

PRESS RELEASE

„We Think Laser“

ROFIN presents the broadest product portfolio of industrial lasers for material processing as well as demonstration of a number of new lasers and systems.

Hamburg (RS), June 2001 - At the LASER 2001 in München, June, 18th -22nd, 2001, the ROFIN-group shows its products in booth 241 located in hall B3 under its new M³ organization structure: Macro, Micro und Marking.

The ROFIN-Group brings well established laser companies like Rofin-Sinar, Baasel Lasertech, Dilas Diodenlaser and Wegmann-Baasel under one roof. Its comprehensive product spectrum is shown as a whole for the first time, and includes CO₂-lasers with a wide range of output powers using different design principles, lamp and diode pumped solid state lasers, which operate in pulsed and cw mode, and diode lasers for direct material processing. In addition to laser sources various systems are presented.

The Laser Macro Group - The Power of Light

The ROFIN Laser Macro Group is focused on laser sources and laser based systems for industrial applications, using high power CO₂-, diode and solid state lasers for cutting, welding and surface treatment applications.

The first product highlight is the **ROFIN DY 060 HP**, which is at the moment the most powerful diode pumped solid state laser Rofin offers to the market. With a guaranteed output power of 6.000 Watt, over 5.000 Watt at the workpiece, this laser is built with six cavities and is characterized by a high efficiency of over 10%, and a diode life of over 10.000 hours. The laser beam is characterized by a divergence of 25 mm x mrad and can be coupled into a fiber with a core diameter of 600 μ m. The HP version, which leads to a compact laser resonator design and which has been developed for creating wider weld widths, will also be available in lower output powers. The well established product line of diode pumped solid state lasers with output powers in the range of 550 to 4400 Watt and a beam divergence of 12 mm x mrad, has its merits where a small focus spot size can improve weld quality or increase processing speeds.

As accessories for its high power Nd:YAG lasers ROFIN offers a fiber-fiber coupling system. This system allows the splitting of the fiber beam delivery making fiber changes easy. The fiber portion which is in a robot cell, and which normally sees heavier wear, can be kept short.

From the series of its diode lasers the ROFIN Macro group shows the **ROFIN DF 025**, a new version with improved beam quality. These diode lasers can be coupled into flexible fibers and enables easy integration with robots. As a result of the redesigned optics, the core of the fiber can be as small as 1.200 μm using a numerical aperture of 0,22. As a consequence of the higher intensities achieved, the focus processing speeds can be increased. As an example, a system for soldering automotive components is shown, which highlights the industrial use of fiber coupled lasers.

The various models of ROFIN's diode lasers are in the power range of 25 – 6.000 Watt and are used direct or with fiber beam delivery depending on the actual application. As the beam geometry can be adapted to the task, diode lasers are ideal tools for heat conduction welds, surface treatment and soldering. Diode lasers are characterized by a high efficiency of over 30%, a diode life of over 10.000 hours, nearly maintenance free operation, and very compact dimensions.

There are also new developments in ROFIN's large CO₂-laser family. For the first time, the **ROFIN RF 050** model will be shown. With an output power of 5000 Watt, at TEM₀₁* mode structure, this radio-frequency excited laser is an ideal tool for thick metal cutting. The RF 050 also shows its strengths at increased speeds for thin metal cutting or welding applications. Because of its patented z-folded design, only four fold mirrors are required in the resonator. As a unique feature, a diamond output window is used. The laser beam is polarized at 45°, making external circular polarization easy. The laser resonator, high frequency generator, and electrical power supply are all integrated into one compact unit minimizing space requirements.

The well proven diffusion cooled CO₂-Slab-lasers now operate even more economically. As with the exhibited **ROFIN DC 035**, with 3.500 Watt output power, all ROFIN slab laser models are now equipped with a new controller. They only need gas changes every 72 hours instead of 24, and the laser gas bottle is integrated into the laser head.

The sealed-off slab laser, in power ranges from 100 to 300 Watt, complements ROFIN's product range at the low power end. The ROFIN **SC-Series** can be used for various applications like the cutting of textiles, plastic and wood, or the cutting and welding of glass. The very compact laser units can also be mounted directly on a robot arm for processing three dimensional parts.

A design study for future developments is ROFIN's new high power disc laser. The disc design is a new solution for diode pumped solid state lasers. Using Yb:YAG as the lasing material, an efficiency as high as 20% could be achieved with further improved beam quality. Today an output power of 750 Watt at 5 mm x mrad divergence or 1250 Watt at 12 mm x mrad can be achieved using the disc concept. Diode modules from ROFIN's daughter company Dilas Diodenlaser are used in this laser design. Dilas is specialized in assembling high power diode pump modules and manufacturing of ROFIN's diode laser series.

Within the ROFIN-group, ROFIN-SINAR Laser GmbH, Hamburg, is responsible for the Laser Macro segment.

The Laser Micro Group – Focus on Fine Solutions

The Laser Micro section covers the applications of fine welding, fine cutting, micro drilling, micro structuring and perforating. Many of the laser products for fine cutting and welding will be demonstrated at the Laser 2001.

The **StarWeld 20** is at the moment, with a width of only 200 mm and a height of 800 mm, the smallest spot welder of its class. The average output power of 20 Watt can be coupled into either one fiber or energy shared into two fibers with a core diameter of 200 µm. Offering a pulse energy of up to 20 J, this laser is the perfect tool for spot welds of electric or electronic components.

The modified version StarWeld 20 Plus is characterized by 35 J per pulse and 30 W average output power and retains the same overall dimensions.

The **StarWeld 90** is also a very compact and powerful pulsed laser source. Giving 90 W average output power it is suitable for various micro welding applications. Most of these lasers are delivered with fiber coupling together with a galvo head and an integrated picture recognition camera. Compared to traditional X,Y-positioning tables this combination has the advantage of higher positioning speeds at reduced investment costs.

The fiber coupled **StarCut 300** is a new system which enables the cutting of nearly all metals. This laser features excellent beam quality of 12 mm x mrad at 300 W average power at the output of the fiber. This enables flexible material processing even of three-dimensional components. As a consequence of the high pulse repetition rates of up to 4000 Hz this system is perfect for high quality cuts, low heat affected zones and high production rates. As a result of the high pulse peak power of up to 15 kWatt, silicon, copper and other materials with high reflectivity can be processed without problems.

As an additional exhibition highlight, a diode pumped solid state laser will be shown, using quasi-cw diodes for excitation. At 15 Watt fundamental mode output power, pulse frequencies of up to 3000 Hz and diode life of over 10.000 hours, this laser model offers solutions for many fine cutting, micro structuring, and micro drilling applications.

In addition to the different laser sources, also some systems are on exhibit which are built based on specific customer demand.

The **StarWeld Performance** model is with over 2000 worldwide installed units, one of the most successful all-in-one manual laser welding system. Its key elements are compactness, customer optimized operating panel, and the special patent pending Sweet Spot Resonator, which eliminates the thermal lens effect.

The high pulse energy of up to 80 Joule and the excellent focusability allows nearly every metal component to be welded with high quality results. The majority of these laser systems are currently used in the dental, jewelry and electromechanical industry.

The **StarWeld Tool** is a special manual laser workstation for the die and tool industry. With this system, defective or worn-out dies can easily and quickly be repaired by welding filler wire onto the tool surface. This process has many advantages compared to the conventional technologies like TIG or micro-plasma welding, especially in respect to repair time and quality achieved. The air cooled SW Tool allows an average output power of up to 100 W and convinces the user with its ergonomically all-in-one concept, and with its patent pending bidirectional swivelling focusing optic.

Within the Rofin group the Carl Baasel Lasertechnik GmbH is responsible for the Laser Micro segment.

The Laser Marking Group – The Mark of Excellence

The ROFIN Laser Marking group presents its wide range of laser marking products for the first time together. In addition to the PowerLine and StarMark laser markers, standard systems and customer designed solutions will be presented.

The **PowerLine E** is the latest laser marker introduced by ROFIN. It is an end pumped laser operating in fundamental mode and offers high beam quality and short pulses. The very compact diode pumped system can also be frequency doubled to 532 nm, and is capable of a wide range of different marking applications for plastic and semiconductor materials. The PowerLine E is also equipped with special innovative greyscale software, enabling the variation of single pulse intensities. As a consequence of this feature, the

processing time for photos becomes shorter and at an even better quality levels.

For the marking of foils, the **LabelMarker D** is a new, even more compact, version of ROFIN's successful line of label markers.

Wear resistant labels are used in industry for identification, product tracing and quality control, mainly in the automotive and electronic industry.

The standard diode pumped 50 W Laser from the PowerLine D series is used together with a reel transport device. The system is equipped with splice recognition, an automatic detection of the end of the foil, and a warning system which recognizes material jam. A blow and exhaust device, and an air filter system is integrated together to guarantee optimum marking results, and minimum contamination of the inside of the cell or the environment. The marked labels are cut to shape with the same laser at an increased power level, and the whole set of labels are cut-off using a roller knife.

As an option, the system can be equipped with a dual reel device and a dual head scanner. This enables the customer to mark different foil material without any changes and allows more powerful lasers to be integrated. The system works fully automatically and can also be used for marking metal plates.

The **SL Manual** system is introduced at the laser exhibition. It is a very compact and ergonomically designed manual work station for off-line marking applications. The StarMark and the PowerLine laser markers can be integrated.

With a depth of only 800 mm this marking system requires only minimum space. The height of the total system is only 1400 mm. The LCD Monitor is integrated into the housing.

The SL Manual is highly optimized especially in ergonomical characteristics. The systems offers large knee room, and the sliding door is easy to open and close. This provides fatigue free operation, even for long hours of operation. The z-position of the laser focus can be varied manually or by the program. As an option, a rotary axis for parts with up to 125 mm diameter can be integrated.

As an example of a turn-key marking system, utilizing the very compact StarMark Diode 40S laser, a system is shown for marking buttons. The parts are automatically fed to a rotating table. The position and angle of each single button is detected by a camera and the marking program adjusted accordingly. This is happening while the parts are rotating in an "on-the-fly" process. In this process, more than 500 buttons per minute can be marked and sorted.

Within the ROFIN group, marking systems are manufactured at Carl Baasel Lasertechnik GmbH, Starnberg, and at ROFIN-SINAR Laser GmbH, Günding. The Günding organization is responsible for the strategical leadership within the Laser Marking group.

With operational headquarters in Plymouth, Michigan and Hamburg, Germany, Rofin-Sinar Technologies, Inc. designs, develops, engineers and manufactures laser sources and laser-based system solutions for a wide range of applications. With production facilities in the US, Germany, UK, Singapore and Japan, Rofin-Sinar is one of the world's leading developers and manufacturers of industrial lasers and currently has more than 14,000 laser units installed worldwide and serves more than 2,500 customers. Rofin-Sinar's shares trade on the NASDAQ National Market System under the symbol RSTI. Additional information is available on Rofin-Sinar's home page: <http://www.rofin.com>

14870 Zeichen

Kontakt:	Laser Macro/ Rofin Gruppe	Thorsten Frauenpreiß Rofin-Sinar Laser GmbH Berzeliusstr. 83 D-22113 Hamburg	Tel.: 040-73363-256 Fax: 040-73363-138 Info@rofin-ham.de
	Laser Micro	Dr. Thomas Renner Carl Baasel Lasertechnik GmbH Petersbrunnerstr. 1b D-82319 Starnberg	Tel.: 08151-776-246 Fax: 08151-776-159 marketing@baasel.de
	Laser Marking	Eduard Huber Rofin-Sinar Laser GmbH Neufeldstr. 16 D-85232 Bergkirchen	Tel.: 08131-704-234 Fax: 08131-704-100 e.huber@rofin-muc.de