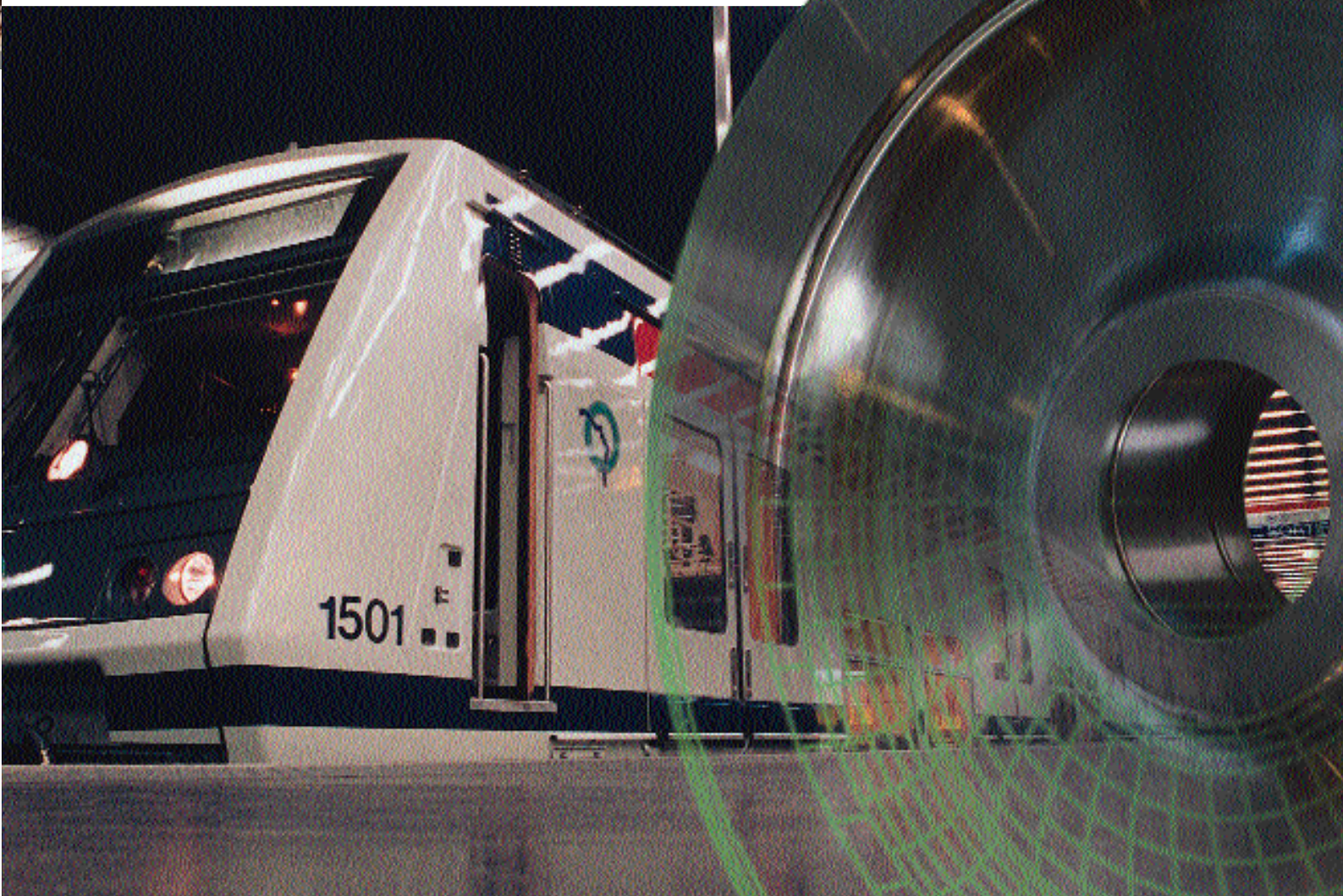


URBAN TRANSPORT

innovative solutions



Urban transport

As the European leader in railway running gear, Valdunes customises each of its solutions to its customers requirements for safety, speed, economy, comfort and environmental protection. Its high quality and service, and ability to innovate have made the company a world renowned force in the fields of both passenger and freight transport.

THE HELSINKI METRO IS EQUIPPED WITH VALDUNES' WHEELS FITTED WITH NOISE-DAMPING RINGS.



IN HONG KONG, VALDUNES' TECHNICIANS CARRIED OUT NOISE MEASUREMENTS UNDER ACTUAL OPERATING CONDITIONS.

specialist as well as standard products with the same attention to detail and careful observation of international specifications.

VALDUNES: CORPORATE STRENGTH

Today, one of Valdunes' major assets is indubitably its membership of a global group. This privileged position affords:

- mastery of raw material quality through the selection of recognised suppliers including Ascometal, the leader in special steels,
- technical mastery through the pooling of expertise throughout the Group's highly skilled workforce
- mastery of technological innovation, optimised by the synergy created within the Group,
- economic skill based upon adaptability and responsiveness to customer requirements.

VALDUNES: THE APPROPRIATE SOLUTION

At Valdunes, flexibility and adaptability are the key words for effecting progress. Flexibility in the ability to manufacture small batches or large quantities. Adaptability in the knowledge that Valdunes' products fulfil their customers' requirements for



VALDUNES HAS CARRIED OUT MANY STUDIES TO REDUCE FLANGE SQUEAL AND OFFERS SOLUTIONS TAILORED TO URBAN TRANSPORT.

ort

The areas of technological progress in the field of railway wheels and axles relate principally to improved performance and operational profitability. In the urban and metropolitan transport sector (suburban trains, metros, light rail vehicles, tramcars), noise-damping and protection of wheels, comfort, weight-reduction of rolling-stock, wear-resistance and performance under braking are fields that are at an advanced stage of research and implementation at Valdunes.

From standard products to customised solutions

COMBATING NOISE POLLUTION

The major source of noise is generally from wheel-rail contact and this is the most difficult to combat. Valdunes offers an effective solution to reduce flange squeal typical of urban lines, metros and tram systems with tight curves, achieving a reduction of 15 dB tested on both monobloc

and tired wheels. The noise-damping technique recommended by Valdunes consists of dissipating acoustic energy by friction between a stainless steel ring and the wheel. The position of the ring relative to the rim is optimised by finite element analysis. This type of noise-damped wheel is in service on many metro systems, including those in Paris, Lyon, Helsinki, New York, Hong Kong, etc., as well as on some

locomotives on European networks.

Other avenues for improvement currently being explored to reduce straightline running noise include damping of vibrations by varying the mass and the shape of the wheel or the fitting of absorbent screens on the wheel. In this context, Valdunes' Technical Department coordinates its work with Sogérial and is also active in international study groups reducing running noise.

ADAPTING TO THE DIVERSITY OF URBAN TRANSPORT ROLLING-STOCK

Valdunes can offer for all types of power and trailer vehicles : metros, tram systems and passenger vehicles. Mastery of the metallurgy and our design facilities enable us to propose customised dimensions for wheels, axles and wheelsets.

Axles can be designed with cylindrical or conical seats.

In order to reduce train set weight and increase capacity, Valdunes can offer hollow axles or independent wheels with integrated bearings. This technique frees the space normally occupied by the axle, improving access and passenger movement within the train .



THE LILLE TRAM SYSTEM TRAILER WHEELSETS WERE SUPPLIED BY VALDUNES.



Design

Research and development play a vital role at Valdunes. Within the Technical Department, specialist teams work closely with experts in metallurgy, mechanical engineering, acoustics and vibration analysis from research laboratories such as IRSID (Steel Industry Research Institute); CREAS (Special Steels Research Centre), or from universities. The synergy of their expertise accelerates and consolidates the technological progress achieved.



Wheel with noise-damping ring.



Safety wheel for pneumatic-tyred metros: it performs a braking and support function in the event of a flat tyre.



Standard wheel for urban traffic (with noise damping system)

THE CARACAS METRO IS COMMITTED TO VALDUNES



OPTIMISING PASSENGER COMFORT AND SAFETY

Valdunes produces safety wheels for pneumatic-tyred metros, such as in Paris. As an integral part of the wheel hub, the primary function of these wheels is braking and support in the event of a flat tyre. In conjunction with RATP, Alstom and the University of Valenciennes, Valdunes is now using the same principle to develop a similar wheel with reduced flange squeal capable of absorbing greater braking pressure.

Mindful of passengers' requirements, and the need for ease of access for those with limited mobility, Valdunes adapts its wheels and axles to the low-floor vehicles increasingly adopted by operators. This solution, which consists of using small-diameter wheels, also allows faster boarding and setting down at stations: an advantage not to be underestimated as it ensures a more efficient service.

VALDUNES ENSURES OPTIMUM PROTECTION OF ITS PRODUCTS

As part of Valdunes' commitment to quality, each wheel coating is selected according to the requirement likely to be encountered in service. Temporary coatings (varnishes and greases) are taken into consideration at the component design stage, and ensure perfect protection up to delivery and final assembly. Other coatings, such as paints or resins, guarantee maximum ongoing protection against mechanical impacts and extreme weather conditions.

On the same principle, the packing of components produced and supplied by Valdunes is designed to suit the individual user's transport and assembly arrangements. According to customer requirements, Valdunes supplies its components loose, on pallets, in crates, or in reusable racks. This customised approach is complemented by refined logistics, lead times optimised by means of a synchronous flow management system, and particularly efficient after-sales service.



VALDUNES HAS A SOUND-PROOF CHAMBER WHERE ITS SOLUTIONS FOR NOISE DAMPING CAN BE TESTED



Head office
11/13 Cours Valmy
Immeuble Pacific
TSA 40004
92070 Paris La Défense Cedex France

Telephone: 33 (0)1 41 25 91 17
Fax: 33 (0)1 41 25 96 04