



FORGED WHEELS, AXLES AND WHEELSETS FOR ROLLING STOCK

OUR BUSINESS SPIRIT : INNOVATION & PERFORMANCE

www.valdunes.com



VALDUNES INDUSTRIES'

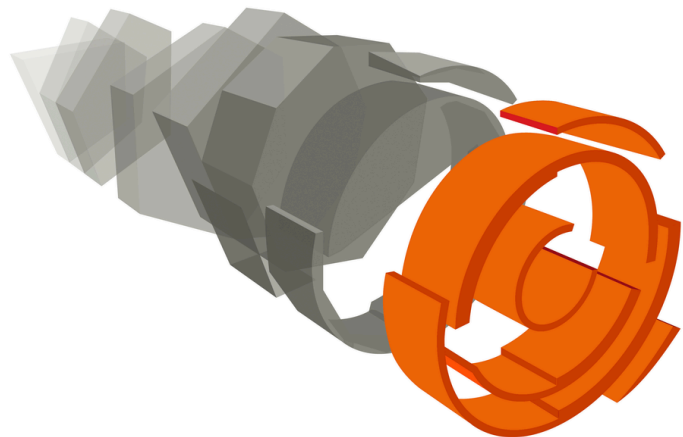
**Business Spirit of Innovation
and Performance is founded
upon our company values :**

- Respect
- Security
- Customer satisfaction
- Responsibility
- Progress

SUMMARY

DESIGN
EXPERTISE
EWC
PARTNERSHIP
WORLDWIDE
WHEELS
TESTING
QUALITY
FLEXIBILITY
AXLES
HEAVY HAUL
SERVICES
SAFETY
HIGH SPEED
HIGH-TECHNOLOGY
LOW NOISE
STEEL GRADES
RESEARCH
DEVELOPMENT
LRV
WHEELSETS
HIGH-PERFORMANCE

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“**VALDUNES INDUSTRIES** is
one of the world's leading
manufacturers and suppliers
of forged wheels, axles and
wheelsets for rolling stock”

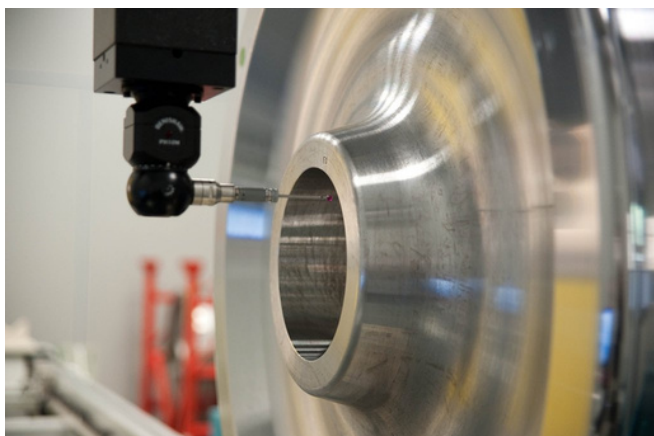
GENERAL PRESENTATION

BELONGS TO A LISTED GROUP

The creation of VALDUNES INDUSTRIES in 2024, following the takeover of MG-VALDUNES by the listed Europlasma's group, is a new chapter in our long history of wheel, axle and wheelset manufacture. **With over 175 years of experience, VALDUNES INDUSTRIES has a worldwide reputation** for the supply of high performance, high quality products and excellent service.

STATE OF THE ART PRODUCTION

The takeover by Europlasma in 2024 came **with an investment plan, valued at 35 mEUR over 3 years**. This will mean that VALDUNES INDUSTRIES always has state of the art equipment, will increase capacity, improve productivity, reduce delivery lead times and cement VALDUNES INDUSTRIES position as the rolling stock wheel, axle and wheelset solution provider **giving the best quality, performance, innovation and service**.



PAST GLORIES, FUTURE SUCCESS, INTERNATIONAL PRESENCE, OUTSTANDING PERFORMANCE

VALDUNES INDUSTRIES products are used in over 70 countries around the world, in every continent and in every possible kind of application, to all international standards and all conditions ; from extreme cold to extreme heat, under extreme loads, at very high speeds, **VALDUNES INDUSTRIES products are world renowned for their outstanding performance and for their contribution to the reduction of overall costs.**

THE PERFORMANCE OF VALDUNES INDUSTRIES PRODUCTS HAS BEEN PROVEN INTERNATIONALLY

- High speed **world records** (574.8 km/h) ;
- High speed wheel **life record** over 3.5 million km ;
- Heavy haul axle load over 40 tonnes ;
- Heavy haul wheel life up to 2 million km ;
- Urbans transport squealing noise reduction over 10-15 dB(A) ;
- Freight train noise reduction ;
- Heavy haul wheel life **2.5 times higher than other manufacturers** ;
- Wheel wear up to 30% lower than other manufacturers.





CORPORATE VALUES : PERFORMANCE & INNOVATION

VALDUNES INDUSTRIES is focused on our customer's needs to provide outstanding performance and innovation. By understanding and anticipating our customers' needs and adapting our offer according to their requirements **we are able to provide them with significant overall cost savings, peace of mind, safety and low risk.**

Our Research & Development and Engineering expertise provide innovative solutions ensuring that customers can rely on consistently outstanding performance from **VALDUNES INDUSTRIES'** products. **The values of performance and innovation are deep rooted in the culture of VALDUNES INDUSTRIES,** and this is reflected in the service that we provide. Equally **VALDUNES INDUSTRIES** is committed to the development and welfare of our salaries. The continuous improvement of our highly professional, dedicated team through training and career development is the foundation of our world class quality and performance. Each year we boost our workforce with the recruitment of new apprentices and graduates.

WHEELS

WHEELS

Wheels for every kind of rolling stock application, designed and manufactured **to give the optimum performance and lowest cost** in consideration of the operational requirements of our customers.

VALDUNES INDUSTRIES supplies wheels in all shapes, size from 400 mm diameter to 1350 mm diameter, and from 145 kg up to 1.2 tonnes and grades (EN grades : ER6, ER7, ER8, ER8S & ER9 and ER8C, AAR steel grades : Class L, A, B, C & D and alloyed steels).

VALDUNES INDUSTRIES wheels are **generally recognised for their high performance, long life and above average resistance to wear, defects, ovalisation, flats...**

VALDUNES INDUSTRIES supplies finished wheels and can also supply "black wheels" (forged, heat-treated and tested blanks) for local finishing and, of course, wheels assembled with axles into wheelsets.

PASSENGER CARS

Rail passengers around the world **can travel in comfort and safety thanks to VALDUNES INDUSTRIES** wheels for passenger cars. Rail operators benefit from the peace of mind and reduced operating costs assured by VALDUNES INDUSTRIES wheels' quality, performance, safety and long life.

HIGH SPEED AND VERY HIGH SPEED

VALDUNES INDUSTRIES is **the only manufacturer to have supplied high speed wheels VHiS® to every continent.** We are also the proud supplier of the wheelsets for **9 world speed record breaking trains over the last 40 years** notably in 2007 (574.8 km/h) and also in 1990 (515.3 km/h) and 1981 (380 km/h). As can be seen VALDUNES INDUSTRIES has been a specialist in the supply of wheels for high speed and very high speed trains for over 35 years **and has unrivalled experience.**

EMU/DMUs

Wheels for EMUs and DMUs with holes for wheel mounted brake discs, option for additional noise damping solutions.

METRO / TRANSIT

VALDUNES INDUSTRIES wheels and auxiliary safety wheels **are used by many of the leading metros around the world** and are recognised for their high performance and long life.



WHEELS

RESILIENT WHEELS FOR LIGHT RAIL VEHICLES

VALDUNES INDUSTRIES VUT® wheel is the original high resilient wheel design that allows Light Rail Cars manufacturers **to make huge savings on the suspension system, whilst improving passenger comfort and reducing noise and vibration.**

The VUT NEO® is the next generation of high resilient wheel design from VALDUNES INDUSTRIES.

The VLR-1060 wheel is a resilient wheel with medium radial resilience and low axial resilience, offering outstanding performance, and low maintenance costs.

VALDUNES INDUSTRIES can also offer a range of more traditional resilient wheels. Resilient wheels can be supplied a full complete assemblies or in kits for rolling stock maintenance.

LOCOMOTIVES

VALDUNES INDUSTRIES supplies wheels for every type of locomotive from shunters to high powered locomotives. The wheels can be provided in any kind of steel grade.



HEAVY HAUL

High performance wheels designed to withstand very high axle loads (up to 50 tonnes) giving high performance and long life. Usually manufactured using VALDUNES INDUSTRIES **micro-alloyed steel grades.**

VALDUNES INDUSTRIES is a world leader in the design, manufacture and supply of these high performance, specialised products.

VALDUNES INDUSTRIES VHD® wheels have been proven to give an extended life, of up to 2 million km and to significantly reduce maintenance costs.

FREIGHT CARS

A full range of wheels for freight cars, including low stress wheels and **solutions to optimise the wheel's resistance to tread braking.**

SPECIAL VEHICLES

Wheels for a range of special vehicles, track maintenance machines (ballast cleaner and regulator, track renewal trains), cranes, trolleys, torpedo ladle cars for steel works.



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VALDUNES INDUSTRIES

**manufactures axles for all
rolling stock applications
and sectors**”

AXLES

Axles supplied by VALDUNES INDUSTRIES are also used in all rolling stock applications and sectors ; for trailer cars, with or without seats for brake discs, for motor cars and locomotives with seats for mounting gears, gearboxes or reduction units, with different gauges, with seats for internal mounted bearings. Axles can be provided as rough machined or finished machined. The axles are manufactured from either forged rolled bar or from forged axle blanks **in accordance with international standards and all steel grades specifications** (EN-EA1N, EA1T & EA4T and alloyed steel grades 42CrMo4, 30NiCrMo8, 30NiCrMoV12).

- Hollow axles from Ø30 up to Ø110 mm reducing weight and enabling easy in service ultra-sonic inspection ;
- High speed axles with protection against impact ;
- Cold rolled axles ;
- Protection against corrosion (Painting, Temporary coating, VCI Vapor Corrosion Inhibitor bags).

WHEELSETS

VALDUNES INDUSTRIES assembles wheelsets for all kinds of rolling stock.

Wheelset assembly can include the mounting of gear wheels, gearboxes, reduction units, brake discs on either the axle or the wheels, bearings and axleboxes.

The components mounted can be supplied as part of VALDUNES INDUSTRIES scope or free-issued by our customers for mounting.

- High Speed Trains
- Very High Speed Trains
- EMU/DMUs
- Metros
- Freight Cars
- Heavy Haul Ore Cars
- Locomotives



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Solution for complete assembled wheelsets including gearboxes

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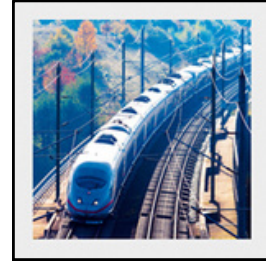


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**VALDUNES INDUSTRIES’
expertise can help you to
improve your wheelsets
performance**

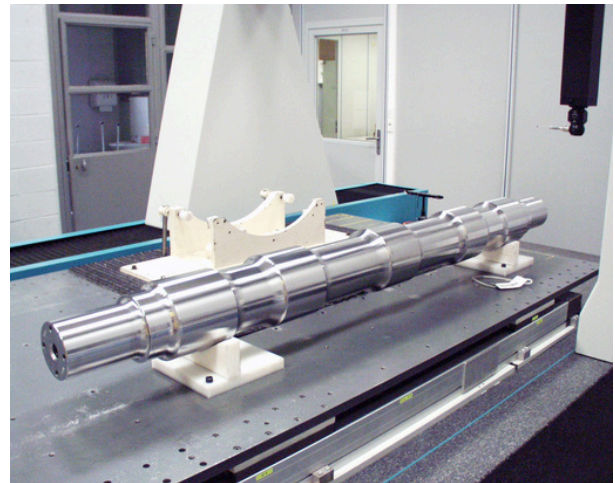
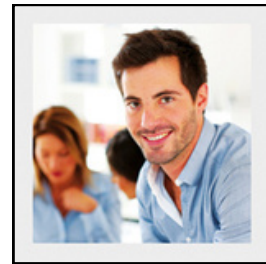
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In addition to the provision of high quality products and maintenance services VALDUNES INDUSTRIES knowledge and experience mean that **we can offer expertise and advice expertise on operational problems with wheels, axles or wheelsets.**



These consultancy services include :

- The provision of solutions to improve performance ;
- Improve defect resistance ;
- Reduce noise ;
- Reduce wear ;
- Reduce weight ;
- Increase life ;
- Metallurgical analysis and expertise with a complete new Test Centre including material testing and chemicals analysis ;
- Steel expertise and Steelshop qualification process ;
- Wheel, axle and wheelset design, validation and testing ;
- Technical support for certification and qualification process ;
- Definition of specifications and standards ;
- NDT expertise.



FORGED MECHANICAL COMPONENTS (CMF)

VALDUNES INDUSTRIES Forged

Mechanical Components :

- Crane wheels ;
- Rollers ;
- Pulleys ;
- Gear blanks ;
- Brake discs.

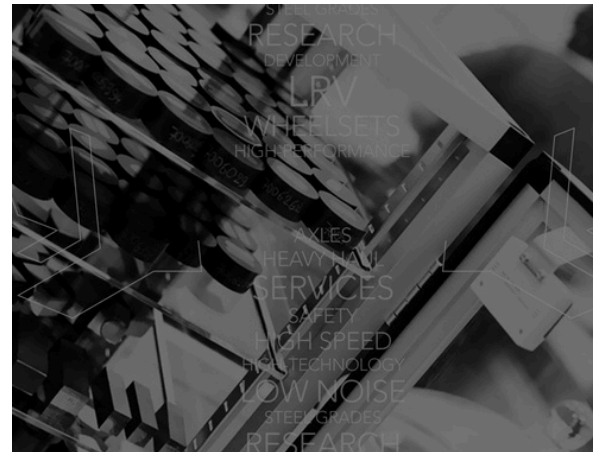
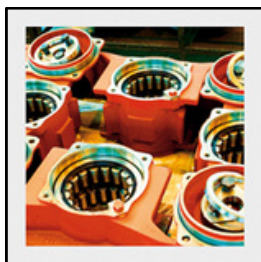
VALDUNES INDUSTRIES metallurgical expertise and experience has resulted in unique steel grades and manufacturing processes that mean that **our CMF products are world renowned for their exceptional performance.**

Applications :

- Overhead cranes ;
- Gantry and port cranes ;
- Rotary furnaces ;
- Funicular ;
- Locks and ship lifts ;
- Shipping and railway transmissions and reducers ;
- Piston heads for diesel engines.

Safety, reliability, durability

Our customers can safely rely on VALDUNES INDUSTRIES crane wheels to carry hundreds of tonnes of liquid steel without breaking down or needing to be often replaced.



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CMF products are
**world renowned for
their exceptional
performance**
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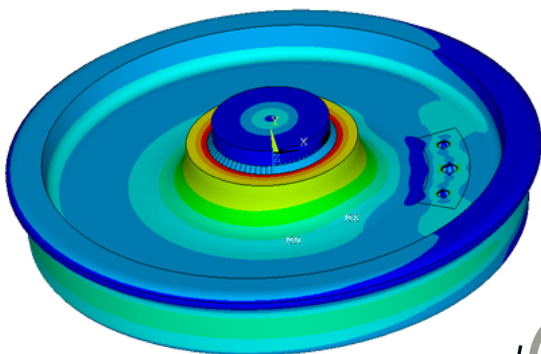
R&D / ENGINEERING

Based on its experience and network, **VALDUNES INDUSTRIES** has established a research laboratory call **SWITlab** (Science for Wheelset Innovative Technology) in collaboration with universities in northern France (Université des Hauts-de-France), LaMcube and LAMIH.

The laboratory is dedicated to the search for the optimization of manufacturing processes and the dimensioning of rolling components including the real material properties. Numerical models associated with the characterization of steels make it possible to optimize the design before full-scale test phases. The project is supported by the Haut-de-France region, which welcomes French Railway cluster, I-Trans.

This task force is focus on our customers operations so that we can develop solutions which are appropriate to the market and which will bring genuine benefits in terms of :

- Operational performance ;
- Overall cost reduction - Production, LCC and maintenance ;
- Improved safety ;
- Sustainable development.



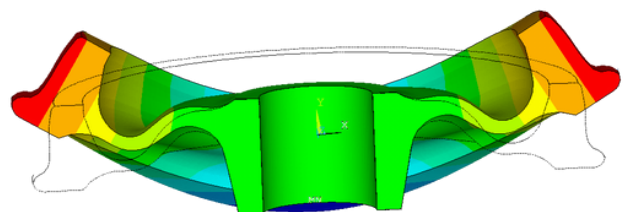
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Develops solutions
which bring genuine
benefits”

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The results of the **VALDUNES INDUSTRIES'** R&D are illustrated by the realization of the following projects :

- VMS® low stress wheel, high resistance wheel to drag braking ;
- VALD25, VALD22 and VALD20 optimized freight wheelsets capable of replacing the majority of European freight axles on the market for 25T, 22.5T and 20T per axle with an increased margin of safety ;
- VUT®, VUT NEO® and VLR1060® resilient wheels dedicated to urban transport safety and comfort - low noise - low vibrations ;
- VHD® Micro Alloyed Steel dedicated to LCC improvement in severe conditions of loading and weather conditions ;
- VLN® VALDUNES INDUSTRIES Low Noise associated to sustainable development ;
- VHiS®, Very High Speed wheels for high performance at high speed.



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A holistic approach to
product design optimization

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DESIGN MODELING

VALDUNES INDUSTRIES engineering team has unrivalled expertise in the design of wheels, axles and wheelsets. The team uses state of the art design support tools and techniques to model product behaviour **in order to optimize the performance and safety of our designs** :

Finite Element Modeling, wheel/rail interface modeling, fatigue analysis using mono & multiaxial criteria, 3D modeling, thermal behavior modeling, press fitting and contact modeling, noise calculation using STARDAMP software (Deufrako project)...

These tools enable product designs to be validated to ensure their safe, reliable and enduring operational performance.

METALLURGY

With its heritage in steel making, **VALDUNES INDUSTRIES** has superior expertise in wheel and axle metallurgy.

Our metallurgical innovations, such as the VHD micro-alloyed steel grades for heavy haul applications, have been proven, in service, to give **VALDUNES INDUSTRIES** products exceptional performance with reduced wear, increased resistance to defects, reduced maintenance costs, longer life, increased safety and subsequent significant reductions in overall life cost.

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Innovator of micro-alloyed and ultra clean steel technologies for rolling stock wheelsets

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DESIGN VALIDATION & TESTING

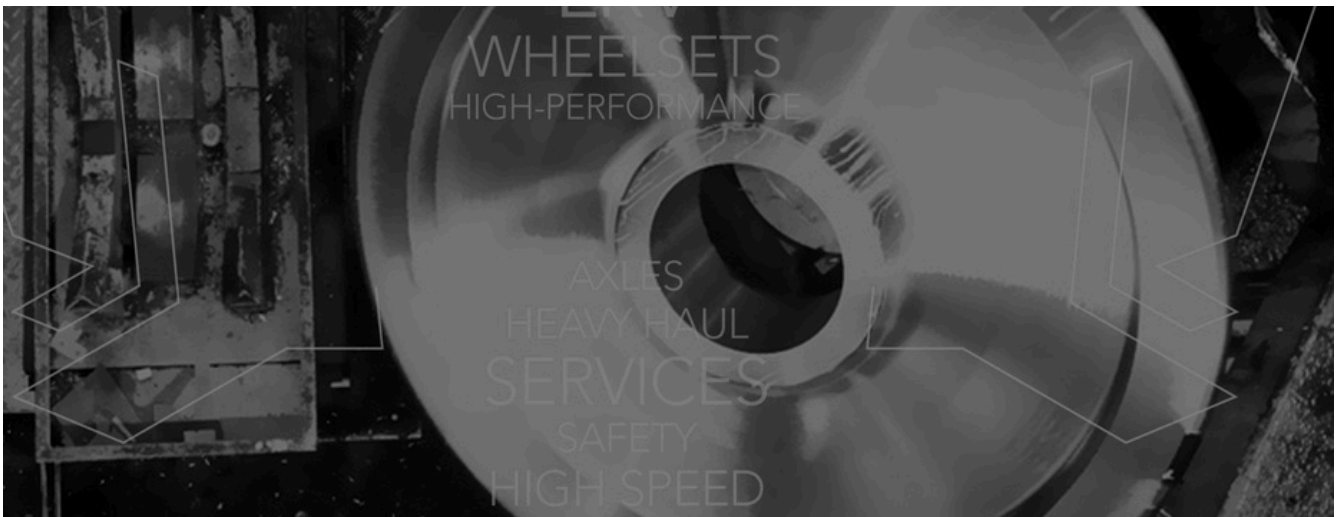
In addition to the modeling of designs and metallurgy, products are validated and proven by physical testing which is done in **VALDUNES INDUSTRIES** internal **testing** facilities such as the MTC and our acoustic testing laboratory or by the independent test centres SWITlab and various partners such as the Eurailtest facility in Paris and the DB testing and research facilities in Minden, Germany.

Our products and our metallurgy are subject to continuous review and improvement. We encourage feedback about the operational performance of our products' from all our customers and establish close relationships with them to conduct field studies to measure and compare performance.

These studies provide the evidence of our products' improved performance and the data needed for further improvement.



“
VALDUNES INDUSTRIES,
holds a R&D centre into
wheels, axles and
wheelsets
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MANUFACTURING PROCESS

PROCESS

Vigorous control of the entire manufacturing process is **essential to maintain VALDUNES INDUSTRIES high standards of quality and performance in forging, heat-treatment and protection against corrosion and impacts.**

STEEL

The steel used by VALDUNES INDUSTRIES is **sourced from carefully selected and approved suppliers** and is manufactured to VALDUNES INDUSTRIES specifications written and controlled by VALDUNES INDUSTRIES expert metallurgists **to ensure that the end products give the required performance.**

In using a panel of different sources we are able to ensure the security of supply of steel, to use the most appropriate source to give us the exact steel that we require. VALDUNES INDUSTRIES benefits from the economies of scale in manufacture, ongoing investment in state of the art steel making that our suppliers are able to generate.

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The steel is **sourced from carefully selected and approved suppliers**

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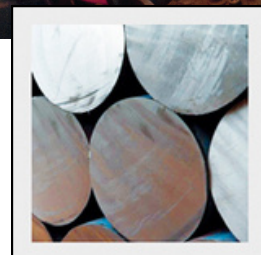


FORGE

VALDUNES INDUSTRIES fully automated wheel forging line at Dunkirk has long been the bench mark for wheel forging technology and produces forged blanks with first rate dimensional accuracy with minimal material usage. The facility comprises a 6000T press for upsetting and forming the shape of the wheel, a fully automated, computer controlled rolling mill, a 5000T dishing press and a controlled cooling line.

The agreed investment in the plant will improve productivity and ensure continued excellence in accuracy and steel consumption.

The forge is capable of producing pieces from 140kg up to 3 tonnes, and from 600mm diameter to 1360mm diameter.



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Consistently **excellent**
mechanical characteristics

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HEAT TREATMENT

The Heat Treatment line at Valenciennes is also fully automated, with computer controls to manage furnace temperatures, quenching duration, water temperature and pressure. The facility uses work instructions written by VALDUNES INDUSTRIES expert metallurgists **to ensure that VALDUNES INDUSTRIES wheels have been consistently excellent mechanical characteristics deep into the wheel rim.** After heat treatment all wheels undergo an automatic rim hardness test.

METALLURGICAL TEST CENTRE

VALDUNES INDUSTRIES' Metallurgical Test Centre (MTC), opened in 2012 after an investment of over 1m EUR, **performs the required routine metallurgical and mechanical testing on wheels as well as expert technical services and tests for R&D purposes.**

The work of the MTC enables VALDUNES INDUSTRIES to ensure the consistently outstanding quality of its products, to continuously improve and refine steel grade specifications and heat treatment parameters and to support the R&D team **in producing innovative solutions for the operational performance issues of our customers.**

MANUFACTURING PROCESS

MACHINING

VALDUNES INDUSTRIES wheels and axles are precision finished using CNC machines, giving an excellent surface finish and dimensional accuracy. Significant investment will ensure that the machining capacity is much increased. The new, fully automated, machining lines are organised according to the Lean Manufacturing concept, and **will improve productivity, reduce throughput time and delivery lead times.**

INSPECTION, QUALITY CONTROL

After machining wheels and axles are thoroughly inspected. **Automated ultrasonic and magnetic particle NDT lines control for internal and external defects,** dimensions are validated using precision instruments and the external aspects of the products are scrutinized.

WHEELSET ASSEMBLY

We have two press fitting lines to assemble wheelsets, including the mounting of brake discs, bearings, axleboxes, gears, gearboxes and reduction units according to our customers' wishes. Wheelsets are fully inspected after assembly including dynamic balancing. The components mounted can be supplied as part of VALDUNES INDUSTRIES scope or free-issued by our customers for mounting.

PROTECTION & PACKAGING

All of VALDUNES INDUSTRIES wheels, axles and wheelsets are appropriately painted or protected against corrosion according to our customers' wishes before being packed and shipped. VALDUNES INDUSTRIES is using the experience of main railways and academic experts for the improvement of coating conditions.

VALDUNES INDUSTRIES was a member of the Euraxles (European funded research programme) working group for the improvement of axle protection against corrosion.

Shipments can be arranged by our dedicated logistics team to any location around the world according to the agreed Incoterms (FOB, DAP, CPT, CIF, DDP etc.)

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Modern facilities for complex machining operations : turning, milling, boring, drilling, grinding and cold rolling

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QUALITY & SAFETY

The essence of VALDUNES INDUSTRIES ongoing success is quality. At VALDUNES INDUSTRIES, we are dedicated to ensuring the continued excellence of our products, our processes and our services.

VALDUNES INDUSTRIES products are used in extreme operations : at over 320 km/h, with axle loads of over 40 tonnes, with intense braking conditions, in arctic or desert environments.

In all cases the products that VALDUNES INDUSTRIES supplies are critical to the safe running of the rolling stock to carry its load or its passengers to their destination.

Our ongoing commitment to the highest quality standards permits our customers, the users of our products, and their customers and passengers complete peace of mind.

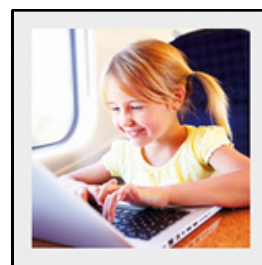
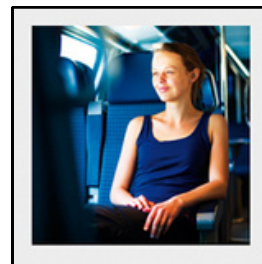
VALDUNES INDUSTRIES Quality Management System is certified according to the usual international quality standards : ISO9001, IRIS, RISAS...

In addition VALDUNES INDUSTRIES has approval from major customers, rail operators and car builders around the world, including : AAR, SNCF, DB Q1, RATP, OBB, SBB, SNCB, IRB, Alstom Transportation, Hyundai Rotem, Bombardier Transportation...

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Our outgoing commitment to the highest quality standards permits our customers, the users of our products and their clients and passengers complete peace of mind

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ENVIRONMENT

It is well known that rail travel is amongst the most environmentally means of transport. VALDUNES INDUSTRIES is glad to be at the heart of this environmentally friendly industry and to make our contribution to reducing the impact of modern society on the environment. **VALDUNES INDUSTRIES has the ISO14001 certification.**

The majority of the raw materials we use are manufactured from recycled materials. The outstanding performance and extended life of VALDUNES INDUSTRIES' products assure that the use of resources is optimised. **At the end of their life our products can be 99% recycled.**

We are dedicated also to contributing to the creation of a better environment through our development solutions to reduce noise and vibration using resilient wheels and noise damping device. In our industrial processes **we have a continuous improvement plan to reduce emissions and to reduce consumption of resources.**

AFTERSALES SERVICE

Our Quality Department Aftersales Service **provides solutions to our customers to resolve any problems they might encounter.**

Our Aftersales Services' aim is to provide :

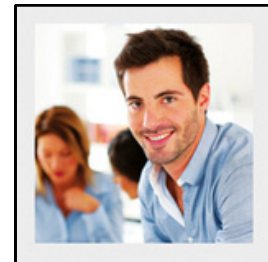
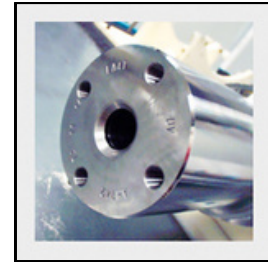
- Fast, reliable and competent customer support ;
- Assistance with Ongoing training qualification of operators and maintainers ;
- Diagnosis and troubleshooting of customers operational problems associated with wheels, axles and wheelsets ;
- Prompt and effective spare or replacements parts supply.

Our close support of customers in the field enables us to feed back their experiences to our R&D team, enabling us to maintain our core corporate values of outstanding performance and innovation.

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Aftersales service : **fast;
reliable and competent**

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CERTIFICATIONS & REFERENCES

CERTIFICATIONS

VALDUNES INDUSTRIES Quality Management System is **certified according to the usual international quality standards :**

- ISO9001
- IRIS
- RISAS
- ...

In addition VALDUNES INDUSTRIES **has approval from major customers, rail operators and car builders around the world**, including :

- SNCF
- DB Q1
- AAR
- RATP
- OBB
- SBB
- SNCB
- IRB
- Alstom Transport
- Bombardier Transportation
- Hyundai Rotem...

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- DB
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- Bombardier Transportation
- BHP
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- Transnet
- Progress Rail
- Renfe
- Transdev
- Veolia
- Korail
- Hyundai Rotem
- GHH Radsatz
- ONCF
- SNTF
- TCDD
- STC
- VIA RAIL
- CRRC CORPORATION



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VALDUNES INDUSTRIES is
focussed on our customers
needs to provide outstanding
performance and innovation

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