

SOLUTIONS FOR ROBOTICS (AGV, AMR) ROBUST, SAFE, EFFICIENT



TENTE

BETTER MOBILITY. BETTER LIFE.



WHEELS AND CASTORS FOR YOUR AGV APPLICATIONS

Due to our experience in intralogistics, we understand the needs of your industry. We support you as a reliable partner when it comes to maintaining global supply chains and minimising costs. In this process, we pay particular attention to meeting the highest quality standards. Additionally, our products can contribute to increasing your productivity while improving occupational safety. Above all, we are committed to a clear goal: optimising your logistics processes with our customised mobility solutions.

RESPONDING TO CHANGES

At TENTE, we have been partnering with G-DOK for several years now. This manufacturer mainly produces high-performance castors in the field of AGV (Automated Guided Vehicles) / AMR (Autonomous Mobile Robots). G-DOK is an established brand in the market and has a high quality standard regarding its own products and its cooperation partners. For this reason, G-DOK has chosen TENTE as a cooperation partner.

In this cooperation we operate with products from G-DOK's own brand "FOOT MASTER®". These original FOOT MASTER® and AGV/AMR castors are mainly supplied in Europe. The aim is to improve the performance, directional stability and durability of AGVs and AMRs.

CASTORS AND WHEELS FOR YOUR INDIVIDUAL NEEDS

As a manufacturer of castors and wheels, we focus on your requirements. After all, when it comes to improving mobility, we constantly operate with great precision. Tailor-made. For this, we embrace your perspective right from the beginning – and thus take a holistic view of your specific conditions. This way, our products can be integrated into your systems and processes seamlessly or even emerge from them. If you wish, we will also design customised mobility solutions for your applications in close cooperation with you.

You are invited to take a moment and learn more about our developments on the following pages – feel free to contact us at any time.

LESS DOWNTIME – DUE TO FULL TRACK STABILITY

When it comes to intralogistics, every second and every resource counts. This is why we support you with mobility solutions. They help you save time, effort, material costs and increase efficiency in a significant way. Thanks to optimised swivel behaviour. Thanks to smooth changes of direction. Thanks to levelling out uneven floors. Thanks to continuous ground contact. And especially thanks to reduced vibrations and outstanding durability.

EFFICIENT AND PREMIUM

Our castors and wheels are made of high-quality materials and components. These are characterised by extraordinary resilience. Thus, they ensure durability and significantly reduce your costs for reparations and maintenance – such as replacing parts. This is because castors like the TENTE Zeta, TENTE Kappa and TENTE Kappa flex allow you to replace individual components instead of replacing the entire castor.

You only wish to replace the housing or the wheel? No problem!

We will be happy to repair or renew your high-quality TENTE castors for you. This way you can be sure to have your castors in good shape again for further use.

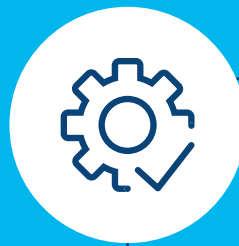
ALWAYS ON TRACK

The optimised offset, the special elastic spring, the tilting function of the wheel axle and the double swivel head of AGV casters® in combination with our mobility solutions are the main factors that ensure a remarkable track stability. The optimised offset is the key component in the robotics industry of the future.

Since AGV environments are becoming more versatile and popular, the requirements for the castors used for an AGV are also becoming more demanding. For this reason, the expertise of G-DOK and TENTE castors results in perfect products for automated guided vehicles.

With our trend-setting developments, our commitment to service and our innovative drive, we continue to set new standards in the industrial field.

KEY COMPONENTS



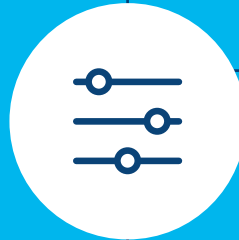
SYSTEM

Computing hardware for installing programmes and applications.



NAVIGATION

Means of acquiring and transferring data for directional guidance.



DRIVING CONTROL

Sends commands and monitors feedback in a continuous loop.



CASTORS

One of the key components to prevent operation failure.



STEERING

The most important element as it is the mechanical assembly of components to control direction.



TYPICAL CHALLENGES

AGVs are automated vehicles that follow a line marked on the ground. Sometimes they move with the help of radio waves, cameras, magnets or lasers.

They are often used to transport heavy loads. Increasingly, however, they are also used for small and light loads, such as in factories, warehouses and in distribution.

Even though AGVs are becoming more and more popular, if the wrong castors are used, there are some problems that can lead to downtime and safety risks.

OFF-TRACKS DUE TO EXTENDED OFFSET

Especially with heavy loads, the AGV and the cargo can easily vibrate. This makes it particularly difficult for AGVs to stay on track.

Castors from G-DOK combine high load capacities, an optimised offset and a special swivel bearing design. This combination enables vehicles to stay on track and prevents emergency stops due to off-tracks when changing direction.

VIBRATIONS ON UNEVEN GROUND

AGVs are usually constructed with four castors at the corners. In case of uneven ground, it may occur that one of the four castors briefly loses contact with the ground. As a result, the vehicle tends to leave its given track and comes to an immediate stop. Castors from G-DOK provide a solution to this problem. Special spring-loaded castors ensure continuous ground contact of all four castors. This keeps the vehicle on track at all times. Even driving over light obstacles, such as edges and gaps around lifts, will not throw the AGV off track. In addition, these castors reduce vibrations very effectively and thus protect your valuable and fragile cargo.

DOWNTIMES DUE TO POOR SAFETY BACK-UP OF THE CASTORS

The rule for AGVs is that even the smallest disruption can lead to long-term downtimes and delays in the process. The success of these vehicles therefore depends on a small detail: a reliable castor. This small but essential detail can prevent downtimes and ensure a smooth movement. For this, G-DOK in combination with TENTE, offers a wide range of castors that guarantee smooth running of AGVs and their loads.

APPLICATIONS



LONGER DURABILITY, REDUCED DISRUPTIONS AND LESS DOWNTIME

In contrast to transport trolleys, which are pushed by people in intervals, AGVs are in continuous use 24/7. Castors and wheels for AGVs wear out quickly due to their permanent use and can thus decrease occupational safety and cause accidents at work. Solutions are needed, and these solutions are durable castors.

For this reason, the cooperation with G-DOK and TENTE is of great value, because as a castor manufacturer we have a great influence on the mobility of AGVs. The smallest castor is crucial for everything to work.

Durable AGV castors lead to increased occupational safety, productivity and thus significant cost savings.

OPTIMISED SWIVEL RADIUS

 **250 - 630 kg**
 **130 - 215 mm**
 **75 - 150 mm**

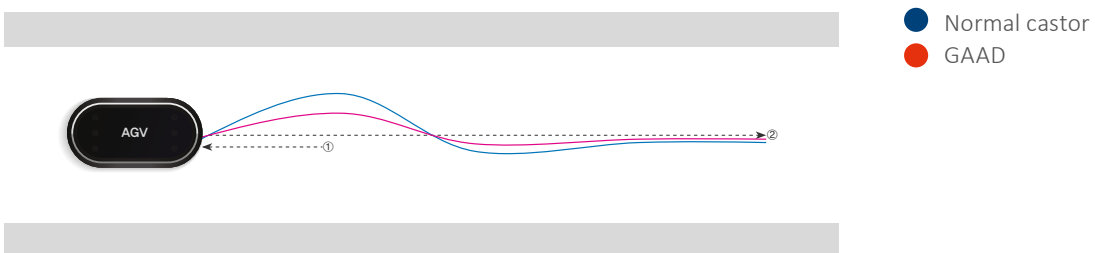
The series GAAD applies two swivel axes with different swivel radius and has the function to automatically optimise swivel radius by aligning the swivel axis on its own according to the moving direction in forward/backward motion.

series: GAAD



- 24-hour permanent use**
 These castors maximise the operation providing cost savings from 24-hour continuous use and increased productivity.
- Low overall height**
 The low overall height of the castors makes it easy to drive underneath and thus also minimises the overall height of the AGV.
- Off-track issues significantly reduced**
 The optimised offset and the patented automatic aligning function solves off-track issues.
- Autonomous transport**
 Optimised for the high demands of automated guided vehicles, durable swivel and wheel bearings for long-lasting driving without interruptions.
- Optimised manoeuvrability**
 Twin wheel castor with high manoeuvrability due to differential effect.

MOVING DIRECTION OF THE AGV BETWEEN A NORMAL CASTOR VS GAAD SERIES

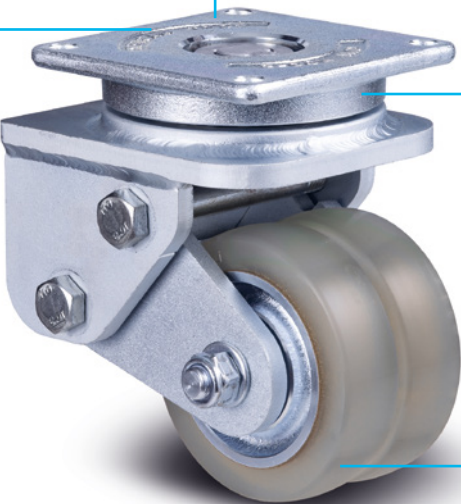


SHOCK ABSORPTION

 **250 - 630 kg**  **130 - 210 mm**  **75 - 150 mm**

The advantage of the GASD series with shock absorbing functions is that it can absorb even repeated fine shocks caused by movement on an uneven floor. Due to the special elastic rubber spring, vibrations can be absorbed. The GASD series features a 10 mm spring section providing permanent contact with the floor. This reduces the risk of abrupt stops generated during a change of direction.

series: GASD




24-hour permanent use
These castors maximise the operation providing cost savings from 24-hour continuous use and increased productivity.

Low overall height
The low overall height of the castors makes it easy to drive underneath and thus also minimises the overall height of the AGV.

Perfect swivel-resistance
Due to the differential effect of twin wheel construction.

Low-vibration transport
Extra soft wheels with good shock absorbing properties.



Contact with the floor

LEVELLING UNEVEN FLOORS

📏 250 - 630 kg 🔄 123 - 200 mm ⌀ 75 - 150 mm

The wheel axle of GATD has a tilting structure that tilts freely in the range of $\pm 5^\circ$ from its central axis according to the flatness of the floor. This flexibility ensures that GATD always keeps contact with the floor, causing smooth AGV movement and protection of the loaded cargo when changing directions. The series GATD has a bigger self-compensation effect than the standard twin wheel castor, to prevent AGVs from deviating from the track.

series: GATD

Low overall height

The low overall height of the castors makes it easy to drive underneath and thus also minimises the overall height of the AGV.

Autonomous transport

Optimised for the high demands of automated guided vehicles, durable swivel and wheel bearings for long-lasting driving without interruptions.

24-hour permanent use

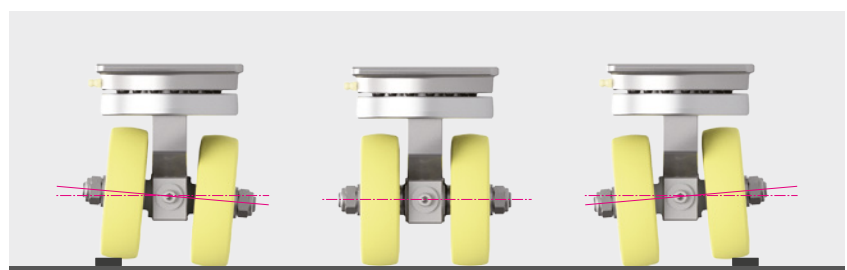
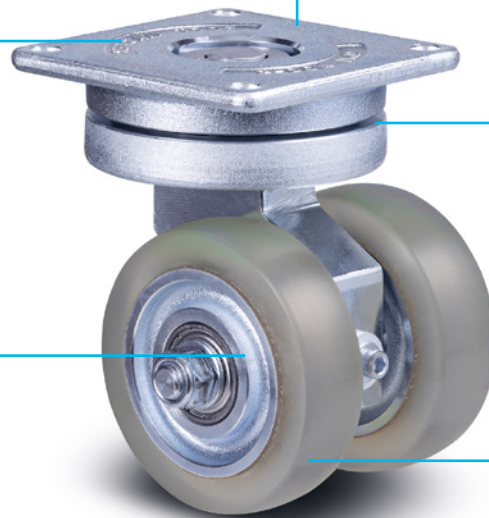
These castors maximise the operation providing cost savings from 24-hour continuous use and increased productivity.

Off-track issues significantly reduced

The tilting function and the bigger self-compensation effect solve off-track issues.

Regulated ground contact

Permanent contact with the floor due to tilting functions.

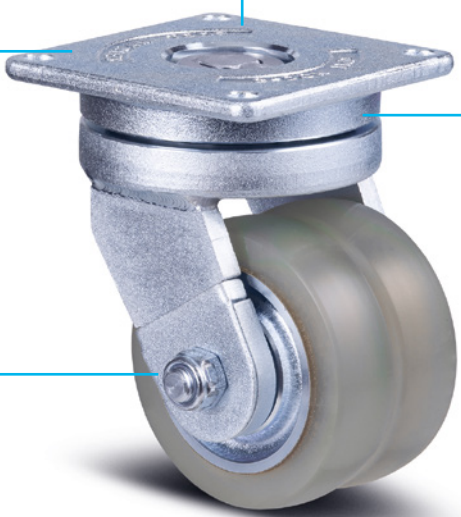


MORE DIRECTIONAL STABILITY

 **250 - 630 kg**  **123 - 200 mm**  **75 - 150 mm**

The series GAGD endures heavy weight, and provides the best solution by setting an optimal offset which is smaller than the offset of a standard castor to prevent abrupt stops when changing direction. In addition, AGVs swing as much as the offset of the castor when changing directions. This swing phenomenon appears more prominent as the weight is heavier. This leads AGVs away from the regular position.

series: GAGD



- 24-hour permanent use**
These castors maximise the operation providing cost savings from 24-hour continuous use and increased productivity.
- Low overall height**
The low overall height of the castors makes it easy to drive underneath and thus also minimises the overall height of the AGV.
- Off-track issues significantly reduced**
The optimised offset solves off-track issues.
- Autonomous transport**
Optimised for the high demands of automated guided vehicles, durable swivel and wheel bearings for long-lasting driving without interruptions.



PERFECT SWIVELING

 **200 kg**  **115 mm**  **75 mm**

The series GAPHD is designed to endure heavy loads despite its small wheel size by applying polyurethane with shore hardness A95. In addition, the polyurethane wheel with good repulsive elasticity protects AGVs from instantaneous shocks coming from damaged floors. GAPHD guarantees fast swiveling and durability.

series: GAPHD



OPTIMISED SWIVEL RADIUS

 **100 kg**  **102 mm**  **75 mm**

The series GAPC has excellent durability in the AGV environment by applying bearing steel with higher strength than standard structural steel in the swivel head. In addition, GAPC shows very soft motion via minimisation of friction through tolerance control of the swiveling parts.

series: GAPC

Lowest overall height

The lowest overall height of the castors makes it easy to drive underneath and thus also minimises the overall height of the AGV.

Autonomous transport



Optimised for the high demands of automated guided vehicles, durable swivel and wheel bearings for long-lasting driving without interruptions.

24-hour permanent use

These castors maximise the operation providing cost savings from 24-hour continuous use and increased productivity.

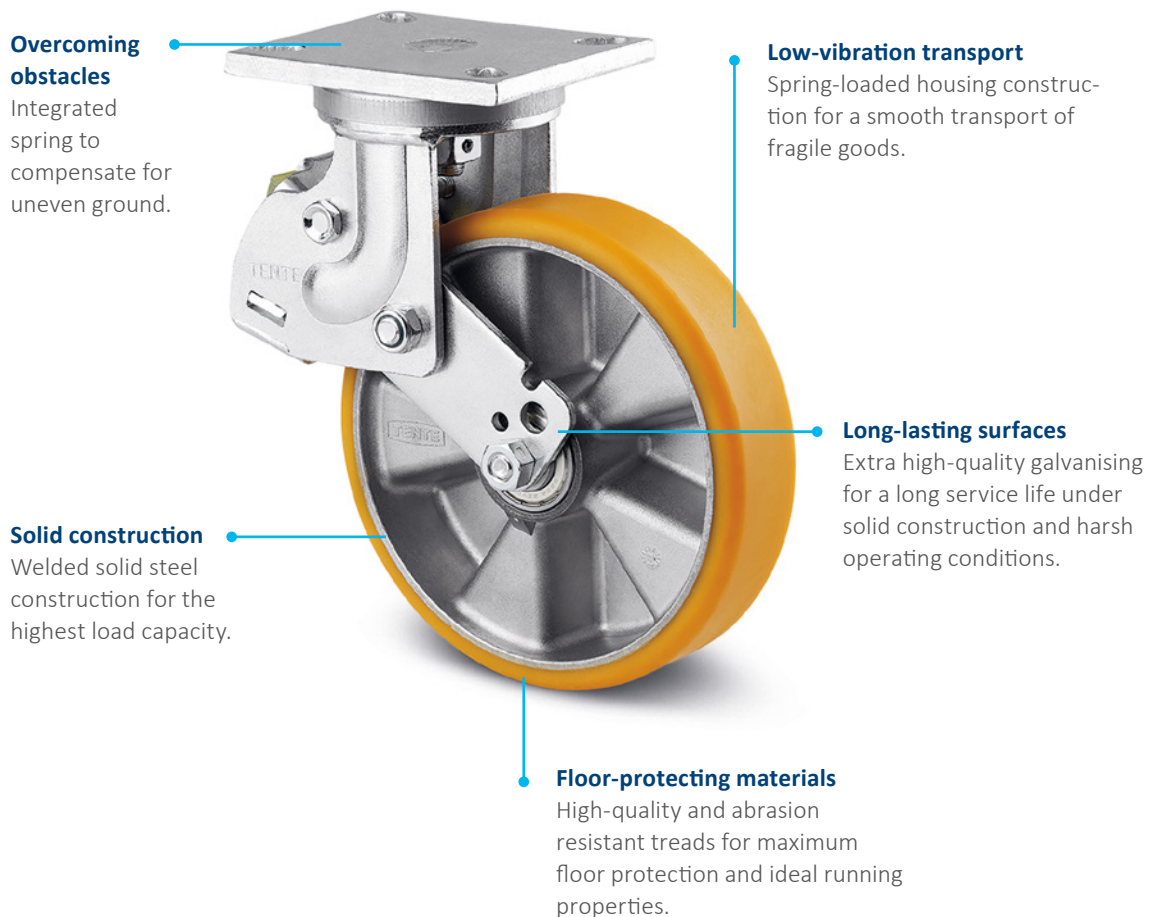


SAFE TRANSPORT

 **360 - 750 kg**  **160 - 200 mm**

With Kappa flex, your goods are transported safely. The spring-loaded housing construction and additionally integrated springs to compensate uneven ground result in a system that is perfectly and flexibly suited for every requirement and load.

series: Kappa flex



UNINTERRUPTED PROCESSES

📏 **2.000 - 22.500 kg** 📏 **170 - 570 mm** 📏 **100 - 600 mm**

We offer a wide range of heavy-duty castors. The castor with the highest load capacity is our Omikron for the safe transport of heavy loads. Extremely reliable due to solid construction and high-quality polyurethane treads.

series: Omikron

Quick maintenance
Swivel bearings lubricated with durable grease and fitted with grease nipple for easy maintenance.

Long-lasting surfaces
Extra high-quality galvanising for a long use under harsh operating conditions.



Protecting floors with load distribution

Up to four wheels per castor distribute the load and minimise floor impressions.

Optimised manoeuvrability

Twin wheel castor and four wheel castor with high manoeuvrability due to differential effect.

CUSTOMISED SOLUTIONS FOR DEMANDING APPLICATIONS

Mecanum wheels are custom-made. Based on your requirements, we develop the right wheel and can use different materials and diameters to realise the best solution.

series: Mecanum

Precise bearings

Due to the complex functionality, we work with very precise bearings.

Customised design

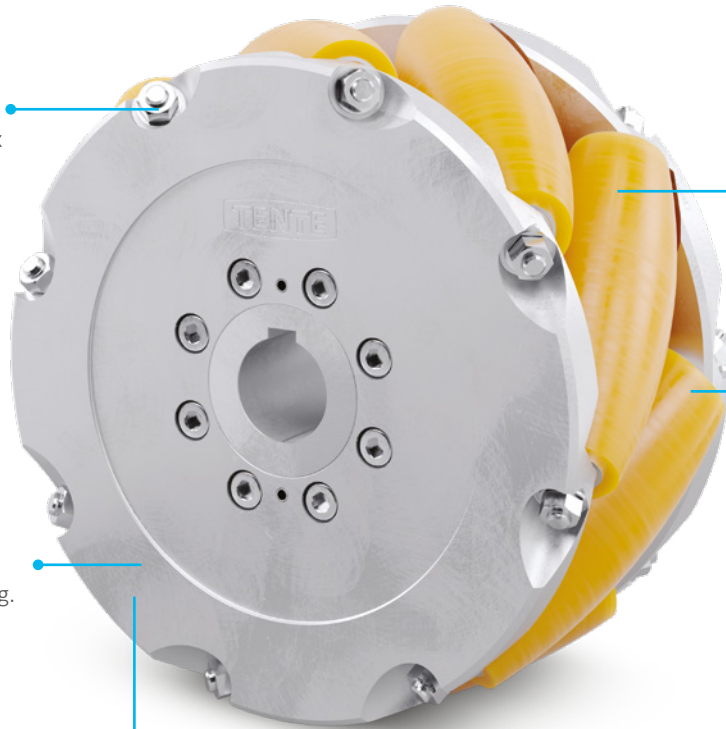
Individual design e.g. customer logo.

Diameters

Different diameters and dimensions are possible.

Load capacity

Different load capacities are possible depending on the diameter.



High-Tech Polyurethane

We can supply different high-performance polyurethanes such as Novatech, Ultratech and Ultratech plus. Find more information on this in our flyer:

www.tente.com/Polyurethane_solutions



PREMIUM POLYURETHANE FOR YOUR APPLICATIONS NOVATECH & ULTRATECH

Developed for your toughest requirements in direct accordance with the market. Novatech, the standard quality, already impresses with its high abrasion resistance under extreme conditions. Ultratech plus, our new developed high-performance material, excels in fast acceleration and deceleration. This material performs exceptionally well in benchmarks with standard premium polyurethane materials. All materials qualify for applications as drive, running and load wheels.



Novatech for standard applications

Highly resilient classics with cast polyurethane coating. Wear-, tear- and cut-resistant material, non-marking and grease resistant. Available as antistatic or ESD conform version in different shore hardnesses. Our allrounder for industrial applications.



Ultratech for high speed and long distances

Outstanding performance for industrial applications. Newly developed premium polyurethane with lower rolling resistance for better mobility. Specially engineered for running at high speed with high loads. Available in different shore hardnesses.



Ultratech plus is specially featured for intensive uses

Optimised for high load, high speed, strong acceleration, deceleration, and frequent direction changes. It offers better performances than all other polyurethane quality tested in laboratories or by end users and provides more efficiency and less maintenance. Special features: reduced heating during usage for a longer lifetime.

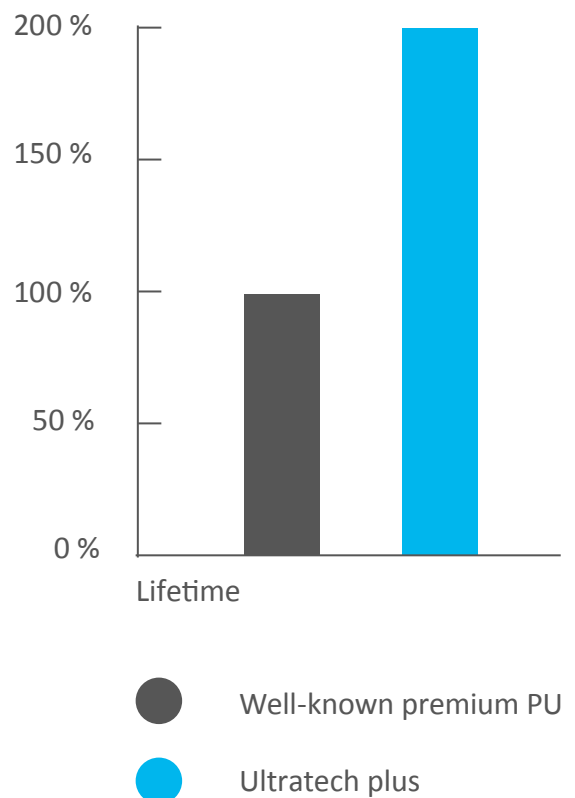
ULTRATECH ELASTOMERS ADVANTAGES

Worn or unsuitable wheels impact working conditions and productivity. Therefore, it is essential to choose high-performance equipment!

Our premium polyurethane Ultratech plus is the ideal material to prevent any down-times in your logistics department. Materials and processes are designed to support extremely high speeds and exceedingly high loads. Thanks to the Ultratech plus material and its wear-resistance as well as its long stability, we can ensure a long lifetime on your devices. The stability of this material ensures a safe service. It will reduce the maintenance costs dramatically and it will improve global efficiency. This elastomer has an excellent heat build-up resistance, which is beneficial in extreme conditions: strong acceleration or deceleration, high speed, high load, 24/7 use.

In other words, our Ultratech plus wheels require a maintenance minimum and provide a performance maximum!

Lifetime Benchmark



YOUR BENEFITS

- Increased efficiency
- Improved availability
- Individual product development
- Lower maintenance costs
- Reduction of downtime
- 24/7 use



OUR CHALLENGE: SATISFY THE CUSTOMER REQUIREMENTS

For most special applications which incorporate our Ultratech wheels, we start the development based on the requirements of the customer. Thanks to our expertise, the best possible solution is proposed and implemented accordingly. We provide technical support with a team of experts, made up of experienced designers, test engineers, and chemists in order to create the perfect solution and to meet the requirements of the customer. Many parameters can be set up and adjusted in order to get the best possible solution: friction, compression, dimensions, hardness, rebound resilience, antistatic options, or hydrolysis resistance can be involved in the development. This flexibility is the key to provide the best possible final product in a cost-effective way.



"What convinced us was the durability of the special castors – as well as the know-how of our partners at TENTE."

Maarten Van Loovren, General Manager, AVT Europe until 2020

Read more about the reference:
www.tente.com/avt-europe

SUSTAINABILITY IS VERY IMPORTANT TO ALL OF US

Therefore, we are happy to coat your rims with fresh polyurethane. In many cases, used rims can be reused again. All you have to do is send us your discarded wheels and we will take care of the rest.*

- Removal of the old tread
- Inspection of the rim for microscopic cracks
- Application of a new polyurethane tread

Save money and protect the environment.
Please do not hesitate to contact us.



* Please contact us. We will be happy to advise you!

FULL SERVICES WITH TENTE

1

CONSULTATION

What challenges do you face? What would you like to improve? The safety at work? Efficiency? Productivity? Or all of the above? Our experts listen carefully and set the initial goals together with you.



2

ANALYSIS

With the integration of the necessary specialists, we get a precise picture of your current situation. Our experts look at all the decisive influencing factors and focus on your individual needs - starting with the requirements in terms of product specifications, through system integration to delivery times. In the process, the analysis is carried out in a very specific way: most certainly as a holistic concept.



3

PRESENTATION OF THE IDEA

We develop a concept idea for a mobility solution that is precisely aligned with your requirements. We present this to you in detail in a presentation and discuss the next steps.



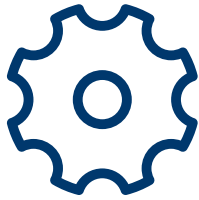
6



FINAL SOLUTION

We deliver the finished mobility solution and are of course also happy to provide you with comprehensive support afterwards – for example with our all-round carefree service package. Contact us, we will advise you individually.

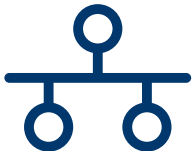
5



SAMPLE / PROTOTYPE

You receive an initial prototype or a certain number of sample castors from us. You can test these extensively in connection with your application before we finally complete the development together.

4



COLLABORATIVE DEVELOPMENT

The idea becomes a reality: In close coordination with you, we realise the planned project. In the process, we use our entire development knowhow – and implement the joint concept.

DIVERSITY WITH A SYSTEM: OUR CASTORS

Each of our product families is united by specific criteria. Therefore, the focus can be on a high design standard, a special area of application or an exceptional load-bearing capacity.

Based on this defined property profile, a system of design options is available for each individual model – from proper scaling and technical specifications to the required equipment.

Contact us for more information: www.tente.com

E-Drive



⌀ 125 mm

Alpha



⊃ 70 - 500 kg
⌀ 80 - 200 mm

Delta



⊃ 300 - 600 kg
⌀ 125 - 200 mm

Delta twin



⊃ 600 - 750 kg
⌀ 125 - 200 mm

Zeta



⊃ 300 - 800 kg
⌀ 125 - 250 mm

Kappa



⊃ 300 - 3.000 kg
⌀ 80 - 300 mm

Kappa flex



⊃ 360 - 750 kg
⌀ 160 - 200 mm

Omikron



⊃ 900 - 22.500 kg
⌀ 100 - 600 mm

AGV castor



⚖ 250 - 630 kg
⊘ 75 - 150 mm

Radiata



⚖ 1.200 - 1.500 kg
⊘ 80 mm

Scout



⚖ 150 - 350 kg
⊘ 160 - 200 mm

Linea industrial



⚖ 120 - 150 kg
⊘ 100 - 150 mm

Integral



⚖ 100 - 150 kg
⊘ 100 - 200 mm

Integral twin



⚖ 125 - 250 kg
⊘ 100 - 150 mm

Forma



⚖ 125 - 150 kg
⊘ 125 - 150 mm

Aviana care



⚖ 100 kg
⊘ 75 mm

Aviana



⊘ 75 mm

Agila



⚖ 40 - 100 kg
⊘ 50 - 150 mm

Agila twin



⚖ 50 - 100 kg
⊘ 50 - 75 mm

Stora



⚖ 60 - 160 kg
⊘ 75 - 160 mm

Mono



⚖ 30 - 70 kg
⊘ 50 - 100 mm

Levina



⚖ 60 - 100 kg
⊘ 75 - 150 mm

Linea



⚖ 40 - 150 kg
⊘ 50 - 150 mm

Anika



⚖ 40 - 50 kg
⊘ 55 - 75 mm

Lumina



⚖ 10 - 100 kg
⊘ 35 - 75 mm

Stylea



⚖ 40 - 100 kg
⊘ 35 - 100 mm

Smiles



⚖ 40 kg
⊘ 50 mm

Compacta



⚖ 10 - 55 kg
⊘ 14 - 50 mm

EXPERTISE THAT INSPIRES

CONTACT US

We are a globally operating company supporting you on five continents. This means on-site support with service on a level playing field - along with in-depth knowledge. Additionally, our solution experts will advise you on the best mobility concept for your needs. Go here to find your nearest TENTE location:

www.tente.com/locations

OPTIMISE YOUR EFFICIENCY

Our intelligent mobility solutions help you save time, effort, energy, and operating expenses. This allows you to improve your operating methods and working conditions, thereby optimising your processes and ensuring higher productivity, profitability and safety. Ask for our solutions catalogue or read about how our customers benefit from our tailor-made solutions on our website:

www.tente.com/solutions

SAVE DEVELOPMENT TIME

On our website you will find technical drawings, product data sheets and 2D and 3D CAD files in various formats:

www.tente.com/aviana

GET MORE INFORMATION

In addition to our informative website, you can easily download various catalogues and brochures on mobility solutions, customer references, and much more:

www.tente.com/download



ER LIFE.

ET



www.tente.com



PRODUCTIVITY



SAFETY



DESIGN



DURABILITY



ENVIRONMENT