# LS NEWS

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# Fire-fighting: towards European harmonisation

**Every year the human and economic cost of fires is extremely high. Catastrophes such as those of the Mont Blanc tunnel in France and the Gothard tunnel in Switzerland aroused strong emotions in public opinion. The authorities are today becoming aware of the need to harmonise and strengthen existing regulations.**

Prevention is a key factor in fire fighting. It has to meet several objectives: firstly, to eliminate the causes of fires, then to ensure people's safety (evacuation, easy access for the emergency services, etc.) and finally to bring the fire itself under control (compartmentalization, smoke extraction, etc.) before it becomes totally out of control.

The measures taken vary depending on the type and purpose of each building: tunnels, high-rise buildings, electrical systems or stocks of inflammable products. These measures are in response to a complex set of national and international regulations. A situation that is causing some confusion.

**EN 12101-3, the new European standard**

In a fire the flames are not the prime cause of death, but rather the escaping fumes and gases. The new European standard, EN 12101-3, deals specifically with smoke and heat exhaust systems.

As the text of the standard shows, the establishment of a system such as this aims to create a smoke-free zone, making it easier for the emergency services to intervene.

A distinction is generally made between natural extraction (using the ability of hot smoke to rise) and mechanical extraction achieved with the aid of extractor fans and their motors. Whether the extractor fans are helical or centrifugal, the electric motors are subjected in every instance to extreme conditions, hence the importance of carrying out fire-resistance tests.

The EN 12101-3 European standard that will be implemented as from April 2005 specifies the requirements and provides the test methods for smoke extractor fans and their motors.

It also introduces a few new concepts: the 'dual purpose' motor concept, the responsibilities of specifiers and manufacturers, the concept of checking the process of manufacturing motorised fans and the definition of time/temperature categories.

**Dual-purpose concept**
Products manufactured according to this standard must be capable of providing daily comfort ventilation, as well as smoke extraction in the event of fire. This 'dual purpose' concept involves new requirements for winding manufacture, for the quality of insulating materials, and for the paint that has to withstand high temperatures. For manufacturers like Leroy-Somer, this involves building equipment that is both reliable and competitive.

The standard nevertheless allows the use of extraction fans, which are only energised in an emergency ('emergency ventilator'), and this means that the existing systems can be kept. In the end it seems clear that it is in the managers' best interest to select dual purpose extraction fans both in terms of cost (a single motor can handle day-to-day and emergency running) and consistency with the changing regulations. Today, Leroy-Somer is planning, and has actually selected "dual purpose" as their basic range.

**Responsibilities of the manufacturer and the specifier**
The responsibility of the specifier (that is, the manufacturer of the fans) is to define the characteristics of the equipment in order to ensure that the system runs correctly and comfortably for the time set.
The fan manufacturer's role is to manufacture the equipment in compliance with the standards and specifications provided by the customer as well as to indicate the operating and maintenance conditions of the motor for "dual purpose" products.

**Monitoring the manufacturing process**
The ranges of HTA and HTF high-temperature motors are approved at present by the CTICM (Centre Technique Industriel de la Construction Métallique), a notified laboratory. Tests carried out by the CTICM have until now been based on load simulations in particular (power, voltage, speed, etc.).

Today, a new test method has to be applied. The main tests have been carried out either with an extraction fan (configured as a motorised fan), during which the motor is subjected to mechanical loadings induced by the extraction fan, or with the motor alone on a load bench where the mechanical effects induced by an extraction fan are simulated. It is not just the electrical options that are tested, but the mechanical components as well (bearings, mounting arrangements, etc.).
Furthermore, the new standard, as in the case of the European Directive on potentially explosive atmospheres (ATEX), involves an audit of the production units and of their Quality Assurance System.

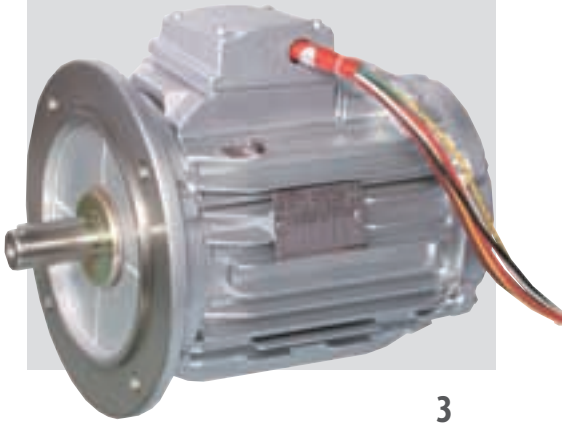
**Definition of time/temperature categories**
The EN 12101-3 standard defines different categories of use (time/temperature category). For example: an F200 motor must be able to withstand temperatures up to 200°C for 120 minutes. The F300 itself has to withstand a temperature of 300°C for 60 minutes and F400 temperatures up to 400°C for 120 minutes.

## Leroy-Somer's new ranges of smoke extraction motors

Leroy-Somer was the first manufacturer in the world to have designed a motor specifically for smoke extraction in a fire. The first Lucifer range was introduced to the market over 30 years ago!

Today, Leroy-Somer produces two new ranges of motors that comply with the requirements of the new European standard. The LSHT aluminium range is recommended for temperatures not exceeding 300°C. The FLSHT cast iron range, in contrast, is particularly well suited to the "dual purpose" fan for systems that have to withstand temperatures of 400°C and more.

Leroy-Somer's two ranges of smoke extraction motors have been certified by an independent, notified body, the CTICM in France.



# Bredel introduces the SPX25 and SPX32 peristaltic pumps

**Bredel Hose Pumps, world leader in the manufacture of high-pressure peristaltic pumps, is expanding its SPX range. The new SPX25 and SPX 32 models, as well as the other pumps in this range, are manufactured using their patented direct couple drive.**

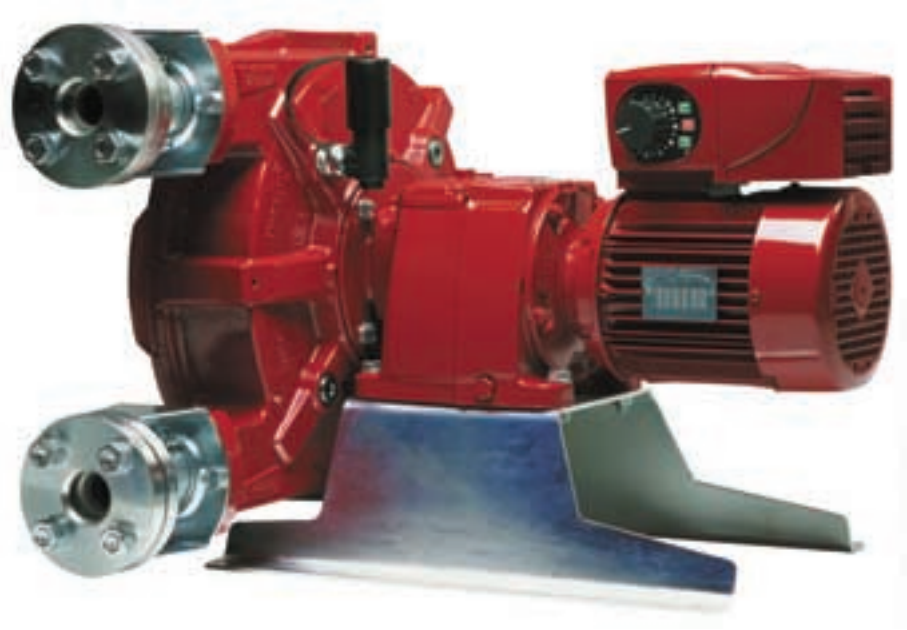

Benefiting from experience acquired throughout the world with over 65,000 peristaltic high-pressure pumps in the most varied industrial applications, the SPX25 and SPX32 models have a longer operational life, are easy to maintain and have a 30% smaller space requirement for installation. The maximum capacity of the SPX range of pumps is 80m3/hour. The pumps comply with the EHEDG and ATEX standards.

At the heart of the pump is a highly strengthened hub, onto which a rotor is mounted. The stresses at the centre of the pumps are absorbed by double-row ball bearings. The peristaltic pump is mounted directly onto the actuators, using their respective bearings, eliminating the need for coupling, alignment and casing required in a traditional construction.

The Bredel peristaltic pumps provide accurate, reliable pumping and dosing. They are particularly suited to pumping difficult fluids (abrasive, corrosive, high viscosity, friable, crystallising, or even fluids that have a combination of these characteristics). Peristaltic pumps have no joints, valves, membranes, stators, rotors or other often expensive parts subject to wear, which come into contact with the pumped fluids. The only part subject to wear is the hose, which can be simply and quickly replaced.


The cover, fixed with just 4 bolts, provides easy access to the shims. The time needed to adjust or replace the shims is thus reduced to a minimum. Much simpler hose clamping has also reduced the time required to change the hose of these SPX pumps.

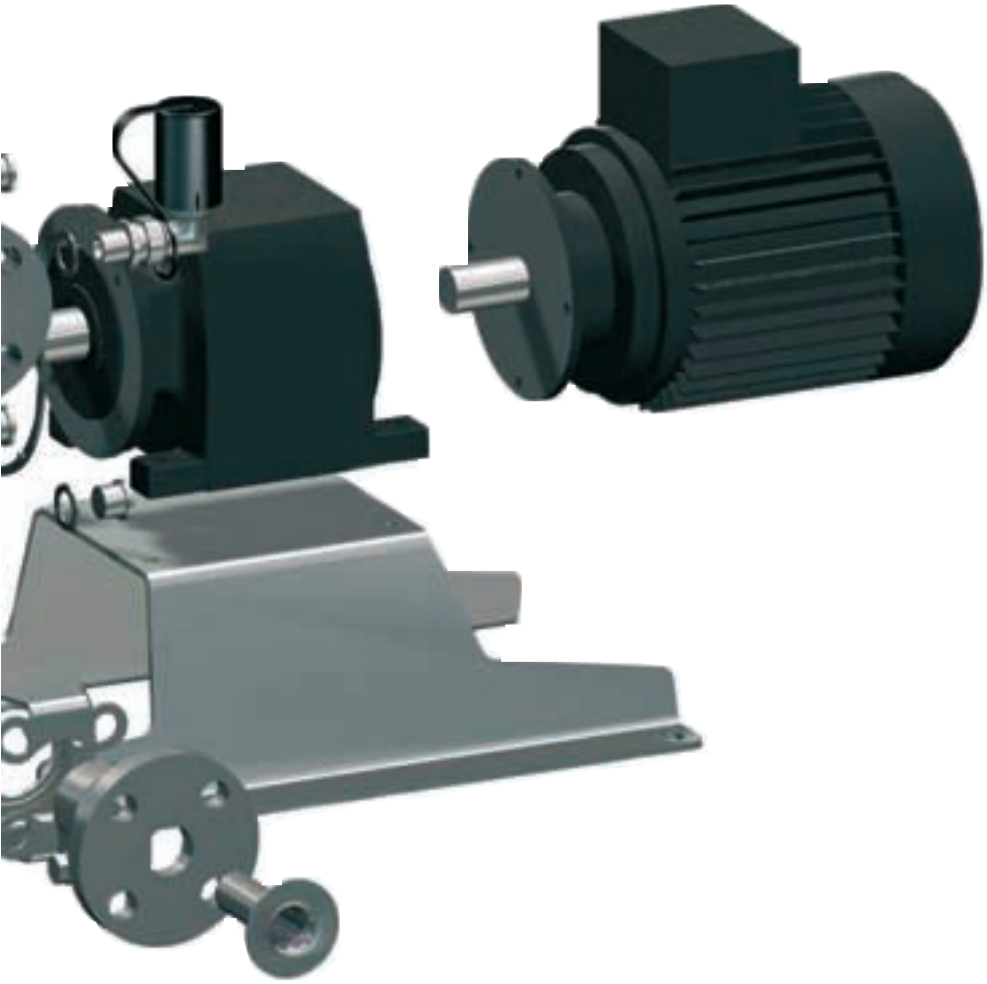
Bredel peristaltic pumps are able to meet the strictest requirements in many industries, such as chemical, food, brewing, pharmaceutical, sewage treatment, ceramics and paper



industries as well as the construction sector.

Bredel have selected Leroy-Somer's motors for their new SPX25 and SPX32 models. Leroy-Somer was brought into the project at a very early stage in order to provide the end customer with a complete and fully synchronised system. The Leroy-Somer drive is made up of an LSMV motor integrated with a CB 3000 gearbox, the output shaft of which has been specifically designed for the SPX25 and SPX32 models. An optional Varmeca frequency inverter is also available.

With Bredel Hose Pumps' SPX range, the future of high-pressure peristaltic pumps is assured!



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# Recovery boilers for combined heat and power plant : reliability and availability

**CMI is an industrial group specialising in mechanical engineering. The group concentrates its activity in the engineering sector and services to industry, mainly on three client sectors: energy production, the steel industry and defence. It employs 1800 people, principally in the Benelux countries and France. It has many commercial offices throughout the world, notably in the United States, Singapore, Saudi Arabia and China.**

In 1966 CMI built its first heat recovery boiler for combined heat and power plant (15MW). Since this world first, produced for Socolie (Belgium), CMI has gradually been developing the concept for making it increasingly reliable and available, two essential criteria for ensuring profitability of this technology.

In 1974, CMI began taking on the world market and installing over a hundred heat recovery boilers in many countries: Turkey, South-east Asia, Indonesia, India, Malaysia, etc.

Today, CMI is one of the world's three main energy recovery suppliers for combined heat and power plant. Its customers consist of turbine manufacturers, complete plant suppliers and power station operators.

The efficiency of a gas turbine is between 30 and 35%. Instead of being discharged into the atmosphere, hot gases (500°C) are recovered via large boilers that will heat a water circuit and convert this water into superheated steam. With this technology, 50% of the gases recovered will be converted into electricity. This type of combined heat and power plant therefore gives a final output of approximately 55%.

Gas turbines have the advantage of quickly being operational while not requiring too heavy an investment. On average, they produce their first megawatt just 18 months after the site launch, compared with 5 years for a nuclear power station and 10 years for a hydroelectric dam. One of CMI's assets is precisely that of being able to provide boilers at very short notice thanks to its modular design and its ability to produce all the critical components in-house.

*Combined heat and power plant (360MW) for Electrabel (Ghent - Belgium)*

In the so-called "balloon" boilers, pressurised water is circulated through heat recovery exchangers assisted by circulation pumps that improve the system's reliability. In fact, the temperature of gas entering the boiler varies according to the network's demand for electricity. The pumps therefore provide stable circulation whatever the variations in the hot gas coming in.
For many years now, Leroy-Somer has been one of CMI's preferred suppliers of FLS or FLSC motors required to drive the various circulation pumps installed between the balloon and the different exchangers that make up the boiler.

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# Law-Denis Grain Dryers

**Since the formation of the company 30 years ago, Law-Denis has become a trusted and respected name in the grain machinery industry, synonymous with high quality robust equipment. The product range covers all aspects of bulk materials handling from conveying, cleaning, separating, grading, aeration and drying.**

Law-Denis is the UK's largest manufacturer of continuous grain dryers, specialising in the upper segment of the market providing capacities up to 300 tonnes/hour.

From the manufacturing base at Wickwar near Bristol these huge grain dryers are manufactured and then supplied to customers for drying large volumes of cereals, both in the UK and around the world.

In this year alone, installations in the UK, include a 75 tonnes/hour cereal dryer for a large Hampshire co-operative, a 100 tonnes/hour cereal dryer for an East Anglian grain merchant and a hefty 50 tonnes/hour malting barley dryer for the UK's largest maltster (equal to 135 tonnes/hour if drying feed cereals).

Besides the UK, Law-Denis have been active for many years in the export market and this year supplied large dryers to New Zealand, Turkey, Australia, Latvia, Kenya and to China which is one of success stories for Law-Denis, with a total now of six huge brightly clad dryers supplied over the last three years.

To ensure that the grain dryers, with the large volumes of air employed, do not affect the environment, they are equipped with special dust control fans.

These fans are one of the key components of the dryer where reliability and efficiency are a necessity when working 24 hours/day, 7days/week.

Leroy-Somer 22kW and 30kW LSPX motors were the obvious choice and are required to operate in a hot, humid, dust-filled atmosphere. It is imperative to use motors, which not only comply with ATEX directive 94/9/CD but also reliably fulfil the arduous requirements made on them.

The bright yellow coloured LSPX motors clearly identify them from a standard motor and have become a standard for the Chinese market not only for the safety feature but presumably meets the desire for colours that stand out in a crowd!

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# Harsh environment! No problem!

Materials handling in highly corrosive atmospheres or other harsh environments present special challenges when coupled with high torque, precision braking and precision electronic control. Here we see two examples where the solution is provided from the vast product range, drawing on nearly a century of design and manufacturing experience of drive systems.

## Heavy duty brake motor with speed control continuous ship unloader

**Complete drive system for a continuous ship unloader demonstrates the versatility of the product range from Leroy-Somer.**

**4 separate drive systems**

(1) Boom slewing

(2) Boom travel

(3) Bucket elevator drive

**Drives:**

**(1) Boom slewing**

- 6 motors FLS 200L, 18.5kW 6 pole, FCPL S4 DC brake at 180Nm fitted with Forced ventilation and encoder

**(2) Boom travel**

- 8 motors FLS 225ST, 37kW 4 pole, FCPL 60 DC brake at 260Nm fitted with Forced ventilation and encoder

**(3) Bucket elevator drive**

- 4 motors FLS 315ST, 110kW 4 pole, FCPL 88 DC brake at 500Nm fitted with Forced ventilation and encoder

**(4) Bucket elevator slewing**

- 6 motors FLS 160L, 11kW 6 pole, FCPL 54 DC brake fitted with Forced ventilation

## Operation:

The unloader is fitted with an integral Bucket Elevator in a central shaft suspended from the boom with a low profile bucket inlet feed.

A counterweight balance system allows the unloader to be swung into position in the ship's hold where the coal is drawn in and up the elevator. It is discharged into a spiral chute within the boom and from there to an inclined belt conveyor.

(4) Bucket elevator slewing

# Jacking motors for oil rig installation

**Drives :**

**Jacking motors** - 72 motors FLS160 FAP 6 pole and brakes with manual hand release

# 600 Lathes

**600 Lathes is a trading name of The 600 Group PLC the largest UK owned manufacturer of machine tools. The company has two main brands Colchester Lathe and TS Harrison both established in the late 1800's and have become world renowned.**

Fresh thinking and new advances in machine tool technology, has enabled both of these companies to enjoy successful positions in their respective markets. Products are sold through a global network of distributors often in the same countries where Leroy-Somer has a subsidiary.

The photograph shows an example of the Harrison Alpha range of machine tools, using powers from 7.5kW to 15kW which includes the Alpha U 1330U, 1400U, 1460U, 1550U, Alpha S 1400S, 1330S, 1460S, 1550S and Alpha T 400T, 330T, 460T, 550T.

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Early designs of lathes requiring a variation in speed for working a variety of materials would have used a gear change unit; today inverters and variable speed motor technology match the demand for infinitely variable speed change.


Machine tools require high precision of concentricity and balancing but often at extremely high speeds, a motor designed with specially balanced components meets this challenge.

The 600 Lathes specification for balancing and vibration requires levels and tolerances far superior to that of standard motors.

These motors are required to run up to 6000 rpm for the variable speed ranges.

Leroy-Somer presently supplies 14 different designs with further prototypes in development.

Colchester is probably the most famous and respected name for lathes in the world.

This photograph shows one example from the range of the highly successful Tornado 2 and new 3 Axis driven tool CNC turning centres through to the Combi series of CNC / manual combination lathes, and the world renowned series of geared head and variable speed centre lathes.

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# Vincent Van Gogh: a man of influence

**If it is true that the work of Vincent Van Gogh had a considerable impact on a great many artists, its is also interesting to note that he himself was heavily influenced by classical or contemporary masters and by the artistic trends of his time.**

The world of the young Van Gogh was bathed in painting through contact with two of his art dealer uncles. He himself was also an art dealer for a time with his brother Theo and enjoyed collecting the works and reproductions of the great 17th century Dutch masters, as well as of contemporary French, Dutch and British artists. Coming, as he did, from a Protestant background, a minister's son, Vincent Van Gogh showed himself to be highly

sensitive to the religious nature of the paintings. He very quickly discovered the works of Rembrandt, whom he regarded as one of the greatest painters of all time.

### Millet: a constant inspiration

It was not until after 1880, when he decided to devote himself totally to his art that his tastes changed. Nature in particular was an inspiration to him and was a comfort to him when life brought him his share of disappointments and suffering. Of the artists Van Gogh admired

throughout his life, Jean-François Millet held a key position. Inspired by this representative of the realist movement, Vincent used the rural qualities that he idealized in some of his works. The work of this master was a constant inspiration, from his early drawings in Holland to the last variations on the theme of the Sower painted in St-Rémy.

### Delacroix and the theory of colour

When Van Gogh settled in Nuenen in 1883 where his parents were then living, he painted several paintings in dark tones. He was reading Zola and writing about the art of Delacroix and Fromentin. Delacroix believed that tones had to be affirmed with a strong presentation of each colour.
The Impressionists used this technique of juxtaposing dashes of complementary colours, forcing the eye itself to lump these colours together in vibrant shades. Van Gogh adopted this technique but he also juxtaposed areas of complementary colours. On the subject of the Sower, for example, it is the effect of the contrasting colours that is so crucial: yellow and its variations, replace the blue of the sky, the yellow of the fields is replaced with a purple or brown and the colours are inverted.

### The Japanese model

Japonism had considerable influence on young painters in the second half of the 19th century. Van Gogh had a very precise and very personal concept of Japan, and Buddhist theories fascinated him. He did not believe it was enough to copy Japanese art, but thought instead that the cultural life of this people should be explored in order to draw personal, creative impulses from them. In Japanese engravings, Vincent valued above all this rudimentary taste for colour.

Graphic courtesy of www.vangoghgallery.com

### Gauguin: a stormy friendship

In March 1886, discouraged by his lack of success, Vincent Van Gogh went to Paris. He discovered modern painting and his palette of colours lit up at his touch. Toulouse-Lautrec and Bernard influenced his painting. He gradually relinquished his preferences for rural scenes.
It was at this time that he got to know Gauguin, then little known, as well as Pissarro, the key figure of Impressionism. Van Gogh very quickly came to regard them as friends and dreamed of forming an artists' community with them. But it was with them that this project failed. When Gauguin arrived in Arles in October 1888, both men, brimming with talent, quickly discovered their differences.

Throughout his life, this tormented artist was constantly reassessing himself and tirelessly searching for new methods of expression in pictorial art.

# Leroy-Somer's approach to the environment

**Leroy-Somer do not consider their environment policy in abstract, it is in fact the result of an approach they initiated many years ago within the company. The manufacture of electric motors is not actually a polluting activity in itself, unlike the chemical industries that have had to set up sophisticated systems for combating pollution.**

**Leroy-Somer's priority is firstly to influence day-to-day behaviour: ecological awareness leads directly to economic advantages for the company. Waste, for example, is a cost. If it is regarded as a recyclable raw material, it becomes a negotiable asset!**

### Site compliance

An environmental department was set up at the beginning of the 1990s. Its main task was to draw up an inventory of the premises on the various sites and analyse their compliance with current national and international regulations. Each time when judged necessary, improvements were made.

At the same time, a study was undertaken to analyse, quantities and methods of managing waste with the aim of reducing costs generally.

As an example, soluble oils used on machine tools consist of 97% water. After it had been used, this oil was collected, transported and incinerated. Today, Leroy-Somer has acquired a machine that separates the oil from the water. Only 3% of waste oil is then left for transportation and incineration! The water resulting from separation can be reused to produce new soluble oil.

### Overall control of environmental impacts

The next stage for Leroy-Somer's environmental team was to measure and prevent environmental impact. Full and systematic analysis was carried out in all sectors involving "input" (raw materials, energy) and "output" (waste, emissions into the air, water and soil, noise pollution). Over the years, the information has been used to establish practical initiatives. Here are a few examples: new burners installed to prevent discharge into the atmosphere of VOCs (volatile organic compounds) emitted by solvents used in paints or impregnated varnishes, recycling of aluminium used in motor casings, 40% of surplus aluminium is now melted down and reused, water consumption reduced tenfold over a period of 5 years, storage areas established for hazardous waste, sites checked prior to acquisition to ensure they are not polluted.

### Establishment of an internal Environmental Management System (EMS)

Conscious of the positive economic outcome of these initiatives, the managers decided in 1999 to systematically incorporate this policy into all the production sites (over 20 large sites) by setting up an Environmental Management System.

Leroy Somer's internal EMS is a transverse structure, aimed to measure and continuously improve each sector. Today, an environmental manager is present at every decision-making level of the company. Their role is to check that current proce-

*Paper crushing*

*Incinerator*

*Evaporator*

dures are being observed and to initiate new projects. These environmental challenges inspire the staff. In addition, this structure has an important role in technologically monitoring and providing information about current developments.

Eventually, this EMS could be certified ISO 14001. For Leroy-Somer, this recognition is not an end in itself, but a logical continuation of an approach that was initiated many years ago.

## What is ISO 14001?

ISO 14000 is the result of ISO's (International Standard Organisation) commitment to support the aim of sustainable development examined at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992.

An Environmental Management System (EMS) is primarily an organisational method. Out of the many organisational reference frameworks describing an EMS, the ISO 14001 standard is the most famous. An EMS that meets the requirements set out in the text of this standard can be certified ISO 14001. A reference framework also means that this is an international standard in force and recognised across the world, whatever the size of the company or its sector of activity. Certification therefore gives the company credibility with the outside world.

ISO 14001 is not a theoretical standard drawn up by experts, but a process of continuous improvement that requires, above all, the company's commitment to going beyond the stage of merely observing current regulations, towards a general approach for reducing environmental impact.

# The Industrial Electronics Division

**The Industrial Electronics Division (D.E.I..), drawing on the experience acquired by Leroy-Somer over decades in electromechanical drive systems, has developed ranges of electronic variable speed drives recognised and appreciated throughout the world.**

Considerable progress in industrial electronics in recent years has meant that variable speed drives, capable of accurately configuring and controlling a machine's most complex movements, have been created. Today 1 in 3 electrical motors are already powered through a variable speed drive and the proportion of electronic drive systems continues to grow.

The D.E.I.. provides a complete, integrated solution for each Leroy-Somer application that is simple to use and entirely adaptable. Synchronising, lifting, positioning, winding or unwinding and shearing to length are common applications in industry, for which the Leroy-Somer variable speed drives have been designed. Capable of communicating with each other by fieldbus, they can control all the movements of a set of machines that have different functions.

Automation needs are changing rapidly because they generate savings and progress. The present trend is to decentralise automation and control. This means that cabinets can be eliminated and wiring simplified. The Varmeca, assembled directly on to the motor, is Leroy-Somer's initial response. The most recent of the D.E.I..'s variable speed drives, the "PROXIDRIVE", resolves all the problems of accessibility or overall size and is able, with no special protection, to run close to the motor owing to its IP66 enhanced protection and sturdiness in hostile atmospheres. Since it does not require a cabinet, it is not subject to EMC interference and overheating problems. This type of product is also aimed at the automotive, agri-foodstuffs and chemical industries.

The expertise of Leroy-Somer's Industrial Electronics Division is not limited to standard, universal products. The D.E.I. designs and manufactures solutions that meet specific needs. This particular

*PROXIDRIVE*


*Lifting*

approach requires close partnership between the client's and Leroy-Somer's technical departments. It actually involves reappraising a machine's drive system to make it more efficient, adding new functionalities to it and making it more competitive. This may involve the removal of certain electrical or mechanical components on the machine, since the functions of these parts are incorporated into the variable speed drive specifically developed for the application. It is here that Leroy-Somer's experience in drive systems and rotating machinery takes on its full meaning. Major players in the industry have already embarked on this original approach, which improves machinery performance, often spectacularly, while reducing manufacturing costs.

Supplying a complete set of enclosed control systems is one of the services provided by the D.E.I... The various components (variable speed drives, contactors, etc.) are cabinet-assembled and wired. Manufactured according to specifications provided by the client, they are supplied ready for operation. These are generally complex control units requiring specific know-how.

Another facet of the D.E.I..'s activities is the design and manufacture of teaching products for training purposes in technical colleges. It involves a bench simulating the movements of machinery generally found in industry.
These benches allow you to familiarise yourself with rotating machinery, electronic variable speed drives, reduction gears as well as make assessments (current, coil resistance, etc.), electronic safety, variable speed drive parameterisation and many other electromechanical or electronic methods.

Industry is demanding ever faster, more efficient, reliable and flexible machinery. The D.E.I.. demonstrates its capacity for innovation and its expertise in industrial electronics by offering products that meet machinery manufacturers' expectations.

*Shearing to length*

*Winding-unwinding*

*Synchronisation*

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# The outdoor life

PROXIDRIVE, Leroy-Somer's new variable speed drive, has been specially designed to run close to the motor in open or closed loop in the harshest atmospheres owing **to its IP66 enhanced protection** and sturdiness. Since **it does not require a cabinet**, it is not subject to EMC interference and overheating problems. It includes twelve preset configurations for the most common applications, making it highly functional.

Finally, if required, the Quick Key, which contains all the parameters programmed into the variable speed drive, makes programming a new PROXIDRIVE easier. The production line can therefore start up immediately!

For further information on our new PROXIDRIVE range, do not hesitate to ask for our technical documentation.

**www.leroy-somer.com**

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