



Best of Vulkoprin



60 years wheel team



Passion for polyurethanes

For 60 years now, Vulkoprin has been designing and producing a full range of polyurethanes that meet the requirements of the most demanding technical applications. For the production of high-quality wheels, guiding rollers, tyres and technical moulded parts, Vulkoprin uses only the finest raw materials and can rely on a passionate team of experienced people. Read the story of our Wheel Team.

'90s

- 1990 Start of Bert Maes
- 1990 Introduction of CAD
- 1994 Acquisition of Romeca
- 1994 2nd production line
- 1995 First welding robot
- 1995 First ISO 9001 certificate
- 1996 Move to 3D CAD

'70s

- 1972 Move to Herderstraat in Tielt
- 1973 Start up Vulkoprin Deutschland in Minden

'00s

- 2000 New building and move from Romeca to Tielt
- 2000 Acquisition of Vorwerk
- 2002 Development of Vulkollan C
- 2004 Acquisition of Huber + Suhner/Hannecard GmbH Switzerland
- 2004 Development of PX
- 2007 Running first AGV
- 2010 Automated paint line
- 2010 Start of 3rd generation Wim Maes
- 2011 Introduction Vulkoprin Production System (VPS)
- 2011 ISO 14001 certification
- 2013 Start of 3rd generation Leen Maes
- 2017 More than 100 Wheel Team members
- 2018 Further robotisation
- 2018 Renovation offices
- 2019 Extension of polymerisation room
- 2019 Digitalisation of processes
- 2019 Start of 3rd generation Simon Maes
- 2020 Additional casting line
- 2020 Acquisition of Vulkoprin Deutschland GmbH
- 2021 Supplier of the year Toyota Material Handling
- 2022 Retirement of Jan Maes - boarding of next leading generation with Leen Maes (CEO) and Bert Maes (CTO)
- 2022 ISO 45001 certification
- 2022 Refresh website and further digitalisation
- 2023 New welding robot/extension of CNC
- 2024 60 years of experience and preparing a sustainable future
- 2024 Ecovadis committed

'60s

- 1964 Start up Vulkoprin
- 1964 Vulkollan® licence

'80s

- 1980 First casting machine
- 1985 First CNC
- 1985 PV96 developed for rollercoaster market
- 1986 Start of Jan Maes



The Vulkoprin Wheel Team

Mission & Competence

Vulkoprin pursues a business model that creates an economic contribution for all stakeholders. We want to achieve this as a “preferred supplier” for the development, production and supply of wheels and technical mouldings in polyurethane for companies worldwide in the Material Handling industry, Amusement park sector, Machine industry and MRO.

Unique selling proposition & Security

Vulkoprin produces wheels and technical mouldings in polyurethane that are guaranteed to handle extreme load, high speeds, extreme temperatures and high deformations.

Vulkoprin is in its sector:

1. Best in quality: quality developed in accordance with demand and application, manufactured in a “state-of-the-art” production environment
2. Best in efficiency: maximum “value for money”
3. Best in reliability: we strive to keep our promises

Vision & Comfort

Vulkoprin strives to be an environmentally conscious, operational excellent and lean company.

Vulkoprin links this objective to values around the well-being of its employees, corporate social responsibility, the environment and sustainability.

Competence, Comfort & Security

ISO 9001, ISO14001 and ISO 45001 and feedback of our customers confirm that we also achieve our mission.

We received the award from Toyota Material Handling Europe, which chose Vulkoprin as “Supplier of the year” in 2021. “Vulkoprin’s clear customer focus, strong leadership, modern and highly automated production unit, stable cost-efficient output, low quality issues and total transparency are the reasons why we have decided to reward Vulkoprin as supplier of the year”, says Giorgio Polonio, Vice President Purchasing Toyota Material Handling Europe.

State-of-the-art production facility

Customers from various industries are sure that the entire wheel or wheel assembly is designed and manufactured by Vulkoprin.

Quality for extreme applications

The wheel solutions we manufacture must be able to withstand extreme loads and temperatures, high speeds, wear and deformation.

Innovate together with our customers

The fully integrated, state-of-the-art production facility allows both individual items and large volumes to be produced. Developing specific tailor-made solutions together with our customers. This is the Vulkoprin definition of innovation.

Operational excellence

ISO 9001, ISO 14001, ISO 45001 and ecovadis confirm the ambitions as an environmentally conscious, operational excellent and lean company. Vulkoprin connects this certification to values around the well-being of its employees, corporate social responsibility, the environment and sustainability.



Industries



Material handling industry

Vulkoprin designs and manufactures a full range of drive and load wheels for forklifts, AGVs (Automated Guide Vehicles), stacker crane, shuttles and heavy loaders.

Vulkollan® and Printhane-X™, with high load capacity and tear strength, minimal rolling resistance and deformation over a wide temperature range, guarantees wheels of the highest quality in demanding applications.

The design, the selection of materials up to the final assembly and testing is done in-house.

Vulkoprin is manufacturer of all OEM brands and “Supplier of the year 2021” of Toyota Material Handling.



Machinery industry

Reliable performance and maximum service life are the main distinguishing factors of Vulkoprin wheels for the machine industry.

Optimal mechanical properties, vibration reduction, wear resistance and chemical protection are just some of the properties of wheel designs made of Vulkollan® and Printhane-X™, tailored to the individual customer.

In-house engineering & testing makes Vulkoprin the ideal partner for every OEM.



Theme park industry

Reliable partner for amusement parks and ride manufacturers.

The use of top-quality materials such as Vulkollan® and Printhane-X™ withstanding high loads, high speeds, abrasion and deformation guarantees high safety, less standstill and less maintenance.

Maximal fun for visitors thanks to a perfect combination of low rolling resistance, high load bearing capacity and minimal heat build-up. Quality assurance is our top priority.



Maintenance, Repair and Operations

One-stop-shopping for various standard and tailor-made wheel solutions and technical mouldings.

Extensive range of wheels in different materials in stock.

Products

Discover a wide range of wheel- and technical parts solutions. Vulkoprin can deliver worldwide standard and customised wheels. Select your product category on our website (www.vulkoprin.be/products) and download the online catalogue to view a table of products. An interactive website with multiple search attributes is also available. The Vulkoprin CAD Service allows you to integrate our standard products into your design and construction process.



Drive wheel



Guide wheels



Light duty castor



Glass transport roller



Load wheel single or in castor



Rollers



Customised solutions



Technical moulded parts



Press-on-tyre



Refurbishment



Applications

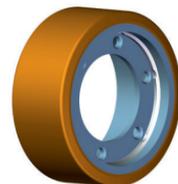
Reliable performance, maximum service life and preventing unplanned downtime are the main distinguishing factors of Vulkoprin wheels.

- Shock-absorbing wheels reduce drum vibrations to a minimum and provide many years of proven performance in the food and waste industry.
- Water- and oil-resistant wheels with anti-corrosion protection are resistant to all types of weather and guarantee continuous use in the water treatment industry.
- Wheels made in a higher Shore hardness mounted in steel-welded heavy-duty castors, offer minimal rolling resistance combined with an extremely high loading capacity in the docking platforms of the aeronautical industry.
- Wheels used in industrial lifts, elevators and escalators provide shock-absorbing cable guidance and an extremely high wear resistance.
- Glass & transport rollers designed for horizontal glass transport.
- Wheels reducing vibrations in chunking on conveyors and carousels.
- Customised wheels for chain conveying in the agriculture industry.
- Optimal mechanical properties, vibration reduction, wear resistance and chemical protection are the characteristics of the wheels made for the mining and tunnel drilling industry.
- Skid rollers for transport systems in the automotive industry.
- Precision guide rollers, adapted for fast moving transport over long distances in the baggage handling.
- High quality polyurethanes are also used for the production of technical moulded parts with applications in assembly (holders, positioning blocks, protective parts and impact blocks) or custom-developed applications for offshore applications:
 - tensile blocks for cable layers
 - wheels for carousels for cable layers
 - flume wheels
 - collars
 - spout nozzles for dredgers
 - pipe support static
 - pipe support dynamic with rollers/wheels
 - tube holders
 - safety gates

Material handling industry



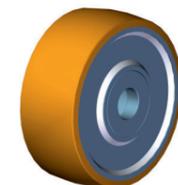
**AGV
AMR
SPMT**



Forklifts



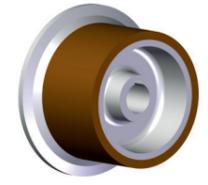
Heavy load transporters



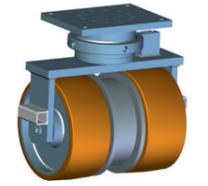
Machinery industry



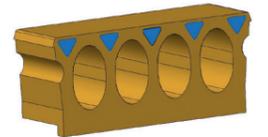
Automotive industry



Aeronautical industry



Concrete industry



Cranes & monorails



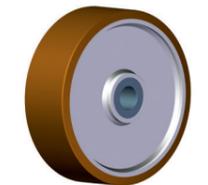
Elevators & escalators



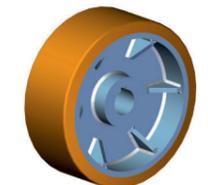
Glass transport



Mining and tunnel drilling



Waste treatment



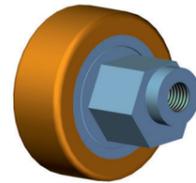
Machinery industry



Agriculture



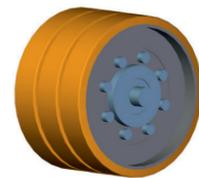
Baggage handling



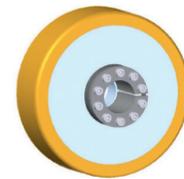
Construction of sewerage, water, pipeline, communication and power lines



Drum construction



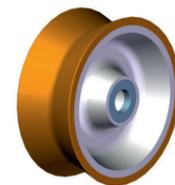
Food industry



Metal construction



Ship building and offshore



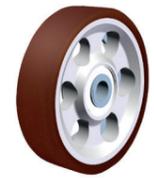
Water treatment



Theme Park industry



Fairgrounds



Theme parks



Maintenance, repair & Operations



All sectors



Retail

High-quality materials

Vulkoprin has developed a full range of top quality polyurethanes.

Vulkollan® has distinguished itself in recent decades as the "benchmark" material for heavy-duty wheels. To date, no other type of polyurethane succeeds in giving the same excellent mix of properties over a very wide temperature range.

With the **Printhane™** polyurethanes, Vulkoprin has succeeded in accentuating certain properties for specific applications, such as Printhane™ -X that was developed specifically for fast roller coasters, or Printhane™ GRIP to give more grip in drive applications.

Printhopan® is a high-quality thermoplastic polyurethane for guide rollers and a low-noise alternative to hard polyamide.



**The ultimate elastomer!
It stands for high quality,
long-lasting components.**

Vulkollan® is the benchmark polyurethane elastomer in the market, combining excellent mechanical properties for highest dynamical load bearing capacity and abrasion resistance. That is why you will find Vulkollan® in the most demanding applications. No other type of polyurethane offers an optimal mix of properties over a wide temperature range.



Vulkollan® The ultimate elastomer! It stands for high quality, long-lasting components.



Printhane™ is the generic name of the polyurethane elastomers developed by Vulkoprin for specific applications.

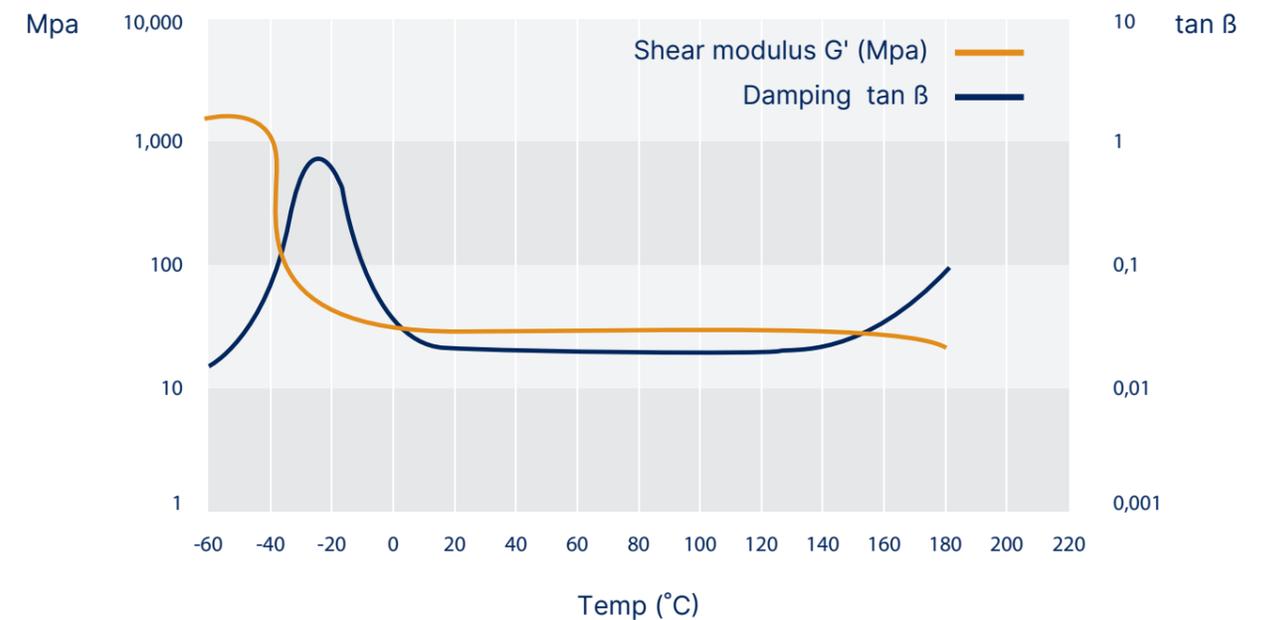


Printhopan® is a thermoplastic polyurethane. The elasticity of the Printhopan® TPU ensures that the guiding roller is silent and very durable. The TPU material is resistant to oil and grease and many chemicals.



Easyroll™ is a super elastic rubber in 65 Shore A.

Vulkollan 92 Shore A



The 8 family members of



Printhane™ is the generic name of the polyurethane elastomers developed by Vulkoprin for specific applications.

Hardness



Formulations from soft to very hard allow Vulkollan® to span the full spectrum between rubbers and thermoplastics. Thanks to this wide range of hardness, Vulkollan® can be found in a broad area of technical applications. Vulkoprin produces Vulkollan® ranging from 75 up to 97 Shore A.

Tensile strength



Vulkollan has very high values for tensile strength. Elongations up to 7 times the original length are needed before rupture of the specimen occurs. Together with high values for tear and tear propagation means Vulkollan® is virtually unequalled for wear and tear in conditions of dry or wet friction.

Damping



Good damping behavior, combined with the other physical properties, makes Vulkollan® the ideal material for anti-vibration elements.

Rebound resilience



The rebound resilience gives a measure for the elasticity of a material. Vulkollan® shows high and almost constant values over the whole hardness range between 0°C and 120°C. The higher the rebound resilience the less energy is transformed into heat by a deformation.

Chemical resistance



Unlike many other elastomers, Vulkollan® is highly resistant to many chemicals and, in particular, to mineral oils, petrol and benzene.

Compression set



Compression set is the amount by which a compressed elastomeric material fails to return to its original shape when the load is removed. The low compression set of Vulkollan® is a decisive factor behind its successful use for items such as wheels, damping and sealing elements.

Tear strength and tear propagation resistance



Vulkollan® has high values for tear strength and tear propagation resistance. This, together with the high elasticity, offers an exceptional wear resistance in dry and wet conditions.

Wear



Vulkollan®'s high resistance to wear ensures a long service life for expensive capital investments even under the harshest abrasive loads.

With the **Printhane™** polyurethanes, Vulkoprin has succeeded in accentuating certain properties for specific applications, such as Printhane™ -X that was developed specifically for fast roller coasters, or Printhane™ GRIP to give more grip in drive applications.



Printhane-C™ is conductive Vulkollan® and meets the standards EN12527 through EN12533. It finds application in environments with a higher risk of explosion, fire or electrostatic discharge (ESD).



Printhane-B™ is a polyurethane developed primarily for technical applications or in wheel applications that require more grip.



Printhane-X™ has been developed specially for applications with high speeds, which means it is well suited for all amusementpark- & roller coaster applications.



Printhane-R™ is a rigid polyurethane for use in applications that require thick-walled plastic parts that shows a high impact-resistance and elasticity and who are non-deforming. This material is a great alternative to parts in milled engineering plastics (polyamide, POM, ...).



Printhopan®

Printhopan® is a thermoplastic polyurethane. The elasticity of the Printhopan® TPU ensures that the guiding roller is silent and very durable. The TPU material is resistant to oil and grease and many chemicals.

A guide roller is a wheel or a roller that ensures that an object continues to follow the imposed path. The guide roller rolls in a profile or on a rail that determines the trajectory. When guiding, the forces on the wheel are usually limited. Impact loads or taking turns puts extra forces on the roller.

When a guide roller also has to carry the load, we are more likely to talk about load wheels and the load bearing capacity becomes a determining factor in the choice of materials Printhopan® or Vulkollan®.

Printhopan® : the other guide roller

- Temperature range: -20°C to +35°C, briefly upto +60°C.
- 59 Shore D (brown color) and 74 Shore D (light brown color).
- Noise-dampening
- Resistant to oils, grease and numerous chemicals
- Non-marking
- Resistant to wear
- Average load bearing capacity
- Low speed

Vulkollan® (NDI) guide roller: the ultimate elastomer

- Temperature range: -40°C to +85°C, briefly upto +120°C.
- 75, 80, 92 or 95 Shore A
- Noise-dampening
- Resistant to oils, grease and numerous chemicals
- Non-marking
- Very resistant to wear
- High load bearing capacity
- High speed

	Printhopan®											
	75	80	80	90	95	Grip	B75	B85	C	X92	X95	X97
Material
Manual
Driven
Heavy load
Long distance
Uneven floor
Wet floor
Noise reduction
Rolling resistance
Non marking
Ambient temperature < 0°C
Ambient temperature > 40°C
Wear
V-max. liftruck drive wheel m/s	-	12	16	25	30	25	12	-	25	30	-	-
V-max. liftruck load Wheel m/s	-	16	16	30	40	30	16	-	30	40	-	-
Extreme V
Hydrolysis resistance
Electrical conductive ISO2878

Table

Legend | • Basic | •• Good | ••• Recommended

The making of

a state-of-the-art production site

Customers, from various industries, can be certain that the entire wheel or wheel assembly is designed and manufactured by Vulkoprin.

Precision machines and powerful automation ensure smooth and timely production.

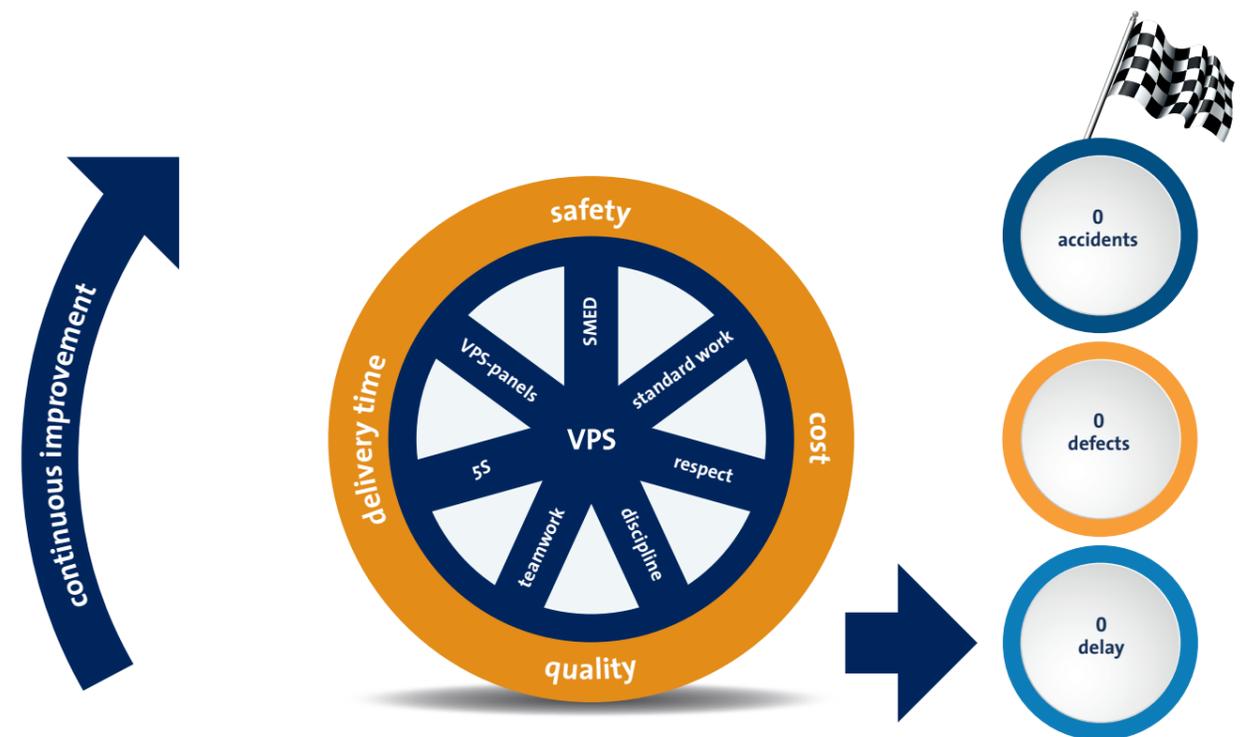
The polyurethane (PU) division can boast one of the most modern manufacturing facilities in the sector. Vulkoprin also has several casting lines at its disposal, so that dimensions and formulations can be tailored to the customer's requirements. A fully automated polymerisation process ensures PU of the highest quality.



Vulkoprin Production System (VPS)

The Vulkoprin Production System is a daily used system to organise the logistics and manufacture of wheels and castors in the production plant. It is a social-technical system that requires the involvement of all personnel to produce wheels and castors in time and at the lowest cost without compromising the high quality standards, the safety or the environment. The ground rules of zero accidents, zero defects and zero delays are combined in our VPS-wheel.

The highest goals are mentioned in the tyre specifications (safety, quality, delivery time and cost), the spokes give the wheel stability while the tools mentioned on the spokes give the system stability. Through continuous improvement the wheel rides towards our goals: zero accidents, zero defects and zero delays. The core values of teamwork, discipline and respect ensure that the wheel keeps spinning and that we succeed in our journey of continuous improvement.



Wheel definitions & the correct wheel choice

Wheel definitions (see 2D wheel definitions)

Wheel diameter

Outer diameter of the wheel.

Wheel width

Width of the wheel, measured on the rim*.

Hub diameter

Outer diameter of the hub**.

Hub width

Length of the hub**. The length can be larger, smaller, equal or asymmetrical to the wheel width.

Bearing seat

Space in which the bearing** is mounted.

→ Bore diameter

Diameter of the bore through the hub or inner diameter of the bearing. Determines which axle or bearing fits in the bore of the wheel.

→ Bearing seat dimensions

Depth of the bearing seat.

→ Fixing length

Width of the bearing assembly, including bearing and flange joints.

Bore hole diameter

Dimensions in which the axle fits (in the bore of the wheel or in a bearing**)

Flange width

Length between the hub** and the rim*.

Wheel centre

Part of the wheel, consisting of hub**, flange*** and rim*. The coating is applied to this.

Load capacity

Maximum load that can be carried by the wheel.

Wheel

A wheel is made of a tread/tyre, rim and hub. A wheel can be mounted in a housing. Depending on the type of housing, the result is a swivel or fixed wheel.

- The castors can swivel 360° around a vertical axis.
 - The fixed wheels, on the other hand, are fixed and ensure good directional stability.
- In most cases, 2 castors and 2 fixed castors are fitted.

A. Tread/Tyre

The outer part of the wheel that is in contact with the ground or roadway.

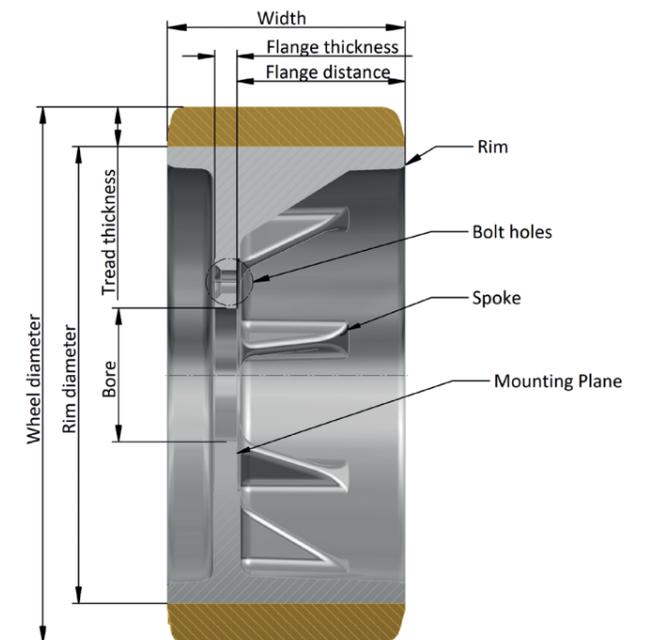
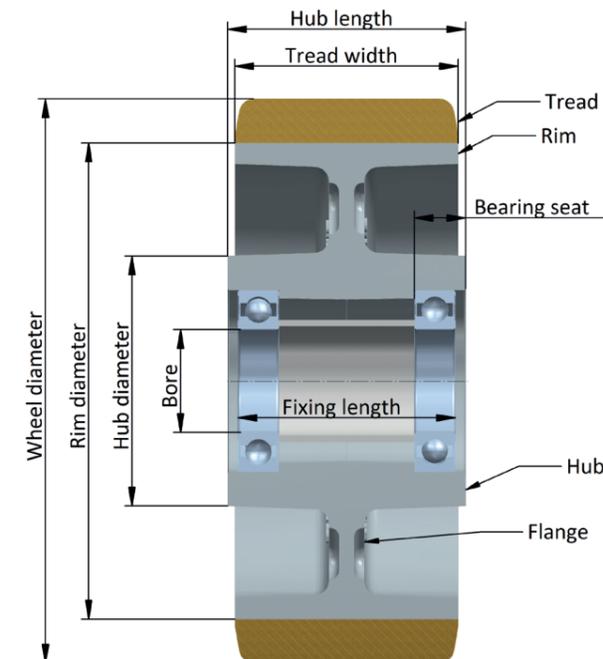
- Solid rubber rolls smoothly and silently. However, stiffness and load capacity are limited.
- Polyamide is shock and impact resistant, chemically resistant and wear-resistant. On the other hand, this is a non-elastic material.
- Polyurethane is extremely wear-resistant, sound-absorbing and has excellent rolling properties.

B. *Rim

A rim is the outer edge of a wheel on which the tyre lies.

C. **Hub

A hub is the central part of the wheel, for the attachment of a (drive) axle. A hub consists of a drilled workpiece in which, depending on the application, the hub is connected to the corresponding shaft via a bearing, a keyway, a clamping bushing or a fixed connection.



1. Bearing

(see wheel definitions in the picture) A bearing is a machine part that allows the movement of the wheel around its axle and reduces friction between the moving parts.

Plain bearing

Simple, largely maintenance-free bearing. Shock and impact resistant. Suitable for use in humid environments. For devices with low speed (max. 4 km/h) and for short distances. There is a sliding friction in the bearing.

Ball bearing

Sturdy, wear-resistant, largely maintenance-free bearings. Low bearing friction. Shock and impact resistant. Permanent lubrication. The most commonly used bearings for low speed devices (max. 4 km/h). Rolls smoother compared to plain bearings. Due to the roll contact, a ball bearing has a smoother ride.

Precision ball bearing

For speeds up to 20 km/h and heavier loads. Low rolling resistance when used.

2. Keyway

(see wheel definitions in the picture) A keyway is a machined groove along the length of the bore, which transfers the engine power to the wheel. No axial securing on the shaft!

3. Clamping bushing

(see wheel definitions in the picture) A wheel with a clamping bushing can be installed without the need of a press. By means of a conical bushing, the shaft and the bore are clamped together so that force can be transferred. Easy to assemble and disassemble. Also provides axial locking on the shaft.

D. ***Flange

The flange connects the hub and the rim. This is a disc where bolt holes may or may not have been fitted. The flange can be weighted with reinforcement ribs for better stability and strength. Steel welded wheels can be fitted with 2 flanges for more strength and weight reduction. A flange wheel is a wheel with a flange where attachment to a hub is possible.

The choice of wheel and castor primarily depends on:

1. The loadbearing capacity required

What does a wheel/castor have to carry?

- The load of a castor can be calculated using the following rule of thumb: $\text{load} = (\text{inherent weight} + \text{max. load})/3$.
- It is divided by 3 because on uneven flooring, even an item of equipment with 4 castors will only have 3 castors in contact with the floor, and these 3 then carry the full weight.
- This is a very general way to determine the loadbearing capacity. Ask your supplier for a detailed calculation.

The load capacities specified in our product range for wheels and castors apply for speeds of up to 4 km/h and an ambient temperature of 10°C to 60°C.

2. The floor conditions

Is the floor rough or smooth? Is the floor covered in tiles, concrete, or is it heavy-duty industrial flooring? In general, on smooth industry floors, you can use harder wheels (thin tread) while, on rough industry floors, soft wheels (thick tread) are better performing. Choose non-marking castors if you wish to avoid leaving rubber tread marks. If there are ground sills, extra loadbearing capacity must be factored in. Choose wheels with plain bearings and a stainless steel housing in food production areas or on wet surfaces.

3. The frequency of use

Is the equipment moved only on occasion, or all the time?

4. Environmental factors (temperature, including temperature fluctuations, chemicals, moisture and hygiene requirements)

Every site of use involves specific requirements. Moisture, cold, heat, temperature fluctuations, electrical conductivity and chemicals all affect the durability, rolling properties or the smoothness of motion.

5. Comfort

You can also choose the required level of comfort and smoothness. The material of the wheels determines the rolling properties and ride comfort.

- **Solid rubber** rolls smoothly and silently. The strength and load capacity are limited however.
- **Polyamide** is shock- and impact resistant, chemically resistant and hard-wearing. On the other hand it is a non-elastic material.
- **Polyurethane** is extremely wear resistant, noise absorbing and has excellent rolling properties thanks to its elasticity.

6. Specific dimensions such as wheel diameter, overall height and hub length, or plate sizes and assembly hole spacing for castors.

7. Quality of the used materials

VULKOLLAN® is one of the most powerful elastomers in the market. The excellent mechanical properties ensure a wheel with maximum dynamic load capacity and a long service life, even in difficult and demanding conditions.

PRINTHANE™ is the generic name for all Vulkoprin PU-elastomers developed specifically for extreme fields of application.

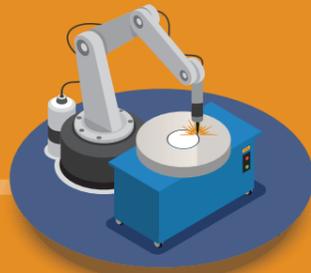
We are “equipped around the world”. Meet us at one of the exhibitions our contact our local certified dealer



1. FABRICATION AND MACHINING



COMPUTER CONTROLLED MACHINING OF CAST IRON, STEEL AND ALUMINIUM



ROBOT WELDING OF THE WHEEL HUB



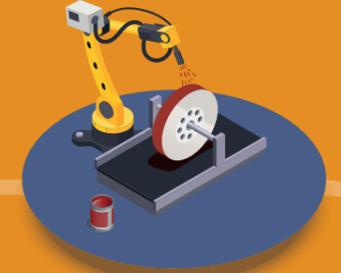
COMPUTER CONTROLLED MACHINING OF THE WHEEL HUB



ROBOTISED DEGREASING OF THE WHEEL HUB



ROBOTISED GRIT-BLASTING OF THE WHEEL HUB



ROBOTISED APPLICATION OF ADHESIVE PRIMER ON THE WHEEL HUB

2. SURFACE PREPARATION

4. POLYMERISATION



AUTOMATED PROCESS WITH CONTROLLED TEMPERATURE AND HUMIDITY



3. CASTING DEPARTMENT



DEMOULDING OF THE WHEEL



MACHINE-CASTING OF POLYURETHANE

5. FINISHING AND ASSEMBLY



COMPUTER CONTROLLED MACHINING OF THE WHEEL



ROBOTISED PAINTING OF THE WHEEL



ASSEMBLY OF BEARINGS, CLAMPING ELEMENT OR CASTOR

6. LOGISTICS



PACKAGING AND STORAGE



TRANSPORT AND DELIVERY



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