



# K news

The European magazine of Leroy-Somer

15

SEPTEMBER 2005

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# Noisy arrival of new Directive

Hearing loss, as a result of overexposure to noise, is the occupational disease most often reported in the countries of the European Union. It is not surprising, therefore, that Europe began taking a tougher stand in 2003. Union countries have six months left in which to adapt the new directive to their legislation. And businesses have six months in which to get ready...

Our life, at our places of work and elsewhere, is peppered with unwanted sounds that are varied in their intensity and aggression. When they exceed a certain threshold, in volume or duration, they can cause irreversible damage to the hearing system. The resulting loss of hearing translates, at best, into difficulty in perceiving higher-pitched sounds and, at worst, into socially disabling deafness. A noise level that is too high also increases stress and blood pressure, as well as the risks of industrial accidents, insofar as it drowns out the sound level of any alarms or colleagues' warnings...

## Noise here and there

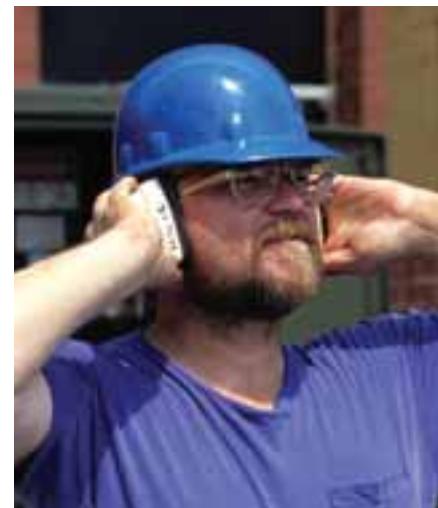
Contrary to generally accepted ideas, the noise issue is not solely the domain of heavy industry. The services sector, schools, health service and even professional orchestras are gradually being observed when researching this matter. The European directive issued in 2003 lowers the average sound level to 80 decibels, measured over an 8-hour day. This is the point at which the employer is obliged to take measures to reduce the noise, and to make available suitable personal protective equipment to workers. The directive establishes that 85 dB is the threshold at which the company must impose its usage and 87 dB as the limit not to be exceeded. As a comparison, the average sound level recorded in discotheques is between 80 and 110 dB. A normal animated conversation is between 50 and 60 dB, and a car radio at full volume reaches 140 dB.

The countries of the European Union have until 15th February 2006 to adapt the new European directive to their legislation. Companies will then be obliged to abide by rules that are generally stricter than those they apply at present. What means do they

have at their disposal for assessing the sound level, and for reducing it?

## Measure - how?

Various techniques can give us an idea of the noise level that reigns in a company.



The statistical analysis solution, based on measures repeated in various places, is useful in the case of companies that work with some fixed posts, where the noise can fluctuate. It allows us to establish the acoustic pressure to which workers stationed at these posts are subjected.

Dosimetry allows us to measure the noise level to which a particular worker is subjected during a working day, wherever he is and whatever he's doing. It is based on data continually recorded by a device the size of a wallet, worn by the worker for a whole day.

For companies that have fixed work posts and constant noise levels, it is possible to draw up a noise card, which enables us to then establish the sound level to which a worker is exposed when staying for a given time in a specific area.

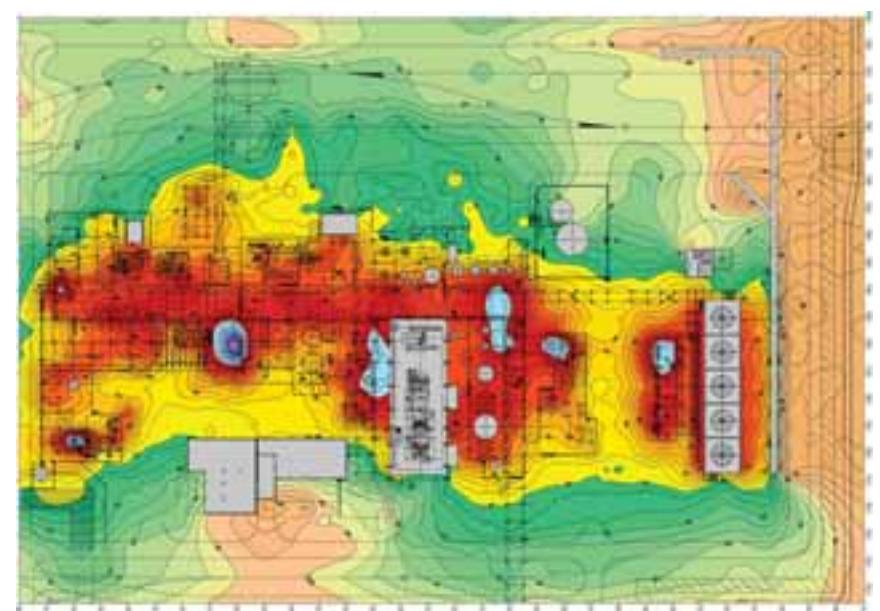
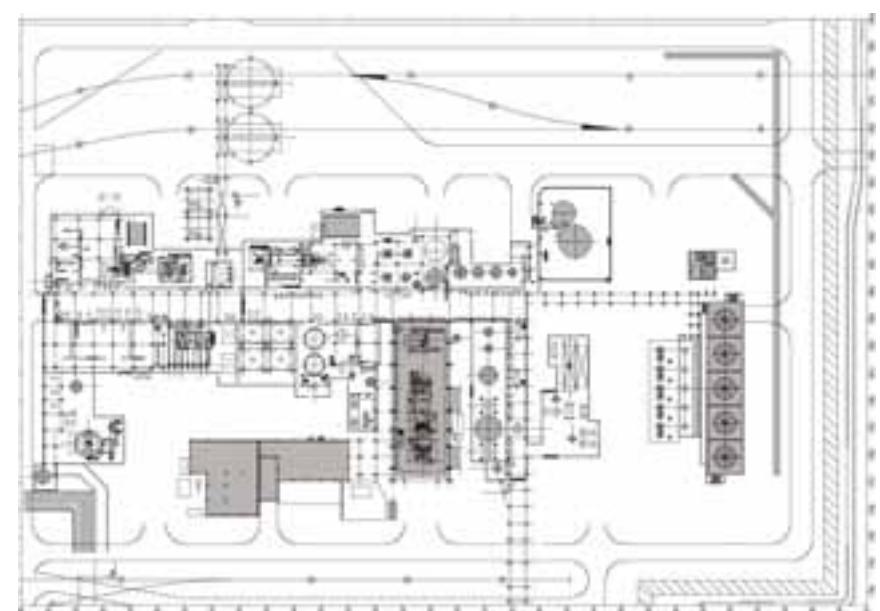
## Decibels ... and the rest

But decibels are not everything. The new European directive requires a real assessment to be made of noise-related risks. It intends to lead companies to take into account other factors that could aggravate the effect of noise, such as the presence of ototoxic (toxic to hearing) substances, or, again, the interaction with other vibrations that could increase the risk of impairing the hearing system.



## Reduce it - how?

To reduce noise, we must firstly envisage eliminating its source. A criterion that will now be automatically included in the specifications for new installations! Then, there are several methods for controlling noise at source: separation (choosing a separate location, enclosure, soundproof screens, absorbing vibrations with the help of suspensions or elastomer supports, etc.). Then come the collective noise-control measures: modifying the workspace, reor-



ganising the work with the aim of reducing exposure time, etc. The wearing of personal protective equipment should only

be envisaged as a last resort, when all the other possibilities of reducing the sound level have been exhausted.



### Sources and interesting links

- To find out more about European Week 2005 on health and safety at work, which will take place from 24 to 28 October and will focus on noise:  
<http://agency.osha.eu.int>
- The European Agency's information sheets on health and safety at work (<http://agency.osha.eu.int/publications/factsheets>) describe the noise issue (no. 56), its consequences (no. 57) and the various ways of reducing and controlling noise (no. 58).

# APPLICATIONS

## Revolution in oyster fishing



**BRUINISSE (Holland)** - For over a century we have been using the same technique when fishing for shellfish. The sail has been replaced by steam, and steam by diesel, but the way in which we fish for mussels and oysters hasn't changed. This year, a change is about to take place in Holland, with the supply, by the MAASKANT shipyard, of the new Yerseke 29 trawler (YE-29).

The old YE-29, which sank last year in Yerseke port, still sported a derrick mast to which the fishing ropes and dragnets (fishing nets in the shape of a pouch with a scraping tool at the bottom) were attached. When the dragnets were full, they had to be hoisted out of the water, then pulled onto the deck and, finally, emptied manually.

The new YE-29 is arranged entirely differently. There is no longer a mast. The dragnets are kept in the water behind the boat, suspended against a tip-up frame. As soon as the fishing boat reaches the patch where the oysters are found, the steel ropes that hold the dragnets are released. The whole manoeuvre is easily controlled from the bridge. When the dragnets - which total three in the case of the YE-29 - are full, they are mechanically raised and placed against the tip-up frames that pour the contents onto a conveyor belt.

"This whole process is a lot less complicated than before. In fact, the boat could operate

with just one man on board. But the crew will actually consist of two fishermen, mainly for legal reasons," muses Marcel van der Zwan, the manager of MAASKANT BRUINISSE. This company - which is not only a construction and engineering workshop but also a winch manufacturing and repair yard - is part of the DAMEN SHIPYARDS group.

The YE-29 nevertheless displays a whole host of new ideas. "Its design is totally innovative. In fact, we designed, in consultation with the principal, an entirely new ship. So, in current boats, there are generally two main motors situated at the back which, using reversing gears and propeller shafts, drive the propellers. There are also auxiliary motors at the front to drive the winches. The YE-29 only has one motor

at the front of the boat. It is actually a large generator that supplies 460 kW of electric power, used to drive various electric motors: two for the stem thrusters - each with 160 kW - and three for the winches."

"The whole unit is therefore a lot quieter and the ship can advance at a very low speed.





Traditional diesel motors actually deliver a specific power, with the result that the ship's initial power is quite high. However, you only need considerable speed when entering or leaving the port.

On the other hand, the dragging has to be done at the slowest speed possible," explains Mr Van der Zwan.

The stem thrusters, mentioned earlier, are also remarkable. "The thrusters are exceptional in that they each drive two propellers, which can turn through 360 degrees. This means the boat can be manoeuvred almost to the millimetre, which is essential for harvesting the oyster patch to the fullest. The two propellers have different diameters and turn in opposite directions: one pushes the boat, the other pulls it. In this way, any water stirred by the propeller remains calmer and a lot clearer, which also helps the fisherman have a better view of what is happening behind."

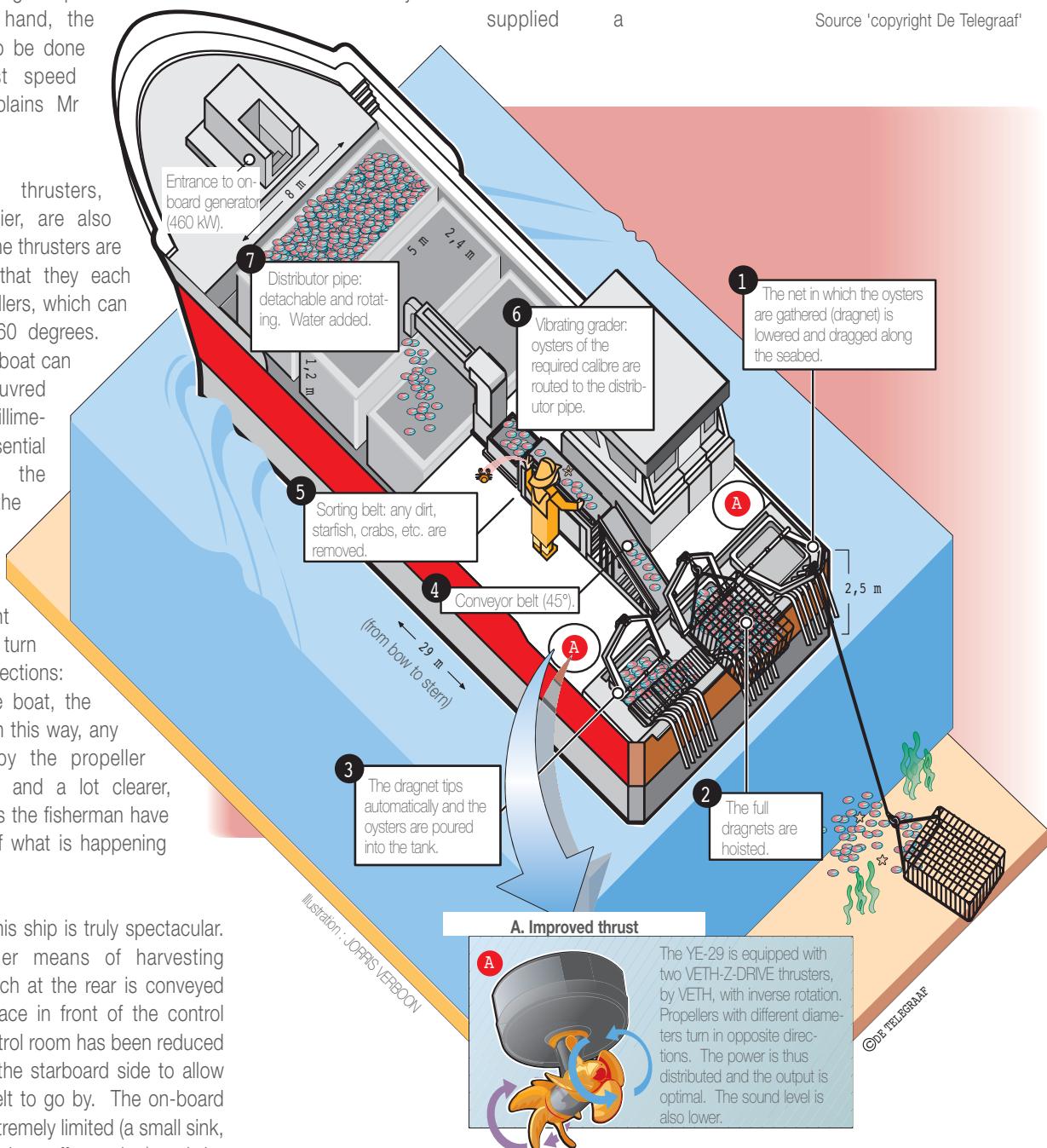
The design of this ship is truly spectacular. "With this other means of harvesting oysters, the catch at the rear is conveyed towards the space in front of the control room. The control room has been reduced and placed on the starboard side to allow the conveyor belt to go by. The on-board equipment is extremely limited (a small sink, a microwave and a coffee-maker) and the

man at the helm uses two control levers to control the thrusters and regulate the speed, as well as a few buttons to release the dragnets and hoist them. The equipment also includes, of course, a bathometer, a tracer and a radar."

Leroy-Somer Holland supplied PON POWER (CATERPILLAR distributor) with the generator positioned at the front of the boat, an LSAM49.1S4 intended to produce an electric power of 460 Kw for the 5 drive motors: two PLS315 electric motors for the VETH-Z-DRIVE thrusters, by VETH, to propel the boat and three LS250 motors with FCPL electromagnetic brakes delivered to ALEWIJNSE to drive the dragnet winches. Leroy-Somer HOLLAND also supplied a

22 kVA rotary transformer to ALEWIJNSE MARINE to regulate the electric system on board. The marine architects' imagination together with Leroy-Somer's experience in drive systems for the navy have enabled the construction of this technically revolutionary work.

Source 'copyright De Telegraaf'



# APPLICATIONS

## Hilge Pumps: The stainless steel experts



Pumps for  
beverage technology, foodstuffs  
technology, pharmaceuticals and  
biochemistry

The HILGE success story started in 1862 in Mainz's old town when brazier Peter Hilge converted a former laundry into a foundry and set about manufacturing fittings and pumps for the beverage industry. His work bore fruit in the form of the first German wine pump and the first beer pressure regulator, the latter of which was based on a rotary vane pump.

In 1962, Philipp Berdelle-Hilge, the great-grandson of the company's founder, achieved a milestone when he developed the first stainless steel centrifugal pump for the beverage industry. His use of deep-drawn rolled stainless steel, which was unheard of at the time, is something to which HILGE is still firmly committed today.



Given a bashing at the time, deep-drawn rolled stainless steel is today considered an innovative material for pumps whose non-porous surface is setting the standard in sterile process engineering.

The HILGE name is synonymous with hygienic design stainless steel centrifugal pumps. The company has numerous customers in many markets including beverage technology, foodstuffs technology, pharmaceuticals and biochemistry sectors all over the world. HILGE also supplies tailor-made solutions for customers' specific problems in the context of general industrial, environmental and surface engineering applications. The company manufactures single-stage and multi-stage end-suction and self-priming centrifugal pumps. These are designed and built in accordance with the specific requirements of Qualified Hygienic Design (QHD) and, in respect of cleanability, are certified in accordance with the test method described by the EDEG.

The company's processes and procedures meet the requirements of all standard regulations and guidelines including FDA, the EU's Machinery Directives and GMP, as well as those of national and international standards such as DIN EN, ISO and ASME.

The whole company and the entire manufacturing process have been certified in accordance with DIN EN, ISO 9001:2000.

PHILIPP HILGE GMBH & CO. KG became a member of the GRUNDFOS Group on 1 January 2004.

HILGE is looking forward to membership of the Group



bringing with it a global presence combined with a significant increase in sales.

### HILGE pumps with Leroy-Somer motors

The Euro-HYGIA I, Euro-HYGIA II and Maxana models are some of HILGE's most successful pump series. These pumps feature motors with special stainless steel motor shafts manufactured to meet customer specifications. The shafts, some of which come into contact with the product being processed, meet high standards of quality and are closely monitored for adherence to specific requirements, including those of Qualified Hygienic Design (QHD), in respect of their surface.

Hilge and Leroy Somer can reflect on a long history of successful partnership.



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# Naval defence applications - Shocking results

Leroy-Somer has had a long association with Naval Defence applications and developed a range of motors meeting stringent requirements of the many Navies of Europe and the rest of the world.

The range has been extended to include our Aluminium motors having passed shock tests required by the British Navy.

The tests performed according to Defence Standard 08 – 120 (NES 814) demonstrated the capability of this range to withstand 30g shocks in all directions, remaining captive and operational. This means that these motors can be fitted anywhere on submarines or surface ships when mounted above shock mounts or rigidly mounted on deck.



Motors mounted on Deck Shock Test machine



## Sample Test Certificate from QinetiQ

The range available is LS 90 frame to LS 280 frame representing powers up to 90 Kw. These can be supplied for all applications both new and replacement, recent examples include T45 and HMS Albion and refurbishment projects for the DLO previously known as Warship Support Agency.

See page 10 for CAST IRON RANGE

## LEROY-SOMER UK Start of a new era at Stockley Park



### HISTORY

#### ANCIENT TIMES

The land on which Stockley Park Stands has been a site of human endeavour for 250,000 years. Throughout its history it has witnessed the evolution of mankind and the way man has learned to adapt local resources to the best advantage. Bore the last ice age, Palaeolithic man and woman crafted primitive stone tools which were swept into the gravel underneath Stockley by the rivers and glacial melt waters. By 70,000 years ago the site was visited by Neanderthal man and the implements found in the Yiewsley gravel pits reflect a slow, certain progress over the centuries in the mental concepts and manual skills of these nomadic hunters and gatherers. As they improved their sharpened flint tool kits they became more efficient at feeding, clothing and sheltering themselves. In fact, the Yiewsley gravel pits, which were investigated

early this century, have yielded some of the most extensive deposits in this country of the tools knapped by Neanderthal man.

The more settled Neolithic people farmed the land and gradually received incomers who knew how to work metal. In 1975 a Bronze Age axe was found near Harlington Church and nearby there are clues suggested that a burial ground and settlement were established close to Stockley at this time. Certainly during the middle iron age there was at least one farming community harvesting wheat, barley and oats from the fertile ground. Archaeological excavations in 1985 and 1990 have revealed four circular huts and associated granaries, along with weaving equipment and the first evidence of industrial waste, metal slag.

#### MIDDLE AGES

The area provided the Roman capital of Londinium with much of its grain and the rural

nature of what was to become known as Middlesex prevailed through the Dark Ages. From this period comes the local name of Dawley, derived from an Old English word Leah indicating flat land in a river or a clear open space in a wood.

By the Norman conquest of 1066 the Park was owned by the manors of Dawley and Colham.

Although its ownership changed hands as power and wealth fluctuated, it seems likely that most of the land was used for arable agriculture for the succeeding nine hundred years. Accordingly to Dr Penelope Hunting, Stockley Park's historian, 'The weather, the harvest, the demands of their manorial lord and their church were the real concerns of the medieval inhabitants of Colham, Hillingdon and Dawley'. They also had to live through the great floods, sheep and cattle plagues and the Black Death.

## POST 1500s

Dawley itself was deserted by 1515 because arable land had been converted to pasture and had so deprived the ploughmen of their livelihood. In the mid-seventeenth century the area was enclosed by Sir John Bennet (after who Bennetsfield Road is named) to create a country gentleman's Park, planted with trees and stocked with deer. Sir John was an absentee landlord, being the Deputy Postmaster to King Charles II and living in Westminster, but he did rebuild Dawley House, beyond the south-east corner of what is now Stockley Park, complete with orangery, menagerie, orchards and a furze ground (commemorated in today's Furzeground Way).

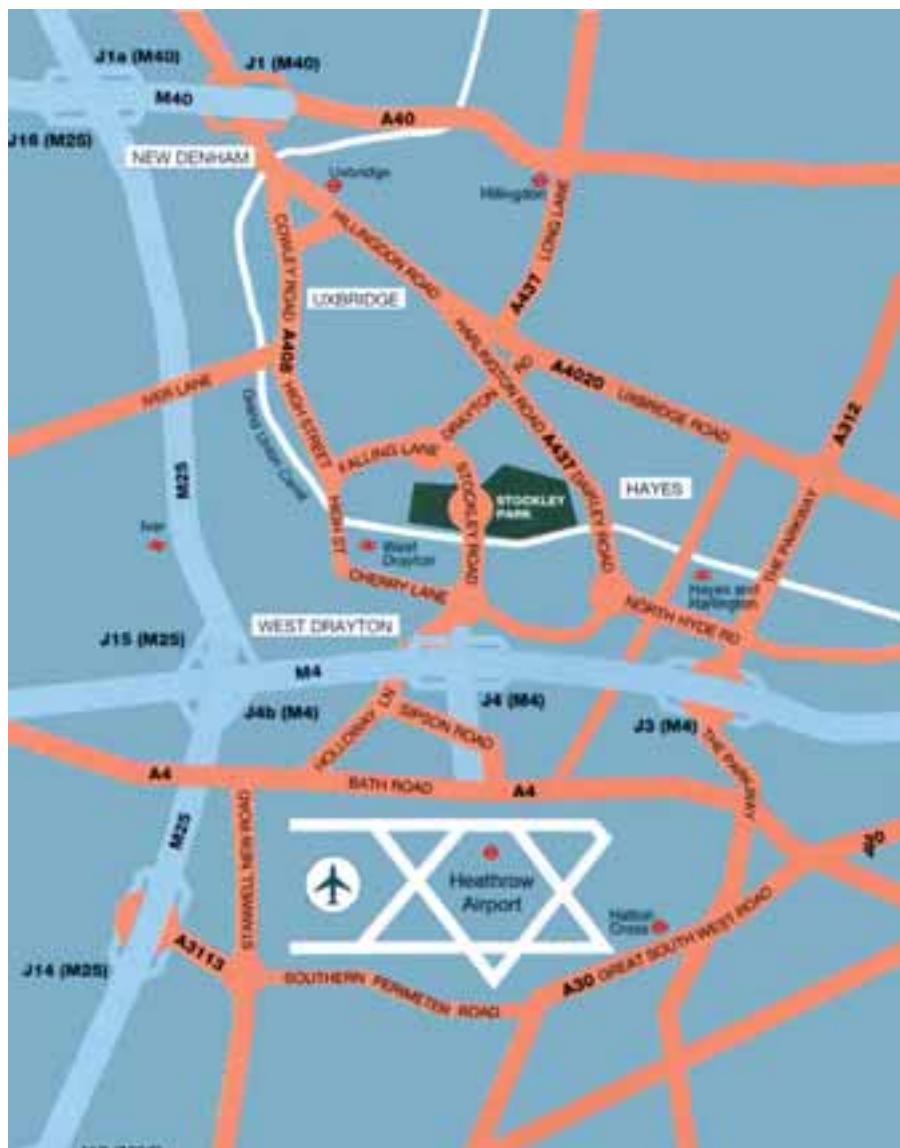
## INDUSTRIAL REVOLUTION

The opening of the Grand Junction Canal in 1805 set the scene for a change of use of the land over the next 150 years. Gradually agriculture gave way to brick making, because of the fine deposits of brick earth.

Many of Kensington's grand museums are built of 'Cowley stocks', bricks which came from this area and whose fame eventually gave rise to the name Stockley.

When the brick earth was exhausted early last century the underlying gravel was extracted.

During the 20th century the land fell into disrepair. The extraction industries left holes which were filled with domestic refuse and the site became polluted and hazardous. Although a Greenbelt site, it was a no-man's land until the developers of Stockley Park, approached Hillingdon Council with a Master plan in the early 1980s. In 1985, the derelict wasteland that had been created began to change and a new chapter in the history of Stockley Park had begun.



## 2005 LEROY-SOMER UK

The vast improvement in modern logistics has enabled the company to commence a new era of service to the UK market. Using direct deliveries from our production units to our customer sites we are able to benefit from a Head Office facility that has the most up to date communication capabilities and reducing our need for expansive warehousing space.

We are pleased to extend a warm welcome to any of our customers who may wish to visit us in our new location.

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## Naval defence applications

There are three ranges of Cast Iron motors which have been designed for extremely arduous requirements of European Navies and meet very exacting standards set by DCN. These include high levels of resistance to shock, low noise levels and particular vibration levels according to ships specifications.

The first model is the MNR which is a reinforced standard with resistance to shock levels of 169g remaining captive and 120g remaining captive and operational.



The second model is the MNN which is the reference model and is capable of withstanding shock levels of 21g remaining captive and 15g remaining captive and operational.



The third model is the MNI industrial standard which can be used in secondary role applications.

In each case these motors are available for development in adapted versions to suit particular specifications based on commercially off the shelf products.

# CEB - Power and reliability

The "Constructions Electriques de Beaucourt" company, better known as "CEB", has been part of the Leroy-Somer group since 1982. The company's industrial experience dates back to 1772! Without neglecting its traditional ranges, CEB has gradually specialised in the design and manufacture of high-power low-voltage electric motors (up to 1800 kW).

## A diversified market

Wiser for its long industrial experience in numerous sectors of activity, CEB has become truly adept at designing high-power adapted motors and in manufacturing ranges with particular technologies that require a high level of reliability: safety motors for explosive atmospheres, motors for high



temperatures (400°C over 2 hours), auxiliary traction or ventilation motors for the railway, motors for the Navy (surface vessels or submarines) or, again, motors for nuclear power stations (irradiated atmosphere or otherwise), etc.

The engineering sector, especially in the oil and gas domain, is also a sizeable market for CEB. This market is relatively difficult to access since, to take part in a call for tenders, the operators must have considered you as a potential supplier. Now only the main international groups that, like Leroy-Somer, have a solid worldwide commercial network, manage to land the title of "recommended supplier", the required work being carried out by Leroy-Somer's specialist teams. So, the construction of a new offshore platform can generate several hundred tenders from various subcontractors.

CEB is also very active when it comes to assisting the end user. This services market is being thoroughly developed, especially in the sectors where the machines' reliability is of the utmost importance. More and more, the user expects the manufacturer to accompany him throughout his installation's life. Being very resourceful, CEB's experts are ready to travel the world to follow the main world leaders and provide them with rapid assistance (expertise, on-site repairs, etc.).

## A structure that makes a difference

With diversified markets and miscellaneous requests. In order to be able to execute a one-off order for two stem thrusters, to be delivered 6 months apart, as well as develop a project from start to finish, CEB has set up a commercial and industrial structure in line with its ambitions.

One of its main strengths is the diversity of the skills available in its research department. "At all levels, we attach great importance to forming teams with different approaches to problems," explains Nobel Hoyos, CEB Manager. "With their very varied experience, these teams have a better understanding of all the problems raised by customers. And they are capable of finding the right, full answer to the most demanding specifications."

CEB is not a motor manufacturer like the others. Because it offers, among other things, high-power electric motors, it must meet specifications that are sometimes extremely complex. The result: more than one in two orders makes a detour via the research department to undergo various minor - or more major - adaptations there.

Faced with such demands, CEB is also a past master in producing and distributing technical files: an essential skill for sectors where the documentation that goes with a product is sometimes just as important as the product itself. On a regular basis, the





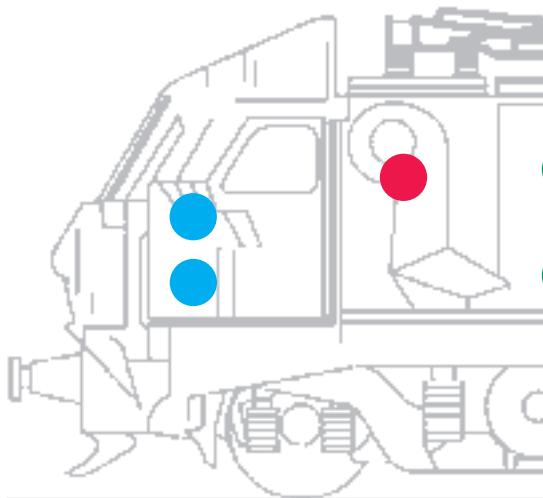
## Auxiliary motors for railway applications

research department is thus led to draw up technical files or maintenance files for almost unique applications.

### Deadlines and resourcefulness

Deadlines are another point on which CEB intends to make a difference. "Resourcefulness is the key word in today's market! For a company like ours, which experiences extreme workload variations from one week to the next, it is essential to be able to react very swiftly and deliver our products to the customer's chosen location at the right time." The company is therefore committed to the vast step of continually improving its performance at each stage of its activity: processing orders, series

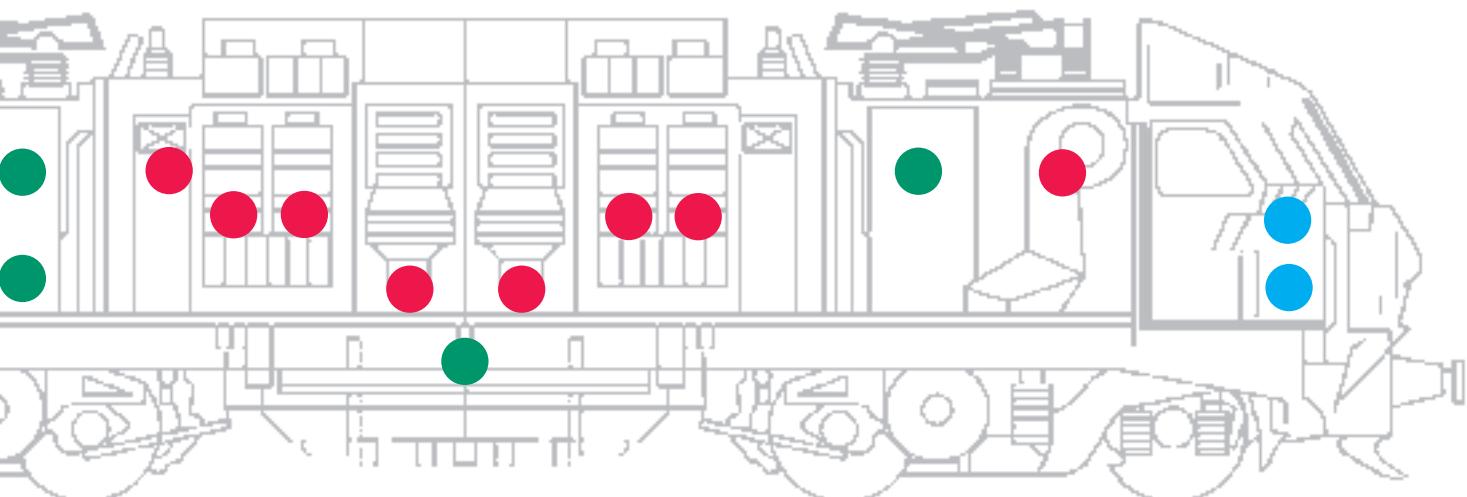
changes (especially when producing special - and often unique - items), regulating tools, etc. At the same time, it is rationalising production flows, giving the people involved at all levels more responsibility and making its supplies more reliable... So many self-improvements to enable it to respond more quickly and more efficiently to the most varied orders.



High-speed train (TGV), regional express train (TER), tram, heavy or light underground train... The railway sector is a complex market, tied in with public or private investment programmes that can extend over long periods. For a TGV programme, for example, you can count on five years from the first call for tenders to the final decision to launch the project. The construction phase is spread over about ten years. As for the operating period, it can last about thirty

An auxiliary motor is "on-board equipment", likely to undergo vibrations and shocks, as well as a wide range of temperatures (from 30 to 90°C), and is fed by a static converter. This type of feed generates low-quality sinusoids and results in the coil aging rapidly.

To meet these technical requirements, CEB has developed ranges that are available in 4 levels, from the standard industrial motor



- Auxiliary traction application motors
- Compressor and pump drive motor
- Air conditioner motors

years. During this time, the supplier must guarantee the continuity of his technical assistance with these products.

Railway applications are based on two types of functions: traction functions and others, called auxiliary functions. The latter are usually classed according to their criticality threshold. The cooling of traction motors or braking rheostats are the most critical functions. If there is a fault or breakdown, it brings the train to an immediate standstill! Air conditioning - for passengers' comfort, or the opening of doors, are other important functions.

With almost 30 years' experience and over 250,000 motors in operation throughout the world, CEB is capable of supplying all the auxiliary motors for railway application. Only traction motors are not included in its offer.

(level 1) to the level-4 motor with coated technology, which possesses a very resistant motor at its heart, which is particularly well suited to auxiliary traction functions.

The compliance, reliability and longevity of such equipment are obviously essential. In the railway sector, the Mean Time Between Failures is vital for operators. Leroy-Somer's motors provide a particularly high Mean Time Between Failures, in the region of 1.5 million hours!



System 4 protection coat technology

## Water cooled motors - an answer to the noise problem

For some months, sales of water-cooled motors have been increasing rapidly. Faced with more and more demands and increasingly heavy environmental constraints, Leroy-Somer has developed a full range of electric motors cooled by water - the SLSHR (Steel Leroy-Somer Hydro Refrigerated) range.

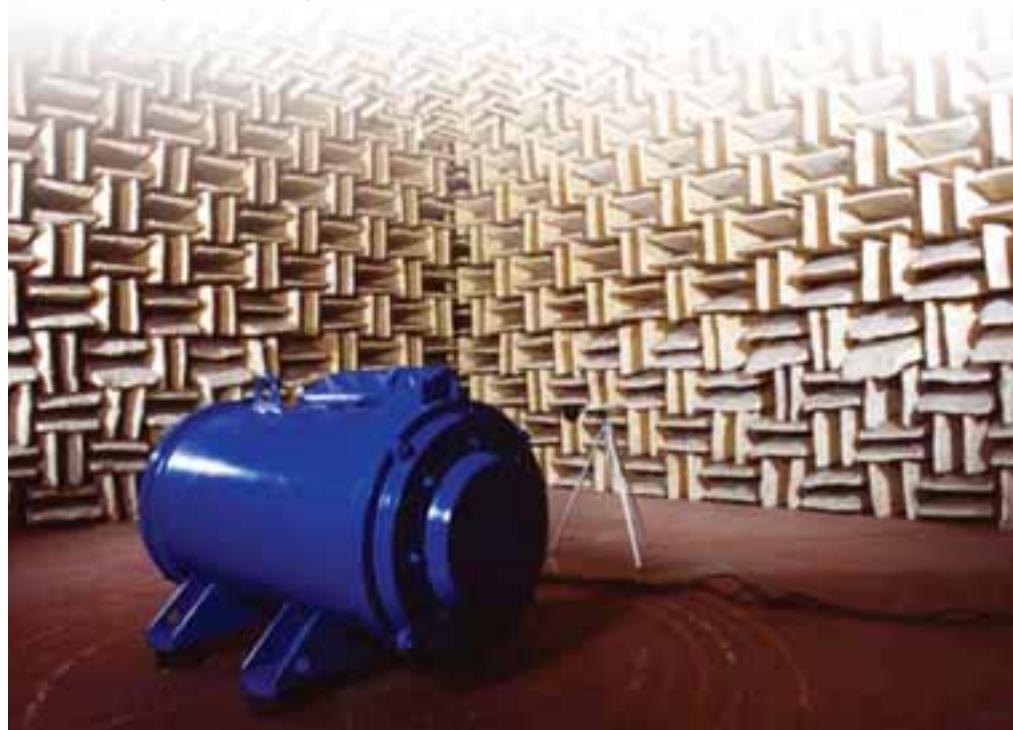
Every electric motor releases calories that, in order to guarantee normal working, must be dissipated. It is the integrated fan's job to ensure this. Either air flows through the inside of the motor (open motor or IP 23), or it flows outside, to comply with certain ambient constraints (closed motor or IP 55).

Cooling by water is much more efficient than cooling by air. It therefore helps increase the motor's power-weight ratio. So, a motor cooled by water, with a shaft height of 500 mm, is capable of developing 1800 kW of power, whereas the same closed motor, cooled by air, will achieve a maximum power of 700 kW.

The second trump card played by SLSHR motors is the lack of fan, the main source of noise emitted by electric motors, which means that sound emissions can be reduced by a factor of eight. A PLS 315 LD, 400 kW, motor generates a sound level of 86 dB, whereas the same motor cooled by water (SLSHR 355) does not exceed 70 dB. In some cases, this criterion alone can be a decisive factor in choosing a water-cooled motor.

### A combination of advantages

To optimise the performances of his customers' machines, Leroy-Somer has a wide range, capable of complying with very



varied constraints, both in terms of products and technologies on offer. Generally, it is after a study based on several criteria, both technical and environmental, that the water-cooled motor is going to stand out as a financially interesting solution. If a customer has, for example, limited space in which to install his machine and the noise factor is important, choosing an SLSHR motor can prove the most profitable: doing away with the noise-reducing casing, reducing weight and size, making cleaning easier...

### A full range

Leroy-Somer is now offering a full range of SLSHR motors, up to a shaft height of 500 mm and a maximum power of 1800 kW. The applications are numerous and varied: stem thrusters, high-speed test beds, pumps, fans, compressors, extrusion machines, .... Obviously, the prior existence of a water system or a system that uses any other fluid is an additional advantage.



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# SLSHR, a motor adapted to its environment

## Closed motor IP 55 or IP 56 with a steel casing

The SLSHR motor is an IP 55 or IP 56 closed motor, with a steel casing that enables it to resist the harshest environments and thus give access to entirely unexpected applications, such as the motorisation for a pump on a ships deck, directly exposed to regularly breaking waves.



## Eight times less noise

A growing number of users are asking for a reduction in sound emissions from rotating machines. The SLSHR motor is a solution that remains well below the limits established by law.



## No influence from the outside temperature

No longer limited by high ambient temperatures ( $> 60^\circ\text{C}$ ) or altitudes above 1000 m.

## Reducing the size of the machines

The lack of fan means the motor's mass and volume can be reduced by 30%. The weight reduction can avoid having to reinforce a detachable structure in certain situations.



## More room

Unnecessary to make space around the motor to provide good ventilation since the cooling system is internal.

## No risk of clogging up the ventilation

In some industries - textiles, for example - when fibres settle on the blades of even a closed motor, they gradually block the openings and thus put the heat exchange at a disadvantage.

## Very easy to clean

Thanks to its smooth casing, the SLSHR is particularly well suited for food-processing applications by guaranteeing an environment free from any impurities.



## Improving the output of electric motors

By doing away with the ventilation system, it reduces losses and, therefore, lowers the electricity consumption, which represents 90% of the cost of owning an electric motor spread over 10 years.

## Variable speed use

The water-cooling device is independent of the motor rotational speed. It can therefore provide uniform torque over a wide range of speeds, especially at high speed a typical example might be for test beds in the car industry.



## Reducing machine maintenance

For motors with a shaft height of over 315 mm, the cooling system for the casing also goes into the bearings. This helps lower the operating temperature for the bearings and extend the lubrication intervals (up to three times).

Industrial process

Variable speed

8H30 G.M.T

Regulating the flow, the pressure, and the temperature, controlling a brake, enabling operator dialogue, integrating into the existing network.

As easy as possible and for the lowest cost.



Systech - Credit photo

## THE LEROY-SOMER SOLUTION

DIGIDRIVE SK > New > Simple > Compact and economic > From 0.25 to 4 kW

Your machines performance depends on it. Transforming energy into movement is one thing. Making the movement intelligent is another. The DIGIDRIVE SK, the latest arrival in LEROY-SOMER variable speed drives, combines, in a small volume, numerous functions that enable you to easily handle, control, supervise and modulate all the machine's movements.

You can ask anything of it. Try it for yourself.



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