



## Your partner for wheels and casters for Automated Guided Vehicles (AGV) and Self-Propelled Modular Transporters (SPMT)



**Co-engineering and  
subassembly**

- 55+ years experience in high load & high speed applications
- standard and customised wheels, technical solutions for any machinery
- in-house design, engineering & manufacturing
- simulator facilities
- co-engineering with most important manufacturers
- global delivery



# Passion for polyurethanes

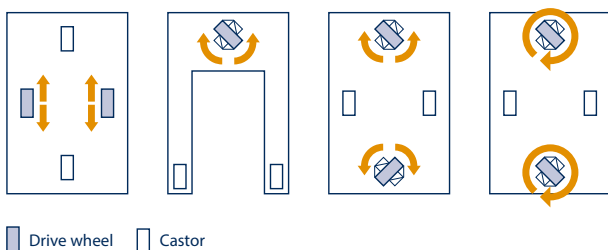
For more than 55 years now, Vulkoprin has been designing and producing a full range of polyurethanes that meet the requirements of the most demanding technical applications. For the production of high-quality wheels, guiding rollers, tyres and technical molded parts, Vulkoprin uses only the finest raw materials and can rely on a passionate team of experienced people.

## Vulkoprin trusted supplier for Automated guided Vehicles (AGV) and self-propelled modular transporters (SPMT)

An automated guided vehicle or automatic guided vehicle (**AGV**) is a mobile robot that follows markers or wires in the floor, or uses vision or lasers. They are most often used in industrial applications to move materials around a manufacturing facility or a warehouse.

Three types of **AGVs** are towing trucks, fork trucks, and heavy load carriers. Each is designed to perform repetitive actions such as delivering raw materials, keep loads stable, and complete simple tasks. Unlike human workers, **AGVs operate continuously only needing to stop to be recharged or repaired.**

**AGV** steering is controlled by differential speed control, steered wheel control or a combination of the two.



A self-propelled modular transporter (**SPMT**) is a platform vehicle used to move heavy loads on-site – typically during construction and maintenance projects.

The **SPMT** is especially useful wherever there's no access for a crane or truck. They allow the load to be moved in multiple directions, and over distances longer than is practical with a hydraulic gantry or skidding system.

The wheels on a **SPMT** include their own motor and can therefore be rotated individually. This provides impressive manoeuvrability and control.

## Vulkoprin AGV and SPMT competences

Vulkoprin designs and produces standard and customized wheels and castors that meets the most demanding **single drive and omni drive systems** (See standard line and customization in this folder).

The perfect combination of high elasticity and hardness in a large temperature range results in wheels with a low rolling resistance and high load capacity.

Today our wheels and castors are globally rolling in the **AGV** and **SPMT** applications of the major manufacturers as well as many niche players.

# QUALITY LABELS



**VULKOLLAN®** is one of the most powerful elastomers in the market. The excellent mechanical properties ensure a maximum dynamic load capacity and a long service life, even in difficult and demanding conditions. The ultra-high-performance elastomer can only be manufactured by Covestro licensed companies.

## Printhane<sup>B</sup>™    Printhane<sup>C</sup>™    Printhane<sup>R</sup>™    Printhane<sup>X</sup>™

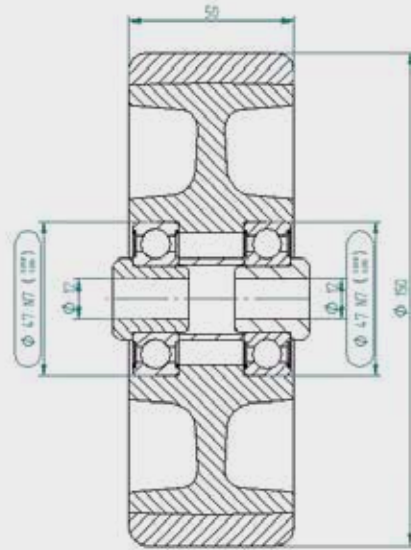
**Printhane™** is the generic name of the **polyurethane elastomers** developed by Vulkoprin for specific applications.

- **Printhane-B™** is a polyurethane developed primarily for technical applications or in wheel applications that require more grip.
- **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-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, ...).
- **Printhane-X™** has been developed specially for applications with high speeds, which means it is well suited for all amusement park- & roller coaster applications.

## Printhopan®

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





## The Vulkoprin Vulkollan® and Printhane-C™ AGV tread

The **Vulkollan®** tread material is particularly suitable for use in **AGVs**. It offers the optimal mix of mechanical properties engineered for 24/7 demanding application guaranteeing:

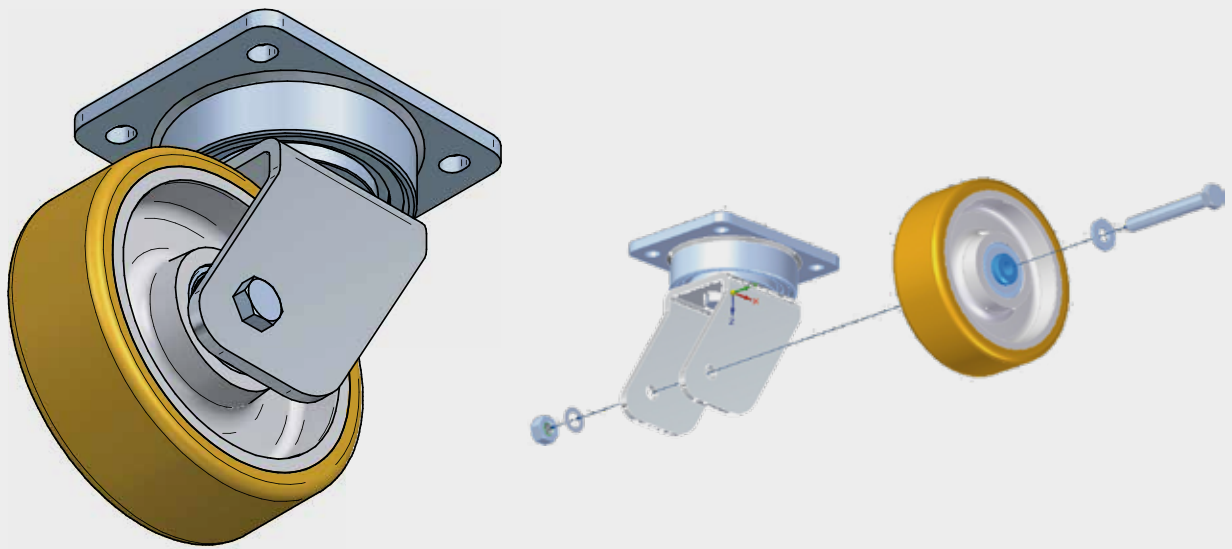
- minimal rolling resistance
- good traction
- high dynamic load capacity
- high cut and tear propagation resistance
- high rebound resilience
- energy-efficient for improved power usage
- non marking
- good floor preservation
- debris rejecting
- maximum lifetime

Hydrolysis resistant formulations for hot and humid environments, corrosion protected wheelcentres and alternative hardnesses for more traction and higher load capacities are available.

**Printhane-C™** is conductive Vulkollan® that meets the standards EN12527 thru' EN12533. An ideal solution for applications with a known risk of electrostatic discharge (ESD). The black tread is nonmarking and shows the same level of mechanical values as standard Vulkollan.

The polyurethane tire wheels are fitted with **precision ball bearings**. The core is available in **cast iron, steel or aluminum**. Wheel diameters start from **40 mm up to 1100 mm**, with load capacities exceeding **12 tons**.





## The Vulkoprin AGV Swivel castor-line

Our **AGV castor line** has been developed out of an existing heavy-duty application that has proven its performance since many years. Castor in welded steel, zinc plated. Oversized ball-bearing in the swivel head for smooth swiveling. Three type of castors with a load capacity till **20.000 kg**. Wheel sizes from **80 mm up to 200 mm**.

### Single source responsibility

Customers can be certain that the entire wheel or wheel assembly is designed and manufactured by Vulkoprin. They have the guarantee that the agreed configuration, from raw material to finish, has been followed up and inspected by Vulkoprin.

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

### Test facility

Besides the classical material tests and FEM analysis Vulkoprin has developed an in-house simulation program to design the correct wheel for the requested application.

Vulkoprin has several testbenches where wheels can be tested in different situations taking into account load deflection, rolling resistance, temperature profile, traction and slip. With loads up to 5 tons and speeds up to 8m/sec the majority of all AGV applications are covered. Predefined load cycles can be repeated until specification to guarantee the performance of the design.

### Customer cases

Vulkoprin is supplier to the global top **AGV constructors** as well as **specialized niche player**.

# Vulkoprin AGV robot wheel solutions

Standard-line Vulkollan® wheels up to 12.000 kg load capacity

Particularly suitable for intensive use at heavy loads on all type of hard industrial floors, under rugged circumstances, maintaining a low rolling resistance and high rolling comfort.

## Features

- high loadbearing capacity
- low rolling resistance
- perfect bonding
- low wear and tear
- long service life
- large temperature range
- non marking
- good floor preservation
- debris rejecting



# Series with cast iron core

Wheel with elastic tyre made of Vulkollan® with a cast iron wheel core with a plain H7-bore or with a keyway.



175-  
3875 kg



50-  
125 mm



65-  
400 mm

# Series with steel welded core

Wheel with elastic tyre made of Vulkollan® with a heavy duty steel welded core. Available with a plain H7-bore or with a keyway.



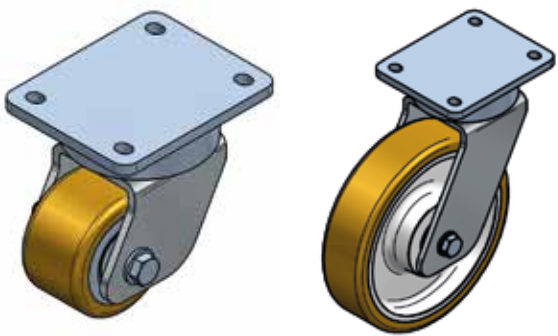
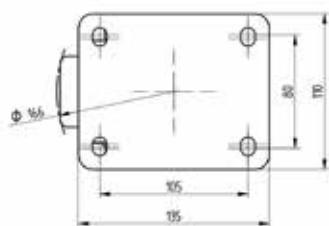
2000-  
12.000 kg



250-  
1100 mm

# The Vulkoprin AGV Swivel castor-line up to 20.000 kg load capacity

till 600kg load capacity



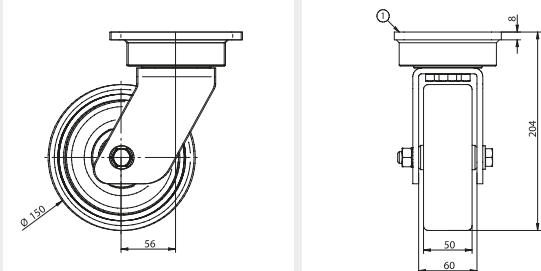
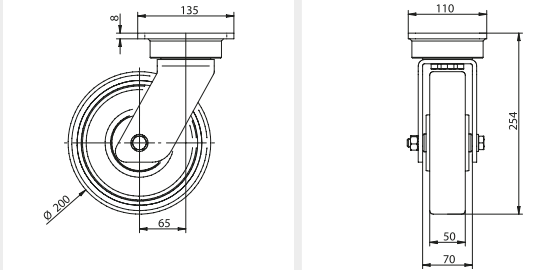
## Castor specifications

The light/medium duty castor wheels are suitable for standard transport applications with regular loads at normal use on smooth clean industrial floors. Low rolling resistance.

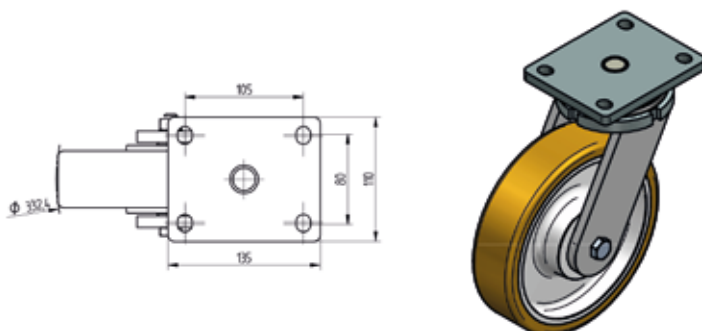
- Welded steel swivel
- Swivel head with oversized ball bearing
- Zinc plated
- Standard sizes
- Combined with other wheels, load bearing capacity till 1.000kg

Item	Type	Load capacity		
VKBK085050020	VKAGV85ML			400 kg
VKBK12505020	VKAGV125ML			500 kg



Item	Type	Load capacity	
VK BK150050020	VKAGV150ML		600 kg
VK BK200050020	VKAGV200ML		600 kg

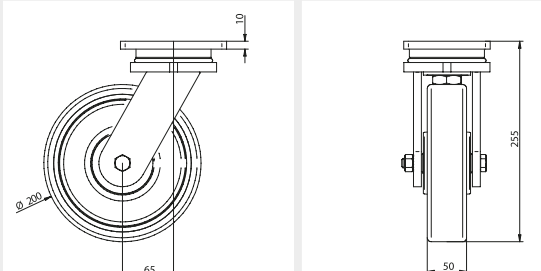
## till 1000 kg load capacity



## Castor specifications

The heavy duty castor wheels are suitable for extreme applications with regular peak-loads at intensive use where high requirements are made to performance and low rolling resistance.

- Welded steel swivel
- Swivel head with steel hardened axial grooved ball bearing and a steel hardened tapered roller bearing
- Zinc plated, on request also grey (RAL 9007) lacquer coated
- Different dimensions on request

Item	Type	Load capacity	
VK BK200MPN	VKAGVHL		1000 kg

till 20.000kg load capacity

# Customized Vulkollan® and Printhane™ wheels according to your specifications

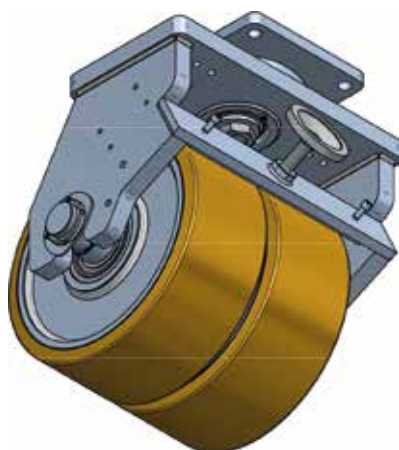
For every **AGV** application Vulkoprin can **design, produce and test** the optimal wheel, in small or large volumes.

E.g., for light and medium duty applications where elasticity, driving comfort and cushioning is an important requirement or for extreme driving-applications at intensive use where high requirements are made to rolling comfort and low rolling resistance.

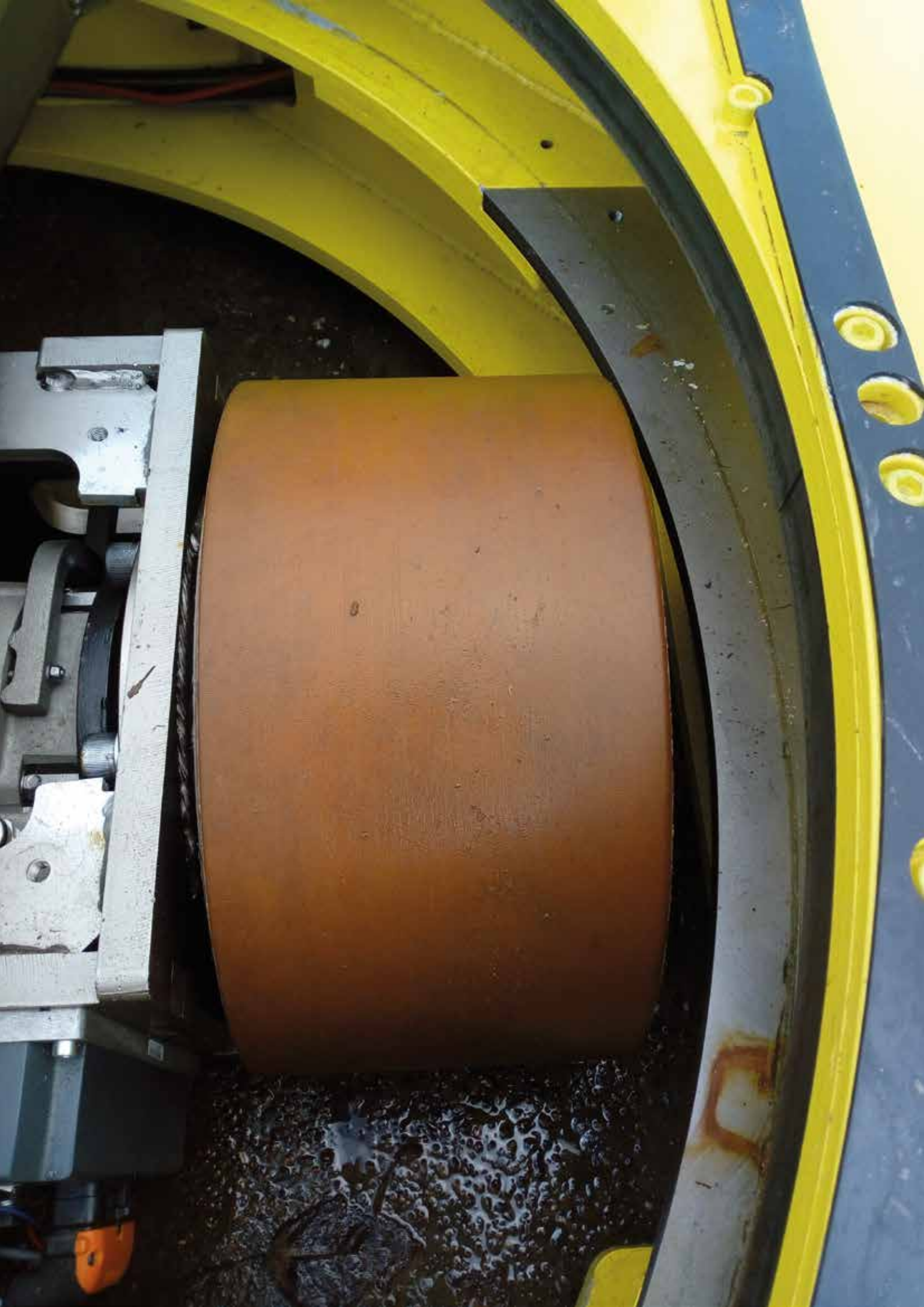
High loads, long distance runs, frequent swiveling, aggressive environments... **ask our engineers to exchange their AGV wheel experience.** Wheel centers and PU covers are engineered and optimized to your application to guarantee an optimal 24/7 operation.

Wheel diameters up to **1100** mm with load bearing capacity of **12.000** kg. Customized castors up to **20.000** kg.

## Examples of customized wheel and co-engineering



An electric AGV motor with a wheel hub transmission equipped with a running wheel with a Vulkollan® tire and a electromagnetic brake.







## Material handling industry

## Theme park industry



## Machinery industry



## Maintenance & Repair

