

Dear Readers,

New ideas and inventions are the driving force of most economies. This paraphrase from the famous economist and Nobel prize winner, Robert Solow, can also be applied to a medium-sized company.

Only by continuous efforts in the further development of its own products as well as redesigning those products to make them more efficient and economical can a company sustain its long-term future. Focussing efforts on the improvement of a product will lead to deserved attention.

A dynamic atmosphere in innovative companies attracts good employees. Such an atmosphere motivates and inspires employee participation.

Based on this company philosophy we have enhanced our equipment over the years. Our success has proved us right. Many of our customers have benefited from SLF's surface treatment technology and have come to appreciate it.

An example is our media blast robot ReCo-Blaster® that has already demonstrated its effectiveness.

The dark radiator technology "DARC" (Dark Radiation Convection) developed by us represents a revolution in the enamelling process of powder coated components. Even on work pieces with different sheet metal thicknesses (from 3 to 100 mm) the powder is precisely burned-in whilst maintaining a high quality finish.

We believe the ability to maintain innovation over generations, and call upon it again and again from our employees, will lead to our company's success and business development in the long-term.



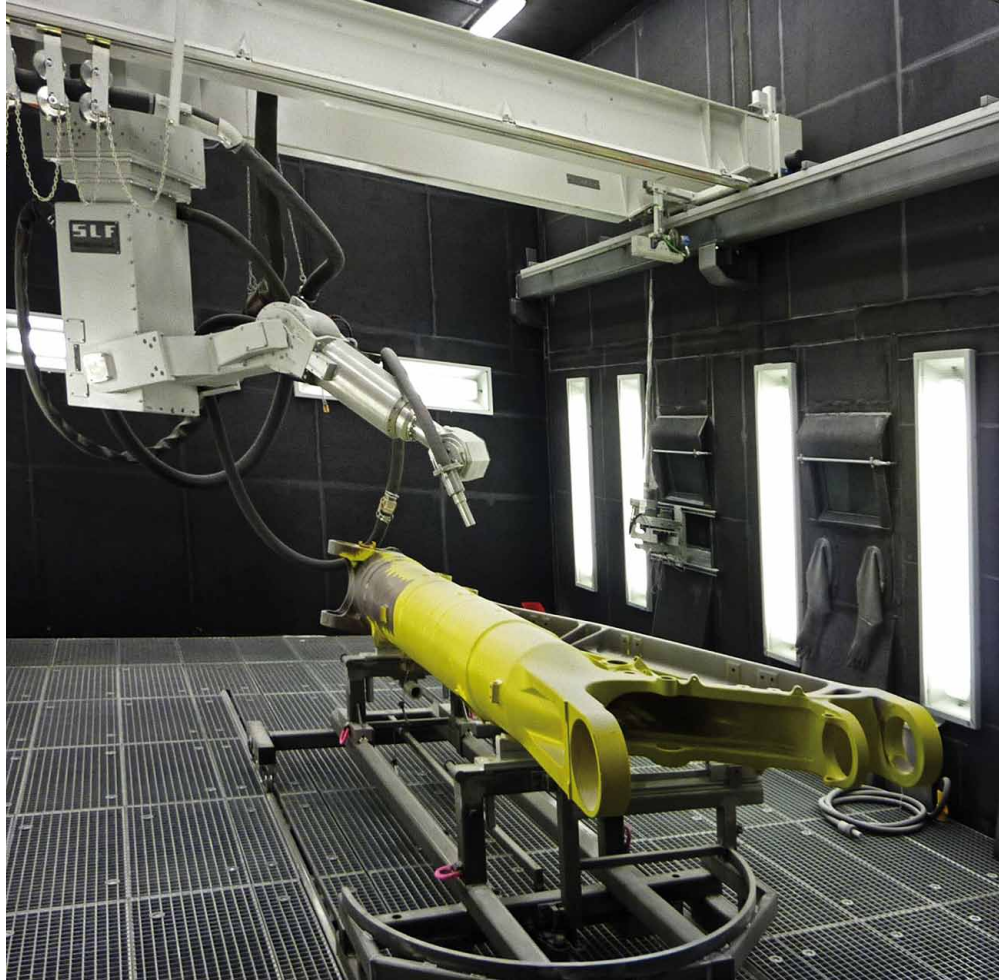
Fritz Gaidies and Michael Bahlinghorst

For this reason, after the retirement of our former managing partner Heinz-Georg Vollmer, the technical responsibility of our company was transferred to Mr. Michael Bahlinghorst. He has worked in a leading position in our company for many years and since the beginning of this year has become a member of the management partner team. Together with the managing partner Fritz Gaidies he now controls the affairs of our company.

Best Regards

F. Gaidies *M. Bahlinghorst*
 Fritz Gaidies Michael Bahlinghorst

Surface preparation at Lufthansa Technik AG and LMB with the new media blast robot ReCo-Blaster®



Blastroom with media blast robot ReCo-Blaster®

In the course of regular checks, aircraft landing gear is subject to crack detection. For this purpose they are completely disassembled and the paint is removed by blasting.

For this paint stripping process, SLF's blasting robot ReCo-Blaster® has recently been commissioned at **Lufthansa Technik AG** in Hamburg.

Previously the landing gear components were prepared by use of a manual blasting cabinet.

During this process the operator stood outside the cabin and fed the blast nozzle, which was fixed to a lance with a length of up to 2 m, through arm holes towards the

work piece, i.e. a laborious and exhausting working process, especially for complex work pieces.

The manual blasting cabinet is now obsolete!

Blasting of work pieces is now performed fully automatically by the ReCo-Blaster® developed by us! The robot not only replaces the laborious manual operation, but also makes it possible to reproduce the blasting process once it has been programmed by means of the "Teach-In-Mode". Therefore, the ReCo-Blaster® is an economically viable and worthwhile investment, particularly for parts treated in series.

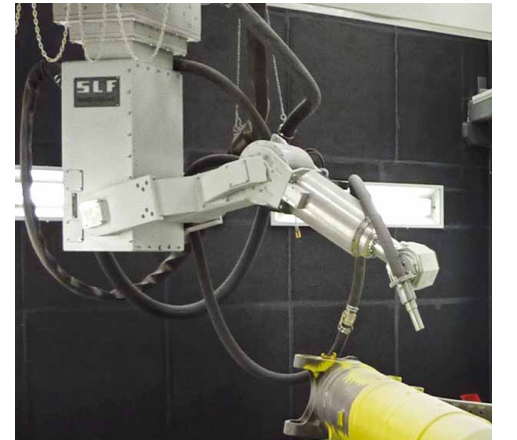
The use of a twin-chamber pressure blast pot allows continuous blasting without interruption. During the blasting process, blast pressure and media flow are automatically adjusted and controlled.

The ReCo-Blaster® fully automatically blasts the outer surface of the work pieces with a 19 mm sized blast nozzle. The inner side is tackled with an up to 2.5 m long blasting lance that can be attached to the robot arm.

Eight axes ensure an optimal free movement of the robot. In order to minimize wear on the robot, its shoulder and wrist actuators, as well as the supply cable of the robot arm, are integrated in the robot housing. Double sealing protects the vertical axis against abrasive and dust.

Operation of the robot and programming of work piece parameters is performed by means of two joysticks. As the joysticks are fixed to a moveable control panel, programming of the robot movements (without abrasive) is possible **inside** the blastroom or **from outside** via a viewing window.

Teaching from the outside can also be performed during the running blasting process. The robot control which is used in connection with the joysticks allows for very easy programming of the sequence of movements.



Robot arm

Compared to a conventional multi-axis control, the operator does not have to control the movement of the individual axes, but only the shifting and position of the blast nozzle in relation to the work piece.

Another example is at a large steel component preparation company **Logaer Maschinenbau GmbH** in Leer, Germany where a ReCo-Blaster® will soon be used for blasting prior to the paint spraying process.

By acquiring a ReCo-Blaster® our customers have taken into consideration all aspects of profitability, ergonomics and automation with an optimal occupational health and safety aspect. The result is a consistent, reproducible blasting quality due to the automatic control of the variable parameters.



Exterior view of a blastroom with ReCo-Blaster®

DARC® – a technique for quickest results in enamelling powder coatings

Writing "DARC®" is not a typing error; it stands for **Dark Radiation Convection**, a new development by SLF, namely a combination of long-wave infrared radiation (dark radiation) and recirculating air.

Using DARC® technology brings about significant advantages compared with a circulating air oven:

- heating-up time for work pieces is reduced by up to 80%, and as a result there is
- up to 75% space-saving,
- up to 15% energy saving and a
- higher process reliability (no mixing-up of colours)

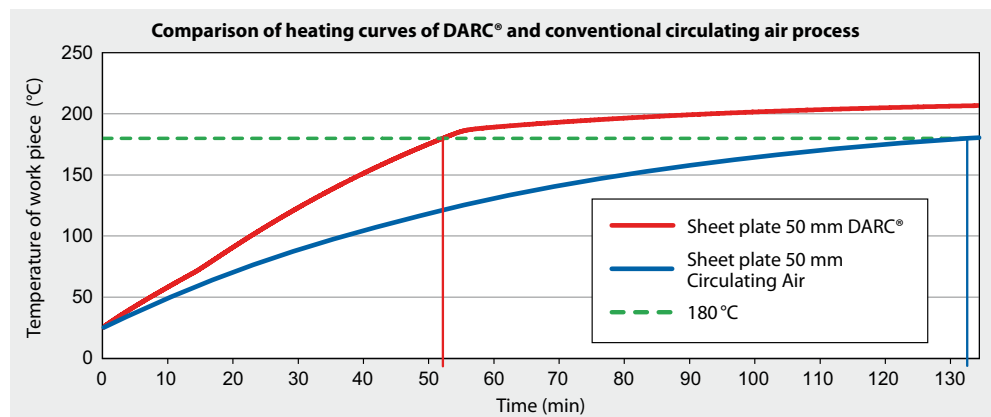
The interior wall of the DARC® enamelling furnace is used as an infrared radiator. By means of ventilators inside the walls of the furnace, hot gas is directed in a circular flow over a burner. A uniform distribution of the heat radiation on the work piece is ensured. Only after the powder has started gelling is convection activated. The convective flow runs downwards along the side walls, encounters the opposite flow on the floor and then moves vertically upwards to

the ceiling, where it is extracted again. In this case the side walls and the floor act as heat exchangers.

Experience gained with DARC® technology shows that it is not only perfectly suitable for enamelling powder coatings on thick-walled work pieces, but also for quick enamelling on work pieces with different wall thicknesses.

Typically, the warm-up time needed to reach the necessary object temperature of 180°C in a circulating air oven for a test element with different wall thicknesses ranging between 2 and 50 mm was 133 minutes. Using DARC® technology the warm-up time was considerably reduced, in this case to only 52 minutes.

DARC® technology is economical to use for enamel powder coatings as well as for drying wet coatings and cathoretic painting on elements with a minimum wall thickness of approximately 20 mm. Typically this applies to cast iron parts or welded constructions. However, differences in the thickness of the walls ranging from 2-50 mm and more are no obstacle to using DARC® technology.



Comparing heating curves shows the gain in time with DARC® technology.



High-quality materials, easy-to-maintain components and an ideally matched modular design – these are the features of the SLF water treatment system.

A matter of cleanliness

In order to optimize processes and increase the quality of coatings we have installed a cleaning cabin at **MFD Hegenscheidt GmbH & Co. KG**, Erkelenz, Germany. The cabin manually degreases work pieces by means of a high-pressure cleaner. It has been installed close to the paint spraying cabin which we already delivered in 2007.

The centre piece of this cleaning cabin is the water treatment system developed by us which has been designed for the recirculation of the cleaning agent, thereby essentially reducing the consumption of cleaning agent. The treatment system is a modular and matched to the process system consisting of a 3-chamber stain-

less steel tank as well as a belt filter for pre-separation:

- Sedimentation chamber
- Settling chamber
- Storage basin for the cleaning agent

The insulated 3-chamber stainless steel tank has a capacity of approx. 2.5 m³ for process water. A level regulator automatically refills the water and cleaning agent. By means of an electric heating unit water temperature is kept at 80°C.

The cleaning cabin has a size of 5 x 6 x 6 m (L x W x H) and is lined with stainless steel. The illumination level is 1,000 Lux and the ventilation system has an 80-fold air exchange both of which are important quality criteria.

More automatic blasting systems for ZF

SLF has developed a new automatic indexing table blasting system with direct pressure system for **ZF Friedrichshafen AG** allowing fully automatic blasting of pinion carriers for vehicle gears.

The automatic blasting system consists of the following main components: blast cabinet, indexing table, mechanical media conveying system, direct pressure blasting system and extensive peripherals such as a dust collector with fire detection system, a separate air blowing cabinet, a sound absorbing cabinet, a loading/unloading robot and an infeed and outfeed conveyor belt.

By means of four blast nozzles the area between the parallel flanges of the pinion

carriers is blasted in order to remove scales and loosely adhering welding beads. When doing so the nozzles are automatically moved over a vertical servo axis.

Afterwards the residual stress of some work pieces is increased by shot peening with two nozzles that are vertically directed at the spline and the cross hole of the shaft. In order to achieve consistent blasting results all parameters are continuously monitored and controlled.

After the blasting process a handling robot grips the work pieces, holds them in a separate air blowing cabinet for the removal of blasting media residue and then lays them on the outfeed conveyor belt.



Pressure blast indexing table unit with automatic loading and unloading



Automatic indexing table unit with direct suction system

Additional automatic blasting system with suction blast system for synchroniser rings

The growth rates in the production of synchroniser rings at ZF also required another automatic suction blasting system. Due to their positive experience of a system supplied by us in the past the gear manufacturer once again chose our blasting technology.

Equipment of the same design as one already supplied system was chosen and had to be integrated into an automatic

coating line. Due to the wide range of products produced by ZF there was an additional requirement of nozzle oscillation for optimum blasting of work pieces with different heights.

In order to achieve consistent quality results, this equipment has also been provided with a blasting pressure and media flow controller.

This has shown once more that a good product and good service can help winning customers' loyalty.

We get you moving

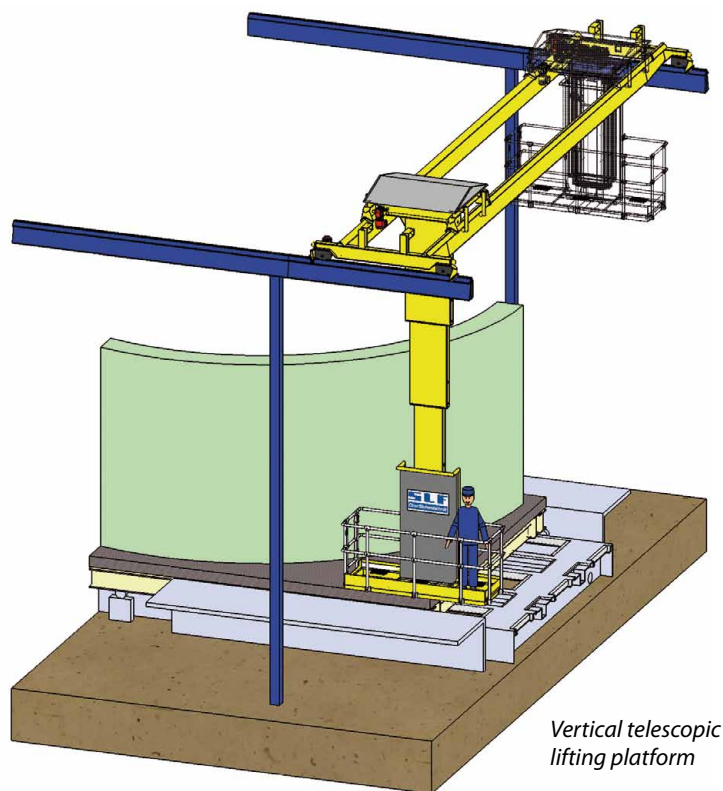
For being able to treat the entire surface of large work pieces in blastrooms or paint spraying cabins, personnel lifting platforms are often used. In order to withstand the aggressive operating conditions inside such cabins, we have developed very robust swivelling and scissors-type lifting platforms. The lifting platforms do not require obstructive floor rails, but are moved on rails which are attached to the walls of the cabins. For operating in blastrooms, the lifting platforms are lined with wear-resistant protective rubber,

whereas the lifting platforms operated in paint spraying cabins are provided with spark resistant (Ex) equipment.

Following the trend to deliver ever larger blasting and paint spraying systems, we took this opportunity to develop another type of lifting platform. Our new vertical telescopic lifting platform offers the utmost in flexibility and ergonomics.

The upper travelling axis is similar to a bridge crane with two carriers. On the crab, which travels on the crane bridge, a vertically extending telescopic mechanism is installed. The platform cage is attached to the lower end of the telescopic mechanism.

This working platform allows not only access to very large work pieces, but also components with open top surfaces such as containers or railway cars.



Vertical telescopic lifting platform

A heavyweight counts on innovative cabin technique

Beckmann Volmer Konstruktions-technik GmbH in Salzbergen, Lower Saxony, Germany, leading manufacturer of components for the wind energy and rail vehicle sector is growing and growing. This dynamic development required adjustments to production capacity as well as to the paint spraying technology.

During planning of the SLF paint spraying system, optimum material transport with maximum flexibility as well as cost-effective operation of the machine were paramount criteria. At the end of 2011 two side-by-side combined paint spraying and

drying cabins with a size of 16 x 9 x 5.5 m were commissioned.

Maximum flexibility due to the Twin-Cabin-Concept!

Loading in the cabins can be performed by a forklift or for heavy work pieces with a weight of up to 80 t by a bridge or gantry crane. For this procedure, the roof and the face side of the cabins can be completely moved to the side so that the gantry crane can place the work piece in the paint spraying area at any position and without any further problems. Thus on one paint spraying

area work pieces can be coated or dried whereas on the other paint spraying area, loading and unloading can be performed. Simultaneous paint spraying in both areas is also possible. Therefore, the design of the system, optimally adapted to the production conditions, ensures high flexibility with short through-put times.



Loading of the twin cabin by using the bridge crane



Group photo with visitors from South America

Latin America meets SLF

That was a great day with some very interesting highlights, was the opinion of almost 200 South and Central American employers, who had come to Germany in order to find out about the SLF paint spraying and airblast systems. During an all-day informative event the employers, mainly from the steel construction sector, had the opportunity to take a closer look at the current possibilities offered by a system design that is optimally adapted to their purposes.

Early in the morning the guests, in three different groups, viewed the surface treatment centre we supplied to JÖST company in Dülmen, consisting of a blastroom and paint spraying systems. The visitors took every opportunity to ask the operator about his experiences in using SLF technology.

During the following evening event the guests could gather detailed information about our special system designs and the day ended with a dinner and an informal get-together with interesting conversations.



Blastroom for rail vehicles

Rail vehicle sector goes in for SLF

For many years now we are proud to say we have delivered blasting, paint spraying and conveying systems especially designed for the railway vehicle sector. Companies such as Siemens, Bombardier and Deutsche Bahn (German Railway) have all benefited from our products. Meanwhile our technology is successfully used far beyond the German borders. For example in various factories in China, passenger trains are treated in blastrooms which have been delivered and assembled by us.

The current "highlight" in this sector is a contract worth millions placed by our customer **Siemens Österreich AG** (Siemens Austria) in Vienna. Here we are

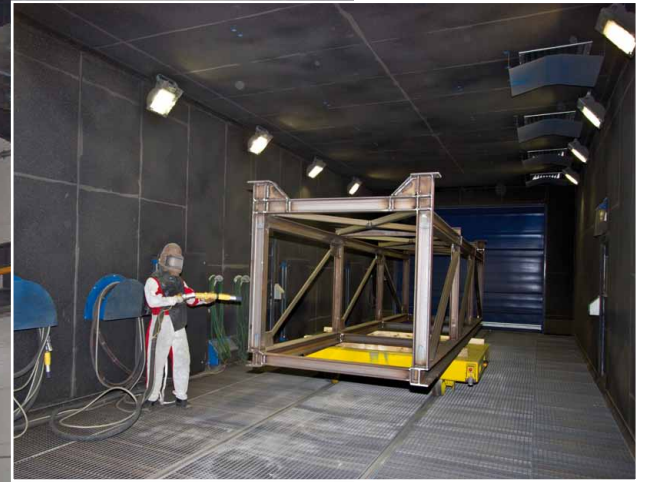
currently assembling a surface treatment centre equipped with an automatic transportation system. It consists of 17 preparation, paint spraying and drying cabins as well as one blastroom. For the first time in Europe, rail vehicles are coated fully automatically in such cabins. Another large order was placed by the **Deutsche Bahn AG** for their factory in Krefeld. As general contractor we are contracted to erect a complete coating line consisting of seven processing stations. Compliance with specific building regulations in a factory building listed for preservation is, in this case, a special challenge for us.

++ SLF Operators' Experience Exchange Meeting ++

In March 2011 we invited our customers to attend the 1st Operators' meeting to exchange their experiences. Numerous users from different companies came in order to discuss the topics of blasting, paint spraying and conveying. Due to the positive feedback further events for the experience exchange are envisaged.



The most effective usage of open-space paint spraying systems: combination with a moveable telescopic dryer



Blastroom fully equipped with gratings including circulating air operation for large components

SLF + AGTOS: Perfect surfaces for steel structures

T rue to the motto "Blasting and paint spraying systems from one source" SLF and its sister company AGTOS have delivered a surface treatment centre consisting of a blastroom, a roller conveyor shot blasting plant and a paint spraying and drying system for the steel company **Schone & Bruns** in Meppen, Germany.

Effective manual blasting

In the blastroom that we supplied, work pieces with a length of up to 15 m, a cross section of up to 3 x 3 m and a weight of up to 24 t can be treated. During the blasting process two simultaneously working operators can manually treat the work pieces to be blasted. The lamella-type conveying floor collects all the abrasive.

A spaciouly dimensioned cartridge filter unit ensures optimum viewing conditions within the blastroom.

By means of the installed air circulating arrangement the system can be operated economically without an additional heating unit.

Automatic blasting in a continuous process

The AGTOS roller conveyor shot blasting plant is designed for structures and other work pieces up to 2.6 m in width, 1.4 m in height and 15 m in length. To ensure that the blasting only takes place when work pieces are in the blasting chamber, a signal threshold is activated in front of the blast chamber. The blast chamber is made of a highly wear-resistant manganese steel and equipped with eight high performance turbines each with an output of 18.5 kW. Their configuration and position ensure that all work pieces are reliably cleaned at a passage speed of 0.4 to 1.5 m/min. After passing the blasting zone the work pieces

arrive via the outlet sluice at the blower unit, where they are cleaned of blasting dust. The abrasive that is collected here and in the blast chamber is purified and recycled into the abrasive circuit.

Paint spraying and drying on one area

For the following paint spraying process two SLF open-space paint spraying systems with a size of 15 x 8 m each in combination with a moveable and telescopic dryer have been installed. Particularly for large and heavy work pieces, this system offers great advantages with regard to an optimum flexibility and profitability.

The technology features a sectionally divided, very energy-efficient ventilation system with long-range nozzles which are fixed to the hall ceiling. The control of the individual sections is performed by means of the operator's recognition system developed by us. In order to improve the ener-

gy balance of the system, a heat recovery system with a degree of efficiency of more than 60% has been installed. During breaks in paint spraying, an energy saver circuit reduces the air capacity by 50%.

After the paint spraying process, the freshly painted work pieces remain in the paint spraying area for the drying process. For this procedure the moveable telescopic dryer travels over the work piece. After closing the roll-up doors on the face side, the work pieces are dried in circulating air operation at 80 °C.

This technology allows space-savings of approx. 40% compared with a conventional cabin design.

As no obstructive walls are required, the operator has more flexibility with regard to the transport of the work pieces as loading and unloading of the paint spraying area can be performed almost exclusively by the existing bridge cranes in the hall.



AGTOS roller conveyor shot blasting plant

Range of products

Airblast and pre-treatment systems

- Blastrooms
- Blasting robot ReCo-Blaster®
- Blast cabinets with direct pressure systems / Automatic blasting machines
- (Telescopic) High-pressure cleaning cabins

Paint spraying systems

- Open-space paint spraying systems
- (Telescopic) Paint spraying cabins
- (Telescopic) Dryers
- Powder coating systems

Conveyor technique

- Lifting platforms
- Hanger-type conveyor systems
- Roller conveyor systems
- Rail cars

Service & Spare Parts

IMPRINT

SLF Oberflächentechnik GmbH Factory Greven

Grevener Landstr. 22 – 24
D-48268 Greven (OT Reckenfeld)
Germany

Phone: +49(0)2575 97193-0
Fax: +49(0)2575 97193-19
info@slf.eu · www.slf.eu

Factory Mühlau

Waldstr. 8
D-09241 Mühlau near Chemnitz
Germany

Phone: +49(0)3722 6071-0
Fax: +49(0)3722 6071-20
post@slf.eu · www.slf.eu

You are welcome to visit our website www.slf.eu