation of the Emilia-Romagna region.

Our "Test & Research" Laboratory is based on a team of researchers whose activity is devoted to the development of innovative solutions to satisfy industrial handling needs, also in co-operation with important university research centres.

The steps of the development of Tellure Rôta polyurethane wheels are:

- **analysis** of the **ideal features** according to the conditions of the application
- definition of the most suitable **polyurethane blend**
- definition of the **dimensional specifications** of the product
- **simulation of the performance** of the new wheel through models which enable to predict the dynamic, thermal, fatigue, vibro-acustic properties of the wheel's tread
- **realization of prototypes** inside Tellure Rôta factory
- **test** in the laboratory and **on field-trials** thanks to customers' cooperation.



Range

Tile floor | Cement floor | Expanded metal floor | Asphalt floor | Not paved floor | Floor with chips

"TR" POLYURETHANE - *Resistance and reliability*

The excellent physical-mechanical features of the "TR polyurethane" guarantee a high resistance to wear, to tearing and to abrasion. It is particularly recommended for **heavy-duty applications** and it is suitable for a **speed up to 12 km/h**. The high-thickness variant enables the use on floors with obstacles too.

-20 +80 C°

"TR-ROLL" POLYURETHANE - *Comfort and Ergonomics*

It is an innovative product which combines the load capacity and the peculiar resistance to wear and tearing of the "TR Polyurethane" with the typical characteristics of the elastic rubber, such as an **easy overcoming of obstacles, vibration and shock absorption** and **noise reduction**. Its excellent performance on **rolling resistance** enables a smoother handling and a reduced effort made by the operators. It is also recommended for towing and high-speed applications.

-20 +70 C°

VULKOLLAN® - *Extreme conditions*

Produced under Bayer licence, it has excellent features of elasticity as well as of resistance to tearing, to wear and to abrasion; therefore it is the most suitable choice for **heavy loads associated with high-speed applications (up to 16 km/h).**

-20 +80 C°

"TR HIGH GRIP" POLYURETHANE - *Traction on wet surfaces*

Suitable for use with **electric-traction machines** requiring a higher grip at low speeds and low loads in **damp environments.**

-30 +70 C°

SPECIAL COMPOUNDS - *Polyurethane made to measure*

In co-operation with the customers, the " Test & Research" laboratory develops special blends to meet specific requirements**.**

Here are some examples of special polyurethanes made over the last years:

- Blends with specific electrical resistance values;
- Blends suitable for damp environments with harsh chemicals;
- Anti-bacterial blends;
- Blends with customised colours.

Features

A polyurethane for every application

Tellure Rôta offers four standard polyurethane blends:

- **"TR" polyurethane**
- **"TR-Roll" polyurethane**
- **Vulkollan®**
- **"TR High Grip" polyurethane**

Each type of polyurethane is characterised by a series of mechanical parameters (as shown in the table on the right); by changing these specifications, the researchers of the "Test & Research" laboratory are able to adapt a wheel to a specific application.

MECHANICAL FEATURES OF BLENDS

Hardness: it influences the comfort and the noisiness of the trolley. A soft and thick polyurethane tread allows a noiseless and vibtarionless handling.
Norms of reference: UNI EN ISO 868:2009 - ASTM D 2240:2010.
Impact Strength/Resilience: it determines how much energy is lost during a quick deformation (compression/release). The more the elasticity, the less the energy lost and the better the rolling resistance.
Norms of reference: UNI ISO 4662:2011.
Abrasion loss: it is a value measured on the bench that determines the resistance to wear for abrasion. The actual wear of a wheel may then be influenced by many conditions such as the conditions of use and the type of floor .
Norms of reference: UNI ISO 4649:2011.
Ultimate tensile strenght: maximum traction load that a sample of material withstands before breaking.
Norms of reference: UNI 6065:2001 - ISO 37:2011 - ASTM D 412a-2006.
Ultimate elongation: maximum extension that a sample of material subjected to traction reaches when breaking. It is normally expressed as a percentage elongation with respect to the original length of the sample.
Norms of reference: UNI 6065:2001 - ISO 37:2011 - ASTM D 412a-2006
Tearing resistance: capacity of a material to resist to the propagation of a cut when a sample of material is subject to traction.
Norms of reference: UNI ISO 34-1:2011 - ASTM D 624-2007.

	"TR" POLYURETHANE	"TR ROLL" POLYURETHANE	VULKOLLAN®	"TR HIGH GRIP" POLYURETHANE	ELASTIC RUBBER
					
Hardness	95 +/- 3 Shore A	75-80 Shore A	92 +/- 3 Shore A	80 +/- 3 Shore A	70 +/- 3 Shore A
Resilience	44 +/- 6%	72 +/- 4%	60 +/- 5%	40 +/- 3%	65 +/- 5%
Abrasion loss	40 +/- 5 mm^3	45 +/- 7 mm^3	40 +/- 5 mm^3	115 +/- 30 mm^3	250 +/- 50 mm^3
Ultimate tensile strength	35 +/- 7 MPa	30 +/- 5 MPa	45 +/- 7 MPa	8 +/- 2 MPa	7 +/- 3 MPa
Ultimate elongation	300 +/- 50%	440 +/- 40%	550 +/- 50%	190 +/- 30%	300 +/- 50%
Tearing resistance	120 +/-30 kN/m	90 +/-10 kN/m	160 +/-20 kN/m	50 +/-10 kN/m	45 +/-5 kN/m
Dynamic carrying capacity	EXCELLENT	EXCELLENT	EXCELLENT	GOOD	MEDIIUM
Rolling resistance	GOOD	EXCELLENT	GOOD	MEDIIUM	MEDIIUM
Resistance at higher speed	GOOD	EXCELLENT	EXCELLENT	GOOD	NOT SUITABLE
Resistance to wear and to tearing	EXCELLENT	EXCELLENT	EXCELLENT	GOOD	NOT SUITABLE
Handling comfort	GOOD	EXCELLENT	GOOD	EXCELLENT	EXCELLENT
Capacity to overcome obstacles	MEDIIUM	EXCELLENT	GOOD	GOOD	EXCELLENT
Resistance to oils	GOOD	GOOD	EXCELLENT	MEDIIUM	NOT SUITABLE
Resistance to alcohol	GOOD	GOOD	BUONO	MEDIIUM	MEDIIUM
Resistance to hydrolisis	MEDIIUM	MEDIIUM	MEDIIUM	GOOD	GOOD
Resistance at higher temperatures	up to 80C°	up to 70C°	up to 80C°	up to 70C°	up to 70C°
Resistance at lower temperatures	up to -20C°	up to -20C°	up to -20C°	up to -30C°	up to-20C°

Controlled Production

Production process

The production of Tellure Rôta polyurethane wheels comprises 4 phases:

1. Preparation of the centres

The perfect bonding of the tread to the centre of the wheel depends on the accurate treatment of the centres before casting. Centres can be made of aluminium, polyamide, steel and cast iron.
Depending on the type of centre, the following operations may be carried out:

- washing and degreasing of the centres to remove all impurities;
- sand-blasting of the centre surface to enhance its bonding properties;
- spraying of the adhesive onto the centre;
- drying in a controlled temperature oven.

The last two operations are made twice to guarantee a greater precision of the adhesive thickness.

2. Casting

The casting process is carried out with three separate equipment, each one to prepare a specific blend, and their corresponding automatic or manual casting benches.

An accurate control of raw materials and of all production parameters is required to accomplish the right execution of all chemical reactions involved and in respect of each polyurethane blend.

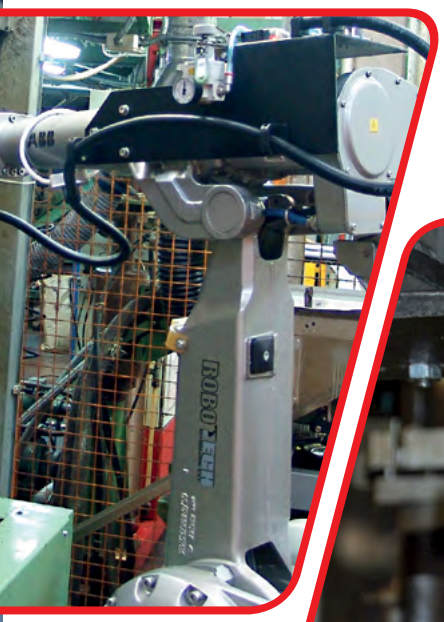
3. Seasoning

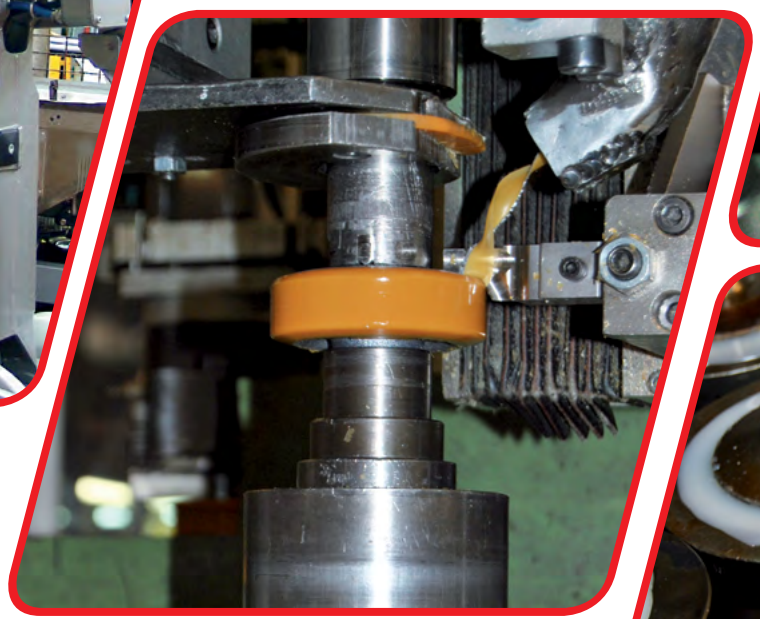
After the casting, wheels need a seasoning process which is necessary to complete all chemical reactions in order for the tyre to achieve its optimal performance abilities. Seasoning is made in controlled-temperature ovens since temperatures vary according to each polyurethane blend.

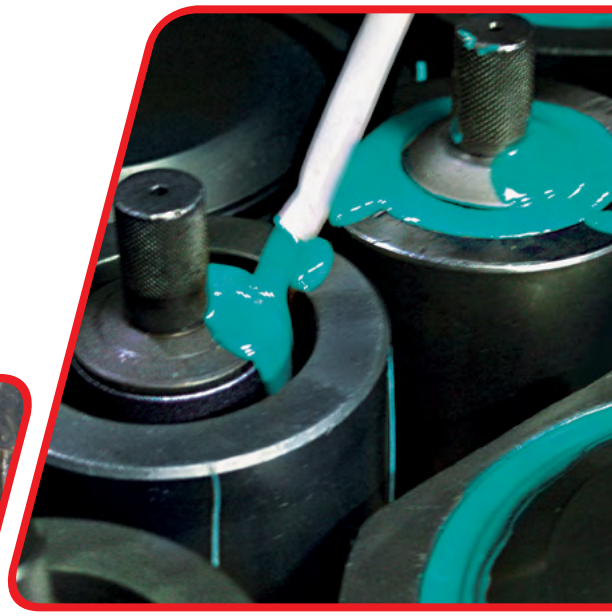
4. Finishing

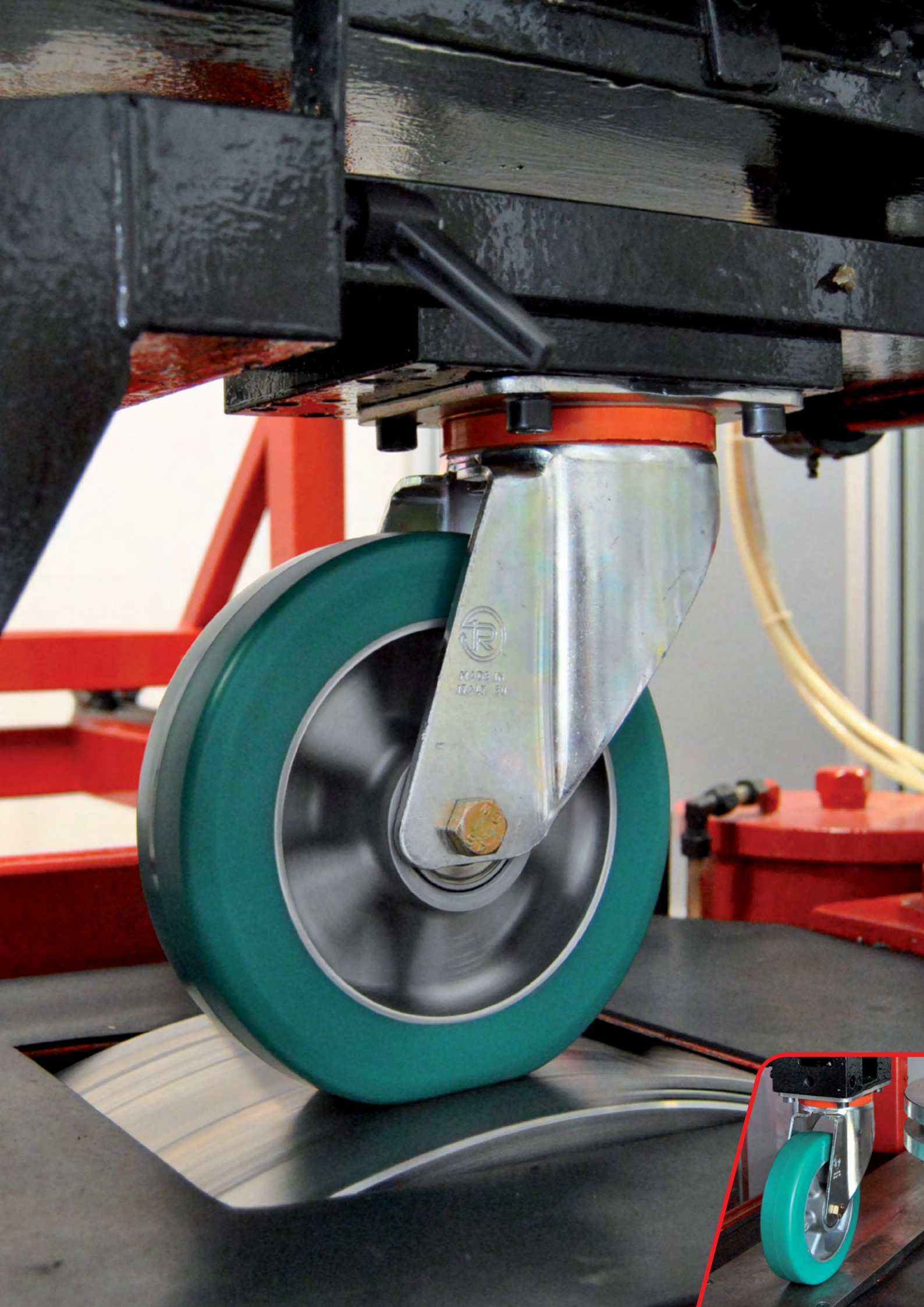
The polyurethane tyre is machined to remove the material in excess left from casting. The finishing is carried out on automated CNC lathes.
At the end of this process, cast iron centres are painted with ecologic paint.

At the end of the above process, polyurethane wheels are subject to strict quality tests carried out both in production and in the " Test & Research Lab".








MADE IN
ITALY

Certified Quality

Quality tests

Production tests

Peel tests are carried out daily on samples taken from production. The Polyurethane tyre is pulled off the centre in order to measure the required force to do so and to make sure that this effort is conform to our standards.
Moreover, a control of the bonding to the centre is made on every polyurethane wheel.

Laboratory tests

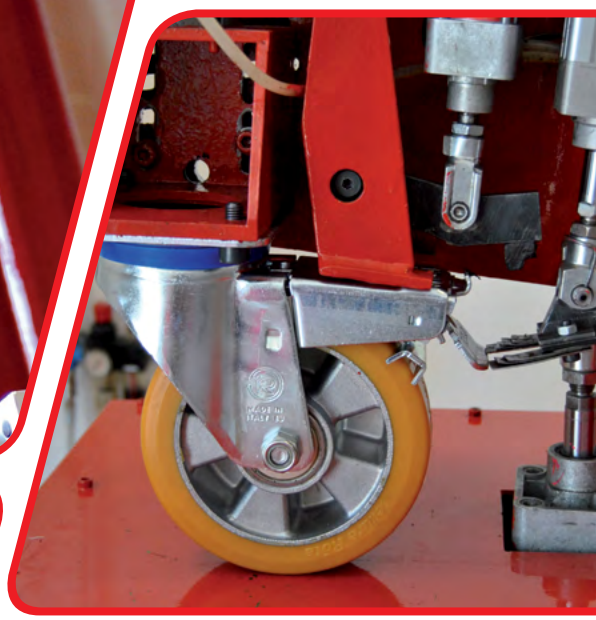
The "Test and Research Laboratory" daily controls the main physical and mechanical features of all polyurethanes being produced (hardness, resilience,density, wear and tearing resistance).Samples picked from the daily production are tested with specific equipment.

The "Test & Research Laboratory" is equipped with machineries and instruments to carry out specific tests on polyurethane wheels in order to verify:

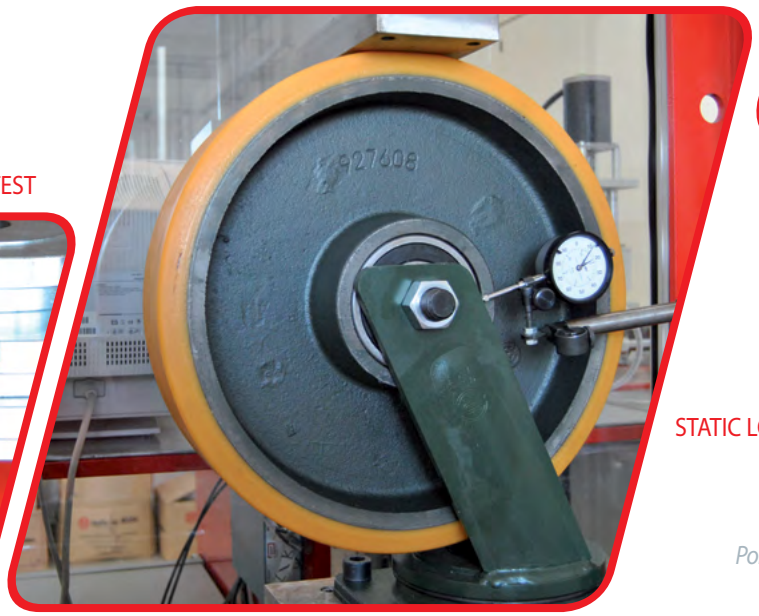
- the dynamic load, according to ISO 22883:2004 and ISO 22884:2004 international standards;
- the static load of wheels having a diameter up to 600 mm and a load capacity in between 1.000 and 20.000 DaN;
- the rolling resistance, according to UNI 11330 international standard;
- the grip properties of drive wheels;
- the electrical resistance;
- the conformity to norms of a specific application.

It is possible to take a look of the laboratory's equipment and services by visiting the Internet site **www.trlab.it**.

ULTIMATE ELONGATION TEST



BRAKING EFFICIENCY TEST



ROLLING RESISTANCE TEST

STATIC LOAD TEST


Alfa Romeo
Alfa Romeo
BOSCH

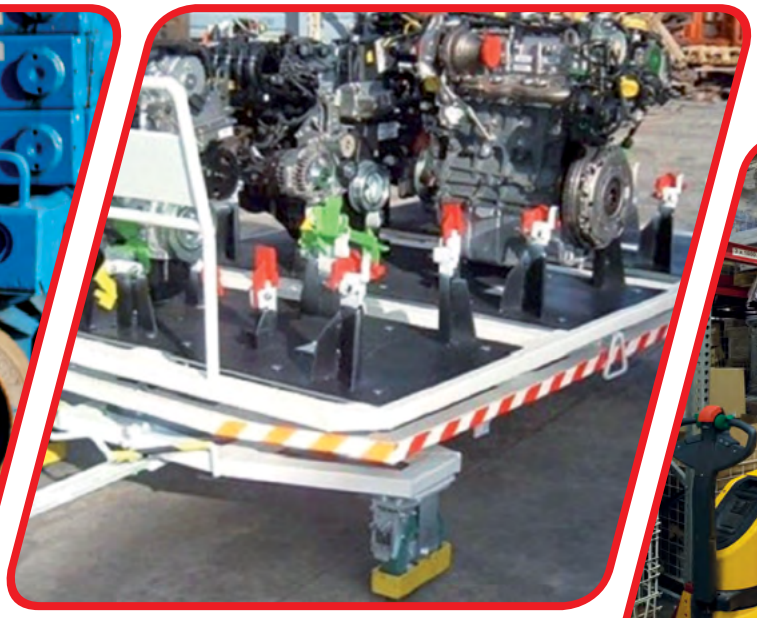
Usage

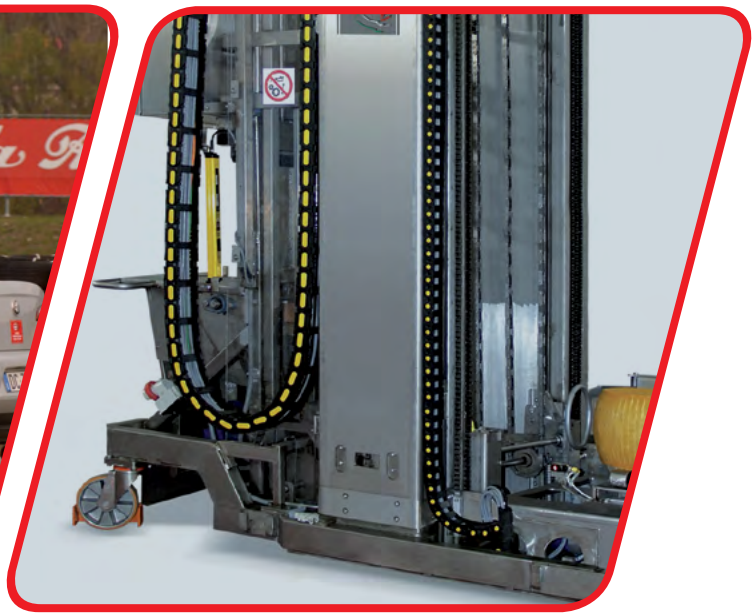
Applications

The standard Tellure Rôta polyurethanes, along with possible customisations, is capable of covering a wide range of applications.

They are recommended for several **equipment and trolleys used in different sectors** : food, automotive, textile, logistics, nautical, wood and glass industries as well as fun-fairs, lifts and scaffolds.

Wherever **excellent performances, duration in time, resistance to heavy conditions** are required, **the best solution is a Tellure Rôta polyurethane wheel**.





SEE WEBSITE

tellure Rôta
MOVING SOLUTION

UNI EN ISO 9001:2008
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OHSAS 18001:2007

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