NEWS

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January 2001

Renewable energy

Energy is hitting the headlines again! The rapid rise in the price of crude oil and its immediate repercussions on the population of Europe have put the debate concerning our dependence on fuel and a reduction in fuel consumption right back on the agenda. As far as the European Union is concerned, renewable energy is the way forward if we are to have a future which is not only more stable, but cleaner.

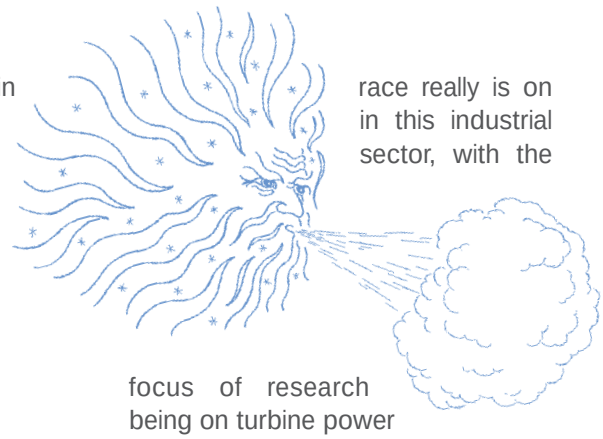
SUSTAINABLE **DEVELOPMENT**

At present, renewable energy represents 6% of total European energy production. In its White Paper published at the end of 1997, the European Commission set an ambitious target of 12% by the year 2010 and recently launched a huge campaign to boost use of this type of energy.

In addition, a "Renewable energy" Directive is being prepared.
Unlike fossil fuel, renewable energy is inexhaustible and does not damage our environment.

Development policies are being set up in a number of countries: at the rural level, making use of local resources (biomass, mini-hydraulics, etc), and space (wind power); and also in urban areas, for example, where biogas from purification plants is being used to run buses, and geothermal science is being used to exploit the heat contained in underground rocks and the water table.

Here is a brief outline of main technologies that are actively being developed.



MAN TAMES THE **ELEMENTS**

Wind

Growing at a rate of 30% per annum, wind farms represent the flagship alternative energy source for the 21st century. Nowadays, they are competitive and by far the most economically viable option, since there is no waste management, no pollution, and no expensive decommissioning involved.

Technological progress in the sphere of aerodynamics, new compounds, regulation and servo-control systems, but also in the storage of energy has led to major advances in the design and appearance of current equipment. The average weight of wind turbines has halved in the last five years, costs are a tenth of what they were ten years ago and annual production of wind turbine energy has increased fourfold. The latest equipment to be installed has an average power rating of 600 kW and machines with a power rating of up to 1.5 MW are already commercially available. Europe is the world leader in production of wind power, and the race really is on in this industrial sector, with the focus of research being on turbine power and noise pollution.

In addition, the installation of wind farms out at sea has enormous potential for the European Union.
In Germany, wind power is playing a pioneering role. Representing 48% of all RE, it is already contributing 4700 MW to the country's electricity generation. Denmark, where RE represents 19% and 1100 MW, is already using wind power for 10% of its electrical consumption.

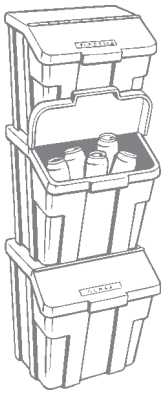
Biomass

Biomass refers to all organic matter coming from diverse biological forms such as those produced by the food processing industry, the farming and timber industries, energy production, organic fraction of solid urban waste and household refuse and even sewage sludge. However, a new community directive has excluded household waste from its definition, to the great satisfaction of the purists.

It constitutes a versatile energy

source, since it can be used to produce electricity, heat or fuel as necessary. It can be stored simply and cheaply (unlike electricity). Moreover, this energy offers innovative opportunities, such as giving forestry sites a new lease of life and new openings for farmers.

The use of biogas (coming for example from the treatment of liquid and solid waste) is also proving particularly advantageous since it contains a high proportion of methane, a gas with a significant greenhouse effect.



Even if the costs of conversion equipment and high levels of investments required are the main barriers to development, biomass has to be an energy worth developing.

Sun

Solar power is characterised as being the only form of energy which can be used directly, requiring no transport, conversion or distribution. Thermal solar power is increasingly used in this market which has now come of age. The production of photo-voltaic solar electricity is itself a cutting edge technology where the production costs remain a major hurdle. This alternative energy source is not currently viable other than for isolated applications with low levels of consumption. In such cases, it can save the cost of connection to the national grid.

Europe occupies a dominant position on the world market and future developments of this type of energy primarily concern building applications. Only a European initiative (integration of photo-voltaic modules in roofs and front elevations) would permit the market to grow and contribute to a substantial reduction in costs. Similarly, this technology could make an important contribution in the electrification of developing countries, where Europe is already well placed.

BOBST - all types of flat and corrugated cardboard

Created by Joseph BOBST (1862-1935) to supply the graphic arts industry, BOBST S.A. has specialised, under the driving force of Henri BOBST (1897-1975), in the development, manufacture, sale and service of machines for printing, forming, folding and gluing flat and corrugated cardboard. The company's lasting success can be attributed to the innovative solutions developed by its engineers.

Many machines have come and gone in the history of BOBST. The Autovariable, one of the first automatic machines for cutting and printing cardboard, was first marketed in 1935. Its considerable success demonstrated the need for this type of equipment in the cardboard industry. The year 1940 witnessed the arrival of the first Autoplatine® press for forming sheets of pre-printed cardboard. This marked the industrialisation of the sector. The first carton gluer, PCR 832, was marketed in 1942.

The new generation of ALPINA carton gluers offer flexibility, ease of operation and high productivity.

Short runs, the increasing complexity of boxes, the precision demanded by automatic wrapping and packaging machines plus the need for increased productivity have had a major influence on the development of these products. BOBST bending and gluing machine enable production of a wide variety of boxes in a number of formats, at speeds of up to 625 m/min and an output of 35,000 boxes/hr.

Each machine exists in several versions and variants depending on the degree of automation and the different types of boxes to be produced, for both flat and corrugated cardboard. The latest technologies are used to ensure that packaging manufacturers can make maximum use of their modular machines. Integrated quality control devices monitor the conformity, uniformity and quality of boxes. Their reliability is appreciated by the industry, and meets stringent requirements.
The productivity of these lines can be further increased by peripheral equipment such as semi-automatic or fully automatic picking devices.

The latest generation of these carton gluers has set a new standard in the industry.

BOBST and LEROY-SOMER

BOBST and LEROY-SOMER have worked together for more than 25 years. The extensive range of LEROY-SOMER's manufacturing programme, linked to the performance offered by its variable speed drive systems, whether open loop, closed loop or servo mode, enable the company to respond to the varied types of drive required on BOBST machines.

Leroy Somer electric motors future-proof against new safety standards for explosive atmospheres

In three years time the European Union ATEX Directive will introduce higher standards of protection for electric motors used in explosive atmospheres. Leroy Somer's FLSD, FLSN, FLSPX and LSPX ranges have been designed to satisfy the requirements of this Directive, enabling operators of installations with hazardous environments to meet tomorrow's safety standards today.

The European Union's ATEX Directive 94/9/EC, "Protective devices and systems designed for use in explosive atmospheres", lays down new standards of protection for equipment used in atmospheres where the presence of dust or gas presents a risk of explosion.

It must be implemented by all EU member states on 1 July 2003 and will apply to existing as well as new installations.

Installing the appropriate motor from Leroy Somer's extensive hazardous areas range enables operators of installations with potentially explosive atmospheres to prepare for this Directive.

The ATEX Directive will introduce statutory minimum standards across the EU for the first time, though individual member states will still be able to introduce national standards that go beyond the Directive.

The ATEX Directive requires operators of hazardous installations to carry out a risk assessment and classify areas where there is a risk of explosion into three zones.

Equipment, including electric motors, is categorised according to its level of protection against becoming a source of ignition, and the ATEX Directive specifies which category of equipment may be used in each zone.
Equipment designed and constructed to comply with the Directive must be CE marked and carry a special mark consisting of the Greek letters "Ex" enclosed in a hexagon.

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APPLICATIONS

Depending on the category, either the manufacturer or a third party authority has to certify that the product meets the necessary standard.

Zone 20 and Zone 0 are areas where there are combustible dust or gas clouds respectively, frequently or permanently. Only Category 1 equipment is permitted in Zones 20 and 0, and no electric motors can be used in these zones.

Zone 21 and Zone 1 are areas where, during normal operation, the atmosphere very occasionally consists of combustible dust or gas clouds respectively.

Equipment in these areas must meet or exceed the requirements of Category 2. Category 2 motors must be CE marked and a certificate of conformity issued by a certified authority.

Motors for use in Zone 21 must additionally be rated IP6x and the surface temperature cannot exceed 125°C, the lowest temperature at which a cloud of wheat or other cereal crop dust could ignite.

Leroy Somer's new LSPX and FLSPX ranges comply with all the requirements for use in Zone 21. They are rated IP65, the highest for protection against ingress of dust, the surface temperature is guaranteed not to exceed 125°C and they are third party certified by INERIS.

These motors are painted orange to distinguish them from conventional non-Ex motors.

Leroy Somer's flameproof FLSD range is suitable for use in Zone 1.

To ensure the motor surface temperature never reaches a level that could ignite a gas cloud, thermal probes are incorporated into the coils and/or endshields of the motors. These are then connected to a thermal protection device that shuts off the motor if the temperature rises above a pre-set limit.

Zones 22 and 2 cover areas where the atmosphere either does not consist of combustible dust or gas clouds or only consists of such clouds for a very short duration.

Motors in this zone must be Category 3 equipment and CE marked, though the manufacturer is allowed to self-certify compliance with these specifications and no third party certification is required.

Motors for use in Zone 22 must be rated IP5x and the surface temperature must not exceed 125°C.

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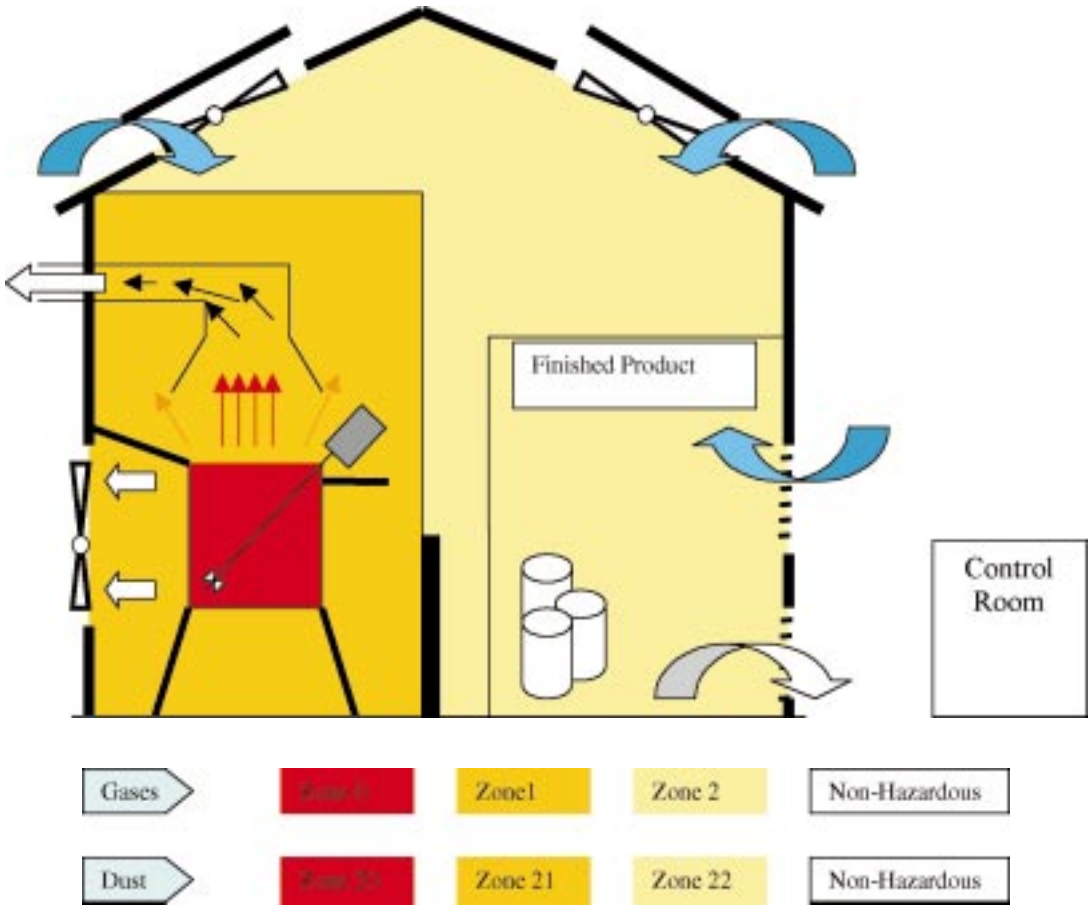
TYPICAL ZONE ASSESMENT



LEROY SOMER PRODUCTS FOR HAZARDOUS AREAS

Zone	0	20	1	21	2	22	Non Hazardous
LS Motors	NOT Allowed	NOT Allowed	FLSD	FLSPX	FLSN	FLS/LS silo option	LS PLS FLS
LS Brake Motors				LSPX FAP		LS FAP Silo option	LS FAP LS FCR
LS Gear units				CB2000 MB2000 OT2000		CB2000 MB2000 OT2000	CB2000 MB2000 OT2000

The Leroy-Somer LS and FLS ranges can be installed in Zone 22 when used with the SILO option. Built to this specification they are rated IP55 and maximum surface temperature does not exceed 125°C.

The FLSN non-sparking range is suitable for use in Zone 2. These motors are designed so that the temperature at any point, including the rotor, cannot exceed set limits under any operating conditions, and these limits are shown on the conformity certificate and the nameplate.

FLSD, FLSN, FLSPX and LSPX motors are available in a range of frame sizes with a variety of options including variable or dual speed and FAP brakes.

With the Leroy Somer ranges of explosion-proof motors operators and OEMs can future-proof installations with explosive atmospheres against impending legislation. Specifying ATEX-compliant motors between now and 2003 will ensure that equipment does not have to be replaced to comply with the regulations when they come into force.

Leroy Somer motors helps Truvox to a clean sweep

When rotary floor cleaning machine manufacturer Truvox was developing its new Orbis range, the company turned to Leroy-Somer for the heart of the machine - the motor.

The Truvox Orbis single-disc rotary machine represents a technical breakthrough in hard floor cleaning.

Designed entirely on the 3-D CAD system Pro Engineer, the Orbis is simple, robust and more economical to buy and operate than any previous generations of similar equipment.

Truvox Design and Development team leader Pete Ward explains.

"When we set out to develop the new Orbis we wanted an economical unit that would still retain the quality of our existing machines," he says. "Our strategy was on two fronts - the machine body and the motor."

The first major change made for the Orbis was to move away from die-cast aluminium castings.

Instead, the new model uses high quality plastic injection mouldings that provide rugged protection for the motor and are easy to clean.

But the motor is the single most expensive item in a rotary cleaner, and Truvox challenged Leroy Somer to develop a more cost effective yet powerful unit.
"We use Leroy Somer motors in our other machines, and they have always proved extremely reliable," says Mr Ward. "But in the past we have always used enclosed motors with a fan on top and a casing around the rotor and stator. This was unnecessary, as we always put a case around the motor anyway."

Leroy Somer's solution was to develop a new 1.1kW motor with an open frame, which improved cooling, efficiency and power output while reducing the cost by one third.

Simon Dodd is Leroy Somer's regional sales manager.

"Truvox were looking for maximum power from a motor that had to be flat and compact to reduce weight and improve the aesthetics," he says. "We discussed the customer's requirements with our factory engineers and they came up with a unit to meet their needs."

The Orbis motor is based on a similar design to those developed for use in lawnmowers, a market in which Leroy Somer has considerable experience of volume production, and Truvox was able to share the cost advantages of these economies of scale.

"The decision to adopt an open frame construction was made, to retain the efficiencies of cooling and increased power from a compact motor," says Mr Dodd. "Leroy Somer specialises in adapting standard products for individual customers, and we were able to come up with suggestions and ideas on shaft length and motor mountings to suit Truvox's application."

Truvox and Leroy Somer worked together to select the optimum "vibration tuned" rubber mountings to minimise the transmission of vibration from the motor to the machine body. "To optimise the mountings we used Leroy Somer's extensive test facilities to try the machine with a range of mountings," says Mr Ward. "Together we were able to determine which rubber mountings produced the minimum vibration."

A 3-D Pro Engineer CAD drawing of the motor was supplied by Leroy Somer to Truvox to enable the rest of the machine to be designed entirely in CAD around the motor.

There are three models in the new Orbis range: an 187 RPM machine for scrubbing and other tough cleaning jobs; a 400 RPM machine for polishing; a twin speed 187 or 400 RPM dual purpose machine.

The 187 RPM machine uses a 4-pole 230V motor turning at 1500 RPM, with a system of pulleys and belts to reduce the speed of the cleaning disc.
The 400 RPM machine uses a two pole 230V motor turning at 3000 RPM, again with a pulley and belt system reducing the speed.

The dual speed model uses a pole-change motor with four poles that can be switched to use only two in high speed polishing mode.

A 110V version for the US market is currently under development.

By combining their long experience in this field Leroy-Somer and Truvox developed a new approach to rotary cleaning, and the new Orbis offers higher standards of design, construction and durability, at lower cost than previous models.

From Aqaba to Amman : a royal path steeped in history and nature

Viewed from space, the Gulf of Aqaba appears as a glistening blue gash across the north-east of the African desert. Viewed from the seabed, it offers the spectacle of an almost unreal world where aquatic flora and fauna come together in a fairy-land of colours. Viewed from dry land, the King's Road conveys us to one of the most beautiful spots Jordan has to offer.

The Northern Gulf of the Red Sea, Aqaba is situated between the peninsula of Sinai and Saudi Arabia, where the Dead Sea peters out. Narrow, but 200 km long, the Gulf opens out onto the territory of Jordan and Israel.

The deep waters of this inland sea known as the Red Sea can reach 30°C. Due to the volcanic activity in its shallow waters and the regular currents which travel North in winter and South in summer, the Gulf of Aqaba enjoys an exceptionally pleasant climate of 20°C in the middle of winter, while Amman can only manage 5°C. The seductive inspiration of this arid, mountainous terrain scored with canyons bordering the Gulf, its immense fine sandy beach and crystalline waters make it a real beauty spot of major ecological importance.

Its flourishing underwater life, the clear waters with their intense blue colouring and the incessant to-and-fro of thousands of fish offer an absolute paradise for divers, and provide exceptional conditions for underwater photography. More than 400 types of coral have been identified in this unique ecosystem and 20% of the world's endemic fish species have been recorded there. Spectacular and colourful, the stingray, flying scorpion fish, clown-fish, angel fish, lemon fish, butterfly fish and lion fish are some of the happy beneficiaries.

The King's Road, leading from the plateaux of Aqaba to Amman, is a thrilling voyage of discovery for both eyes and spirit. This is probably the route taken by the Queen of Sheba with her camels laden with aromatic spices, gold and precious stones on her way to Jerusalem, drawn by Solomon's reputation for wisdom.

A veritable unfolding of the pages of history for the peoples of the Ancient East, Arabia and the Crusades, it takes you through the most beautiful landscape in Jordan. On this royal path: the city of Petra with its pinky red colour, where earthquakes, running water, gales and rain have fashioned over time one of the most beautiful geological architectures. With spectacular deep gorges, majestic intertwined crags, pastel rocks, outcrops and peaks in red, mauve, yellow, green and blue sandstone, it is a wondrous city, and has been declared the Unesco world heritage site.

The fractional horse-power (FHP) division of Leroy-Somer

A long tradition of fractional horsepower lies behind the factory at Saint Symphorien d'Ozon, which has since become the pilot plant of Leroy-Somer's fractional horse-power division. Nowadays, this division has developed a unique area of expertise, recognised by leading manufacturers worldwide: the design and manufacture of 'universal' purpose motors, suitable for the international market.

Central unit and satellite factories

In 1947, Albert Jean Bertin founded the Rhône Mechanical and Electrical Engineering Company (SOMER) in the centre of Lyons (France), at Lyons Perrache to be exact. Sixteen years later, the company moved to its present location, at Saint Symphorien d'Ozon in the suburbs of Lyons. And in 1967 the LEROY company (Angoulême), established by Marcellin Leroy in 1919 and the SOMER company (Lyons) merged to form the current company. This date also marked the starting point for numerous acquisitions and joint ventures including the SAMOV plants in 1973.

By the early 90s, Leroy-Somer had become an industrial power of international standing, owning 34 factories. The company underwent a major reorganisation, which created 5 industrial divisions. Within each division, there is a central unit which undertakes the major functions (research, development, process, marketing, sales, management and production), and satellite factories. Benefiting from modern high-performance technology, these satellites are able to devote themselves totally to their production function.

The FHP division

In 1991, the factory at Saint Symphorien d'Ozon became the central unit of the FHP (Fractional Horse Power) division and is responsible for the design, manufacturing and marketing of drive systems with power ratings of less than 1 kW. The division now consists of 7 decentralised satellite factories, including a high tech aluminium pressure casting foundry with production of 10 tonnes per day.
Every day, 6000 products leave the factories of the FHP division, with over 50% destined for export, including 15% for Germany. The split is as follows: induction motors (75%), geared motors (13%) and DC motors (12%).

In recent years, the various divisions of the Leroy-Somer group have worked in parallel, running major campaigns to harmonise production tools and offer more coherent product ranges. Hence, the various design offices have improved component compatibility, product versatility, and harmonisation of the FHP and IHP (Integral Horse Power) ranges, etc.

Tailor-made products and the concept of "solution selling"

The strong point of the FHP division is undoubtedly its offer of tailor-made products for leading international manufacturers. In this field, the company has specialised in 3 segments of the fractional horsepower sector: industrial applications (materials handling, supply, help with mobility, etc), HVAC (Heating Ventilation & Air Conditioning) and pumps and compressors (no-load pumps, high-pressure pumps, pumps for swimming pools, etc).
In an international market where expertise and competitiveness are essential, Saint Symphorien d'Ozon has developed a unique concept of 'solution selling'. Christian Pin, Sales & Marketing Manager, explains the principles of this concept: "For tailor-made products, we target typical fractional power markets whose needs correspond to our expertise. The cornerstone of this concept is our design office, consisting of engineers with specialist skills in the design of mechanical, electrical, ventilation, and electronic equipment and gear mechanisms, which is therefore capable of meeting the most exacting demands. Secondly, it is essential in today's market to reduce product development time, given that their life cycle is increasingly short. The third element is our expertise in designing and manufacturing "universal" products, suitable for the international market. Fourthly, production lines are installed in such a way as to simplify assembly of components required by the customer. Finally, the factories use 'just in time' methods, and can integrate the customer's forecast requirements or respond instantly to more 'ad hoc' orders".

Variable speed products: the future of Saint Symphorien d'Ozon

An irreversible change is taking place in drive technology. Thus more and more motors are incorporating or being used in conjunction with electronic technology.

At present, frequency inverters or variable speed drives, motors with variable reluctance and synchronous motors with magnets are the main focus of this evolution.

At the Saint Symphorien d'Ozon factory, the future is happening today!

NO-LOAD PUMPS : **A UNIVERSAL CONCEPT FOR AN INTERNATIONAL MARKET**

One of the major success stories at Saint Symphorien d'Ozon, highly appreciated by international experts, is the development of motors for no-load pumps. Multivoltage and multifrequency, this universal concept of single-phase motors meets the criteria for use anywhere in the world. These motors also have high torque capacity on starting and are extremely compact (developed by Leroy-Somer from a voltage relay and a special winding in order to reduce the size of the capacitor). In addition, if the customer wishes, control modules (relays, capacitors, etc) or power modules (electronic components) can be associated with or integrated in the motor.

A **READY-TO-USE** PRODUCT **FOR HELP WITH REDUCED MOBILITY**

Leroy-Somer has designed a drive system based on a low-voltage 12 V or 24 V DC motor associated with a gearbox and a differential, a failsafe brake with manual release and 2 axles for direct mounting on the wheels.

The customer thus has a product which is ready for immediate use and can concentrate on his own business.

THE **AMCA** VENTILATION LAB

For many years, Leroy-Somer has worked with its customers to optimise motor/fan torque. In the field of ventilation, the motor is cooled directly by the fan it is driving.

The AMCA enclosure is used to represent motorised fans with an output of up to 30,000 m^3/hr, equivalent to an axial fan with a diameter of 900 mm, in terms of ventilation (flow-pressure curve) and acoustics. It can also be used to simulate the actual motor load in order to optimise the motor size.

Editor in chief :
Jean-Michel Lerouge
Leroy-Somer
Bld Marcellin Leroy
F-16015 Angoulême

Co-ordination and layout :
Im'Act

Editorial committee :
Fr. Galais, A. Galloway, P. Hellstrand, R. Lamprecht, J. Laureys, O. Powis, A. Rostain, G. T. Sørensen, V. Viccaro.

Leroy Somer Ltd
Heathrow Interchange
Bullsbrook Road
Hayes - Middlesex - UB4 0JR
leroysomer@leroysomer.co.uk
Tel: 020 8756 7000
Fax: 020 8756 7028

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Leroy-Somer Ltd • Heathrow Interchange • Bullsbrook Rd • Hayes • Middlesex • UB4 0JR
Tel : +44 020 8756 7010 • Fax : +44 020 8756 7028 • Email : leroysomer@leroysomer.co.uk

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