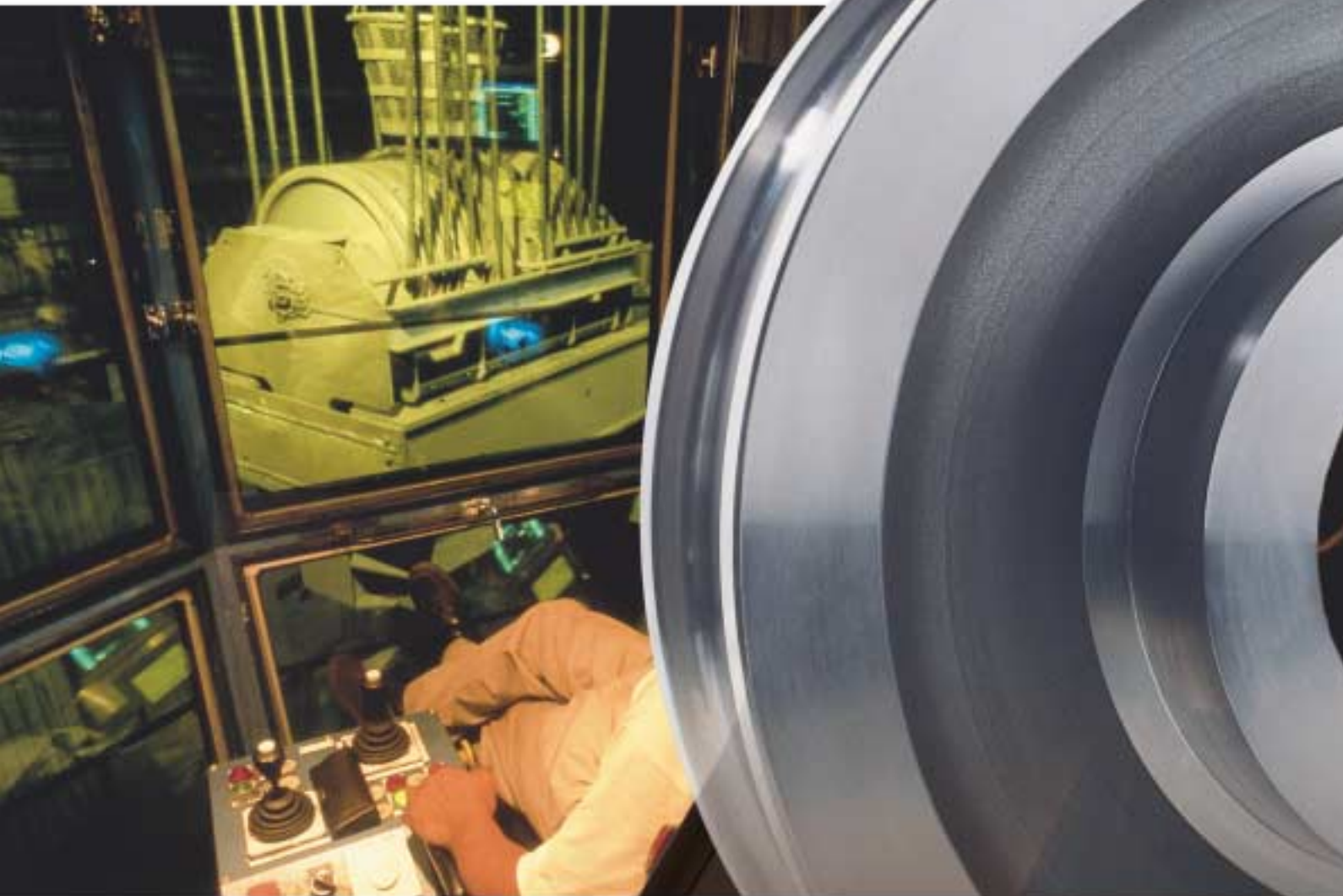


FORGED MECHANICAL COMPONENTS

Innovative solutions





Valdunes Composants Méca



▲ A MASTER OF ITS CRAFT.

Valdunes, the european leader in railway running gear is extending its expertise to the field of forged mechanical components for industrial applications. Valdunes is renowned the world over for its high quality and innovative abilities but these characteristics alone, even combined with surpassing expertise in its field, are not enough to satisfy a demanding customer base; first and foremost, a Valdunes component is designed to meet its user's very specific requirements.

* Composants Mécaniques Forgés = C.M.F. : Forged Mechanical Components

VALDUNES: IN-DEPTH CAPABILITY

From initial design to delivery and after-sales services, Valdunes controls every stage to meet each customer's specific requirements.

- Control of the quality of its raw materials by selecting well-known suppliers, including Ascometal, the leading producer of special steels,

- Control of costs through the ability to adapt, react and invest according to customers' requirements that only a European group can provide,

- Control of material supply, thanks to the proximity of Ascometal, situated on the same site as Valdunes, near Dunkirk,

- Control of the necessary technical skills, thanks to a sharing of experience and a highly qualified workforce.



◀ VALDUNES C.M.F. HAS EXTENSIVE RESOURCES.

VALDUNES C.M.F

From the very start, with the initial expression of requirements, the dialogue between Valdunes C.M.F. and its customers ensures the optimum technical, cost-effective solution.

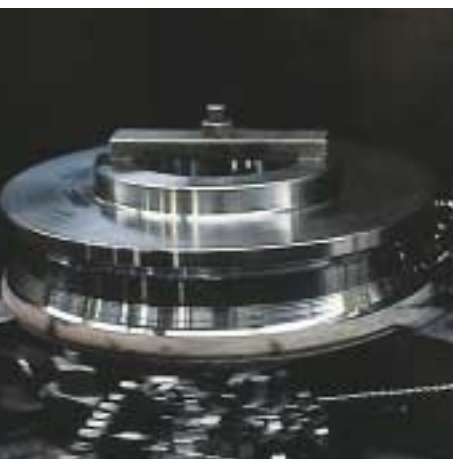
By assisting in the specification of the forged component, recommending the appropriate grade of steel for the particular use and offering complete machining or assembly of ancillary equipment, Valdunes provides end users with a reliable product, perfectly suited to their operating conditions.

niques Forgés*

EFFICIENT PRODUCTION PLANT

Whether produced by its state of the art production plant in large volumes, small lots or as one-offs,

The products of Valdunes C.M.F. are renowned for their reliability and durability. These two essential characteristics significantly reduce the risk of production down time and speed up maintenance operations - major advantages in sectors where productivity and safety requirements are increasingly in demand.



The various stages in the production of a crane wheel

- Heating of blanks
- Press forging of blanks
- Forging/die-forging
- Rough-machining
- Heat treatment, spray quenching of the running surface or structural hardening
- Final machining
- Final inspection
- Fitting out: shafts, transmissions, bearings

A well-designed production unit

- Heating and holding furnaces
 - 6000-tonne press
 - 1500-tonne press
- Heat treatment plant
- Machine-shop with a full range of machine tools
- Engineering and assembly shop equipped with facilities for hot- and cold-shrinking
 - Non-destructive testing (ultrasonic and MPI) and other testing equipment

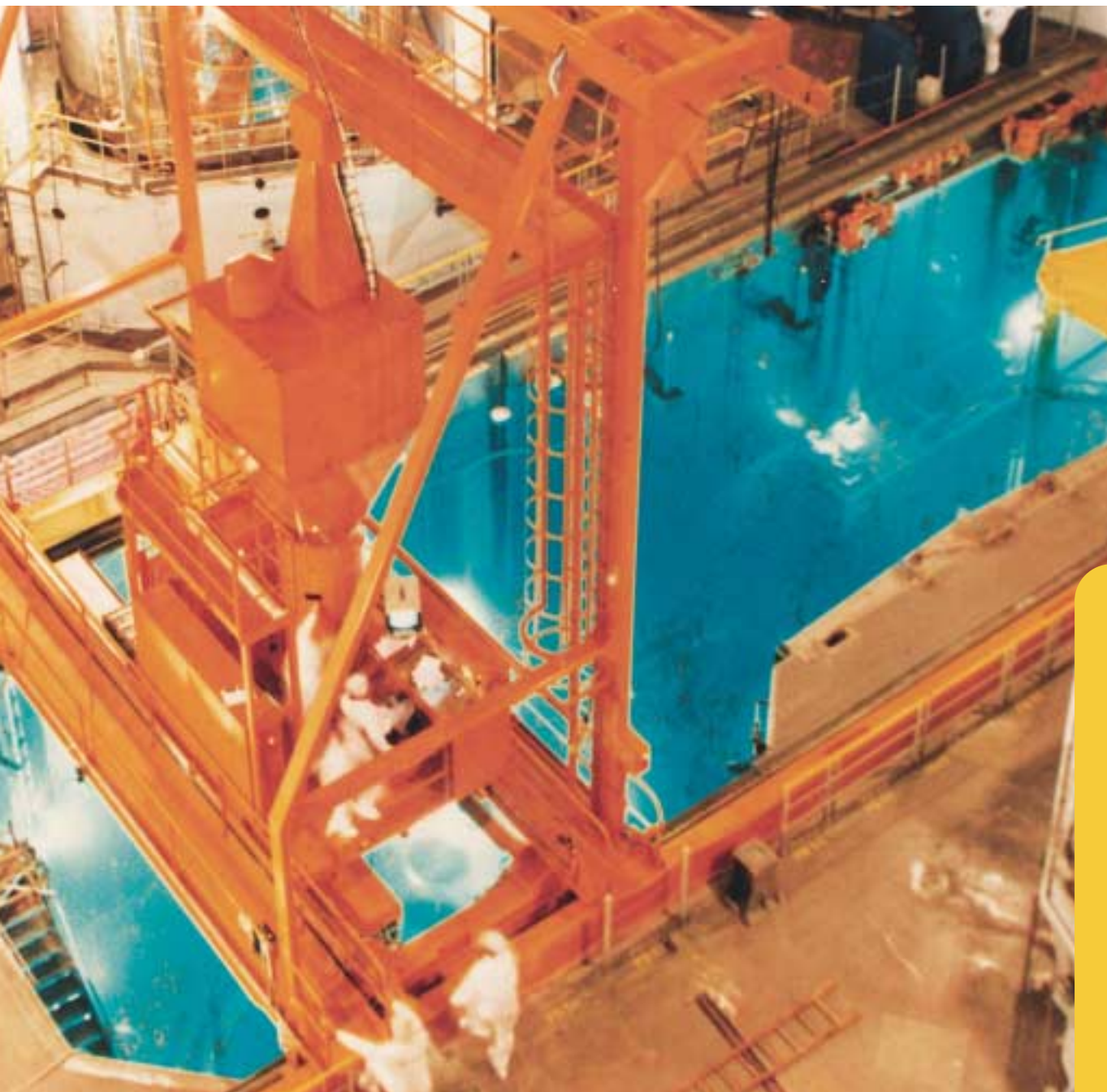


▲ FACILITIES FOR RESEARCH AND PRODUCTION OPTIMISATION.

▼ VALDUNES C.M.F. SUPPLIES THE NUCLEAR INDUSTRY UNDER STRICT QUALITY ASSURANCE.

Whether a crane wheel, pulley, gear blank, forged shaft, piston head, TGV brake disc or drive gear blank, every mechanical component forged by Valdunes is specially suited to its specific industrial function.

Performance combined



Steel grades

34/42 Cr Mo 4
42 Cr Mo 5-04
30 Cr Ni Mo 8
C 40
28 Cr Mo V 5
16 Ni Cr Mo 13
18 Cr Ni 8
16/20 Ni Cr 6
15/16 Cr Ni 6
18 Ni Cr Mo 6
17 Cr Ni Mo 6
38 Cr 4
50 Cr V 4

THE APPROPRIATE SOLUTION

Although designed primarily for consumers in the steelmaking, mining, cement, petrochemical, nuclear and port sectors, Valdunes C.M.F. also numbers many assemblers and OEMs among its customers.



◀ WHEN THE APPLICATION DEMANDS IT, VALDUNES C.M.F. USES ULTRA-CLEAN STEELS.



Piston head for a large diesel engine.



Forged gear blank



Crane wheel with shaft and bearings



High-performance brake disc for high speed trains



Overhead crane wheel with shaft

with flexibility

USE OF ULTRA-CLEAN SPECIAL STEELS

When the application demands it, Valdunes produces its forged mechanical components from special steels, manufactured to the highest levels of cleanliness and vacuum degassing.

These steels are processed from vertical rotary continuous cast feedstock or from bottom-poured ingots.

PRECISION FORGING

Expensive rough machining can be eliminated, thanks to the high level of dimensional accuracy, concentricity and precision of the forged blanks.

HEAT TREATMENT

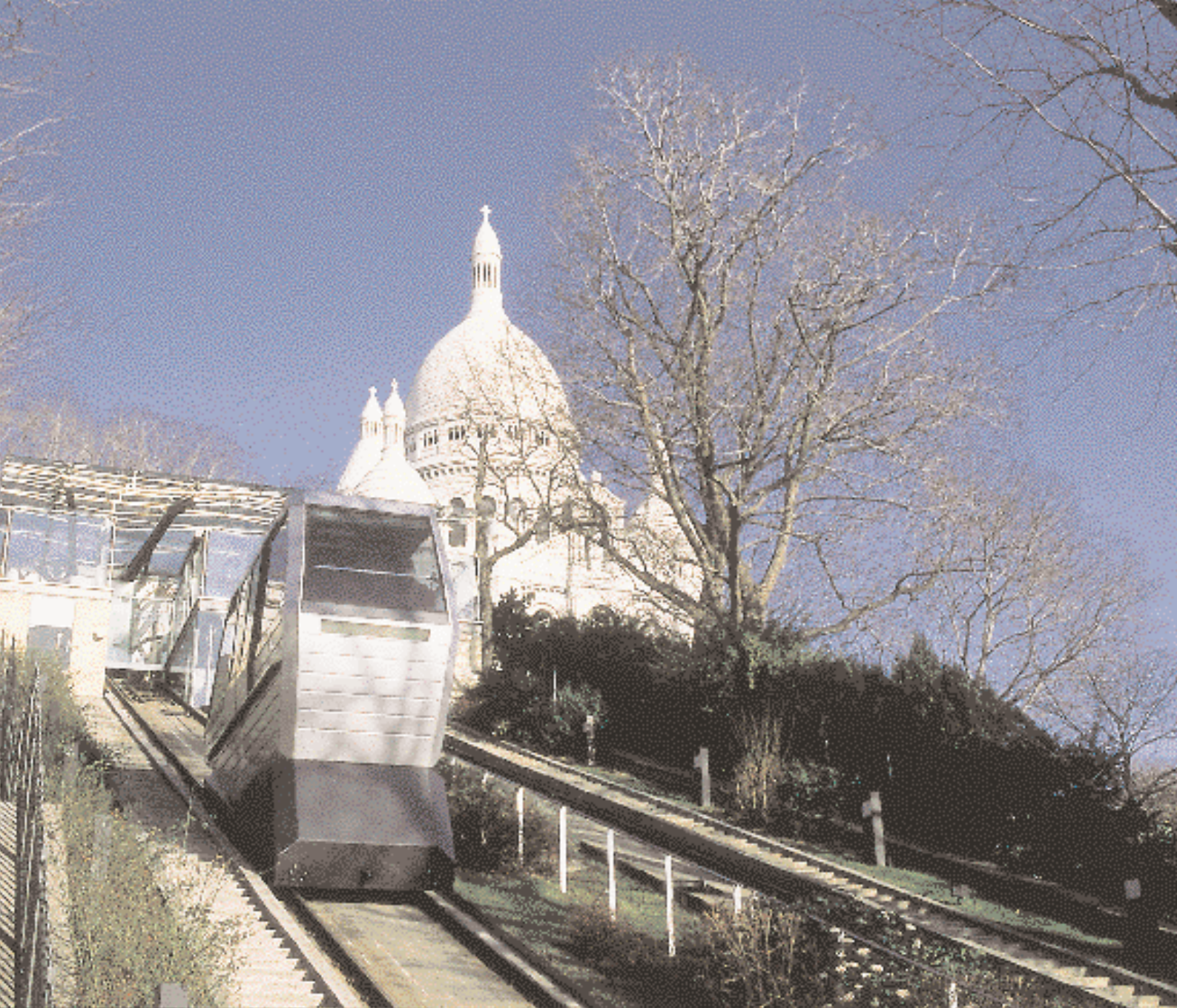
With its high-performance furnaces, Valdunes can carry out all types of quenching, tempering and stress-reducing treatments, including complex cycle sub-contract heat treatments for special steels.

Valdunes recommends GP grade steels for wheels subject to heavy loads and demanding operating conditions.

Hardness HB	Heat treatment	Tensile strength Rm (MPa)	Yield strength Re (MPa)	Elongation A (%)	Designation		
					Afnor	Valdunes	DIN
450/500	Rim-quenched	1500/1700	> 1200	7	42 CD 5-04	GP	42 Cr Mo 5-04
475/525	Rim-quenched	1500/1700	> 1200	7	50 C V 4	G 170	50 Cr V 4

Other grades of steel suitable for normal operating loads and conditions

Hardness HB	Heat treatment	Tensile strength Rm (MPa)	Yield strength Re (MPa)	Elongation A (%)	Designation		
					Afnor	Valdunes	DIN
321/363	Rim-quenched	1050/1200	> 700	10	XC 75	Class C	C 75
310/350	Immersion-quenched	1000/1150	> 830	10	42 CD 5-04	G 120	42 Cr Mo 5-04
280/310	Immersion-quenched	880/1020	> 730	12	42 CD 4	G 105	42 Cr Mo 4
230/260	Normalised	800/900	> 420	14	XC 70	G 90	C 70



From standard component to cu



▲ VALDUNES C.M.F.
COLLABORATES CLOSELY
WITH OEMs.

Valdunes C.M.F. is capable of adapting to the most diverse requirements. For example, in terms of unfinished components, Valdunes produces all forms of precision forged and safety rollers and gear blanks for incorporation into power transmission units: transmission gearboxes for power units, drive gears for diesel engines, idler and drive rollers, reduction gears, etc.

Valdunes also offers open-die forgings produced from tooling designed in-house. Unlike stamping, this technique is particularly economical for small quantities (batches of less than 100 components).

MULTI-DISCIPLINARY SERVICES TO THE READY TO INSTALL AND MAINTENANCE SECTORS

Valdunes C.M.F. is expanding into the machining and assembly of sub-assemblies requiring, for example, hot and cold shrinking operations, the mounting of bearings or maintenance services.

The end user not only benefits from the time saved but also from requiring only a single contact point, Valdunes, with its wide variety of experience.

VALDUNES: QUALITY CONTROL...

Just like all the components that Valdunes produces for the railway industry, all its forged mechanical components are also 100% inspected (dimensional properties, surface appearance and condition, ultrasonic examination of the internal structure, etc).

... AND GUARANTEED AFTER-SALES SERVICE

Following delivery, Valdunes C.M.F. provides its customers with technical support for its products during use. The experience of its personnel and its extensive testing, research and metallurgical and mechanical analysis facilities enables Valdunes to check actual operating conditions, identify any anomalies on site and make any appropriate recommendations.

Valdunes C.M.F. is designed to provide a rapid response and efficient service.

Principal references and approvals:

ISO 9002, ISO 14001. Alstom, Arcelor (Arbed, Acéralia, Usinor, Cockerill, Sidmar), Caillard, CMD, CORDM, Corus, Danieli, Dehousse, Dillinger, ECL, Eiffel, EDF, Groupe Fayat, Flender, ISRO, Ispat, Joseph Paris, Koch, Konecranes, Kranbau Köthen, Krupp, Ministère Wallon de l'Équipement et des Transports, Noell, Ports Autonomes de Dunkerque, du Havre, de Marseille, de Paris-Gennevilliers, Rémy Barrere, Saarstahl, Sab Wabco, Schalke, Thyssen Krupp Stahl, Voest Alpine, ZF Masson.

Valdunes also produces crane wheels according to different standards: DIN 15 078, DIN 15 079, DIN 15 090, SID 466, SIDMAR SV3-760.



Wide-hub runner.



Forged gear blank



Crane wheel and shaft fitted with a drive unit



Wheel centre

stom-designed product

These rigorous inspections are in addition to the Quality Control procedures applied at every stage of production in accordance with ISO 9002 and guarantee the impeccable quality of Valdunes' products.



◀ QUALITY CONTROL AT EVERY STAGE OF PRODUCTION.



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