

50
FIFTY
YEARS

PRISMA

The WILD Group
magazine

RAY OF LIGHT IN THE FIGHT AGAINST VIRUSES.

▼ **WILD**
▼ **PHOTONIC**



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WE DELIVER.



Josef Hackl
CEO WILD Group

In the blink of an eye, the Covid-19 crisis has turned our everyday life on its head. In uncertain times like these, reliable relationships are more important than ever before. As a "most trusted" partner, the WILD Group has proven worthy of this attribute in recent months. We have taken extremely stringent safety measures and, using agile supply chain management, we have quickly adjusted our material scheduling parameters and built up an additional safety stock. Thanks to the commitment of our 450 staff members working in a special form of shift operation, we are currently able to reliably and quickly manage even the massive rise in orders in the medical technology sector. By manufacturing diagnostic systems also used in the detection of Covid-19, we are making our contribution to ensuring the greatest possible number of tests being carried out.

One thing is sure: The world we live in will be different after the coronavirus pandemic. For many companies, however, it will open up

completely new opportunities. In this issue of our magazine, we will be taking a closer look at one of these: photodynamic disinfection. The possibility of contracting a disease through a simple handshake will be engraved in people's minds, hence the increasingly urgent need for a quick and efficient elimination of germs, viruses and bacteria. This issue of PRISMA presents the solution approaches offered by Photonic in this respect.

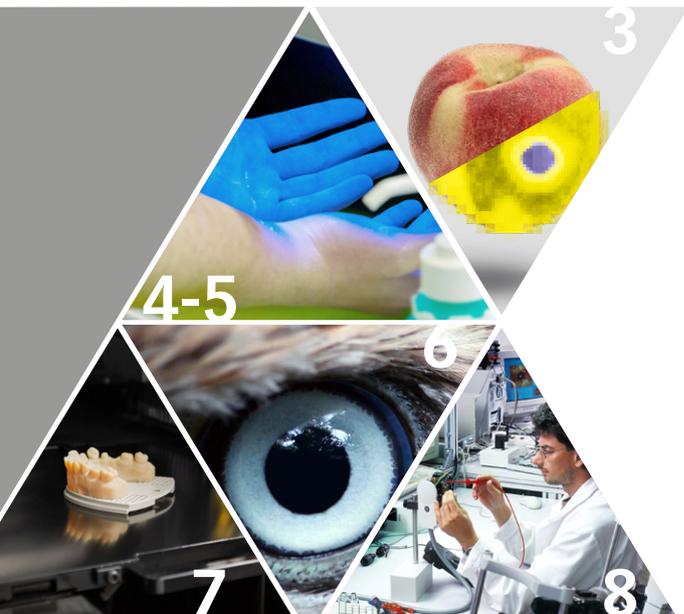
A huge potential for the future can also be found in moiré lens technology and in an innovative Hyperspectral Imaging System that puts quantitative analytics directly into the processing line. The back cover of this issue takes us back to the 1990s, when production of the HRT began.

Stay confident!

Josef Hackl & Stefan Zotter



Stefan Zotter
Photonic Development Manager



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A LAB IN THE PROCESS LINE.

EVK's innovative hyperspectral imaging system brings quantitative analytics straight into your processing line. The device's centrepiece, the NIR spectrograph, was developed together with WILD.



EVK's speciality lies in real-time systems suitable for process analysis with powerful data and high-precision signal processing, which can withstand harsh industrial working conditions. The company's convincing claim for its new Helios EQ32 hyperspectral imaging system is "We bring the lab into your line". After all, its stable optomechanical design was specifically developed for real industrial temperature conditions, machine concepts and application areas. This allows, for instance, for the complete measurement of chemical concentrations in unit and bulk material in Helios EQ32 without having to interrupt the production flow. "In close cooperation with partners like WILD, we have developed a system that allows for completely novel applications in quantitative analytics and which can be used directly in the process line thanks to its real-time capability and robustness. Our customers are now capable of managing difficult or hitherto unsolvable analytical tasks. This ranges from the detection of various toxins in foodstuffs to the determination of production-related parameters such as heating value and humidity in alternative fuels", explains Dr. Matthias Kerschhagl, Head of Research and Development at EVK.

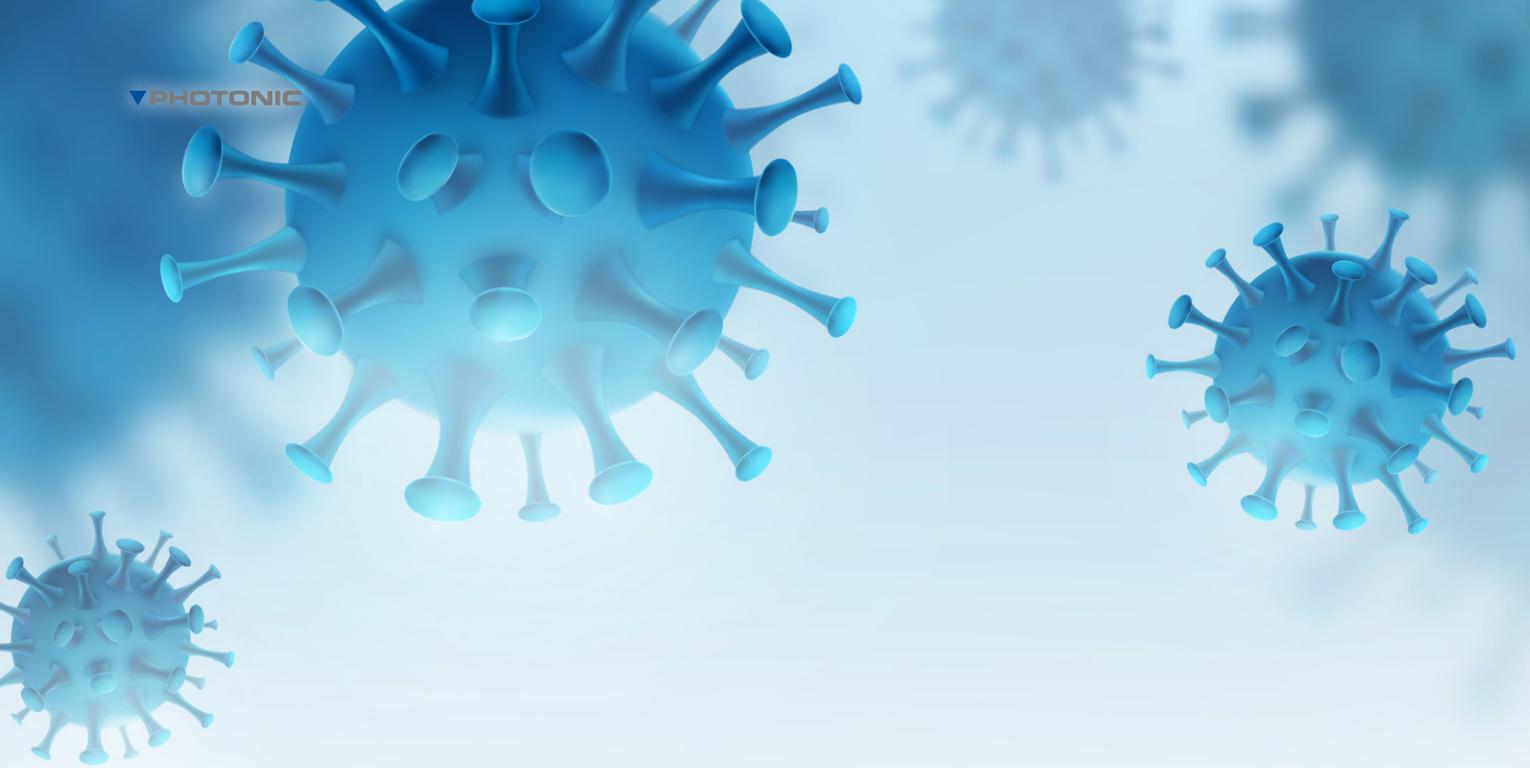
The fact that the entire evaluation process can take place in a single device without requiring an external system

can also be attributed to the WILD Group's expertise. The centrepiece of the device, the NIR spectrograph consisting of a diffraction grating and imaging optics for the camera, as well as the custom-made mechanical components for the system, were developed in cooperation with WILD. "The task of diffraction grating is to split the light reflected from the examined specimen into the spectral colours. One can thus determine the specimen material or other characteristics", explains Stefan Werkl Head of Optical Technologies at WILD.

The greatest challenge in manufacturing consists in reconciling stability and utmost precision. "The NIR spectrograph we produce for EVK will be exposed to harsh conditions like dust, temperature differences of 0 to 50 degrees and to vibrations. The optical components we provide must therefore be correspondingly adjustable and remain stable. At the same time, they must meet the required imaging quality with particularly little scattered light", Werkl explains.

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RETHINKING DISINFECTION.

Light kills bacteria, germs and viruses. And is extremely good at it. The coronavirus pandemic may therefore herald a change of approach to disinfection.

When the outbreak of the new SARS-CoV-2 in China became known in mid-January, the rest of the world did not foresee the far-reaching impact that the coronavirus crisis would have. One of the reasons for the rapid spread of Covid-19 is its ability to survive longer on surfaces and objects than other types of virus. Therefore, authorities worldwide are now trying to contain the spread of the virus by means of disinfection. Regular hand washing and hand disinfection also contribute to stopping contagion.

DISINFECTION BY MEANS OF UV LIGHT

The most commonly used means of eliminating viruses on surfaces are disinfectants. Areas of public life such as, for instance, public transport, food stores or toilets cannot be permanently cleaned using disinfectants. A simple, efficient alternative is disinfection using UV light. This method has been used successfully for several years in food production, drinking water treatment and sterilisation of ventilation systems. The Chinese metropolis of Shanghai even went a step further, using this technology in a wash tunnel to disinfect commuter buses. An even more innovative solution are the autonomous mobile robots that are now killing viruses and bacteria in several Chinese hospitals using ultraviolet light. It is easy to explain why this technology has suddenly been met with such enormous interest: it is quick, cost-effective and reliably eliminates germs, bacteria and viruses.

Thanks to its know-how in the area of light technology, Photonic is ideally positioned to quickly and efficiently implement such application-specific solutions

Stefan Zotter, Photonic Development Manager

“In order to disinfect surfaces efficiently using UV light, you must evenly radiate the object with a sufficient dose. Thanks to its know-how in the area of light technology, Photonic is ideally positioned to quickly and efficiently implement such application-specific solutions”, explains Photonic Development Manager Stefan Zotter. “Our experts recently designed

a UV curing chamber in which 3D-printed objects of any shape can be homogeneously irradiated from all sides using UV LEDs. This requires careful consideration of parameters ranging from the choice and positioning of UV LEDs to the surface material of the chamber, the

control of the individual LEDs and the thermal management of the entire system”. Photonic supports its customers in all product development stages: from the first concepts to serial production, the light experts will contribute their year-long experience in optics, mechanics, electronics and software to the project, thus boosting the success of the customer’s products.

AREAS OF APPLICATION OF PHOTODYNAMIC DISINFECTION

In many areas, however, disinfection using UV light does reach its limits. UV radiation, and especially the short wave UV-C light predominantly used in surface disinfection, is extremely dangerous to humans without adequate protection. The hazardous radiation can cause severe eye injuries and

may lead to cell mutation and cancer when absorbed by the skin. This is the reason why alcoholic solutions are still being used for hand disinfection, which may result in skin irritation when used frequently. Moreover, numerous studies show that most people do not disinfect their hands adequately.

In contrast, photodynamic disinfection uses a harmless liquid called photosensitizer in combination with non-hazardous, visible light. The light-activated substance is applied to the object and reacts with light and air to create reactive oxygen, which very effectively kills germs, viruses and bacteria. This method is very successfully used in the treatment of badly healing wounds and in dental medicine or dermatology. Stefan Zotter believes that “in the future, the combination of hand washing and rigorous rubbing with disinfectants still necessary today may be replaced by photodynamic disinfection”.

“This would involve applying the photosensitizer by evenly rubbing it into the hands and then exposing them to light to eliminate undesirable germs, bacteria and viruses”. The greatest challenge, however, is convincing the people that a device is also required in addition to the disinfectant. The device is a system incorporating a lot of experience and know-how in the field of optomechanics. This is not the only factor that favours Photonic. “Customers who want to

implement innovative disinfection products will benefit from a cooperation with us already when defining the product requirements. When determining the requirements for a specific device, we can resort to a wide range of knowledge stemming from our daily involvement with normative and regulatory safety requirements relating to light generation and control.

Customers who want to implement innovative disinfection products will benefit from a cooperation with us already when defining the product requirements

Joachim Enengl, Photonic Business Developer

Therefore, our customers can be sure that the envisaged properties of their system will pass the reality check of product authorisation and feasibility”, Photonic Business Developer Joachim Enengl explains.

The world we live in will be a different one after the Covid-19 crisis. The possibility of contracting a disease through a simple handshake or by touching a door handle will be engraved in people’s minds. The need for a quick and efficient elimination of germs, viruses and bacteria is bound to grow. Whether through radiation using UV light or the use of photodynamic disinfection, Photonic offers its customers ideal expertise in the area of light technology, allowing them to develop bespoke systems and manufacture these with high precision and accuracy.

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FOCUS IN A FLASH.

WILD has developed the mechanical system of a variable-focus moiré lens for Diffratec, showcasing its micrometre-range alignment and precision manufacturing expertise.

The moiré lens has similar properties as the human eye. It allows you to focus on objects at different distances. In contrast to the human eye, however, it can withstand extremely high light intensities, can react much more quickly to object movements and can be adjusted much more precisely. As a result, it has the potential to revolutionise 3D laser processing and 3D microscopy. Diffratec Optics CEO Martin Bawart is convinced of this and is planning to introduce moiré lens technology to various different sectors. "Due to its robustness to temperature, vibration and pressure, the lens can be used, for instance, as a zoom system for infrared cameras, as correction for defective vision in virtual reality glasses or in the microscopy examination of living cells", Bawart explains.

The greatest challenge in achieving this, however, lies in the demanding manufacturing process. Manufacturing tolerances of mere thousandths of a millimetre are required to ensure the correct functioning of the lenses. In addition, the lens must withstand permanent operation over several years. With WILD, the Innsbruck-based spinoff has now found a development and manufacturing partner who can guarantee these standards. "We were looking for a specialist who has the necessary resources for the implementation of the project and a reputation for top quality. WILD meets both requirements", Martin

Bawart explains. In June 2019, Diffratec assigned development of the mechanical system of a variable-focus moiré lens to the systems partner. "The specific aim was to guarantee highly precise bearing and positioning of the diffractive optical elements and alignment of the optics in the micrometre range. Our development expertise, proven alignment concepts, and experience in gluing technology and precision manufacturing gave us a decisive competitive edge", explains Stefan Werkl, Head of Optical Technologies at WILD GmbH.

The next stage will be the development of a motorised version of the moiré lens. "So far, the cooperation with WILD has been to our full satisfaction. Communication has always been uncomplicated and solution-oriented. They prepared the proposed concepts for us in a manner that was very easy to grasp and helped the ideal project path to quickly take shape. In addition to the high precision shown by WILD in the implementation of the project, there was also a palpable attention to clean workmanship and attractive design", says Bawart.



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THE COMMON DENOMINATOR.

From 3D scanning to 3D printing: The network of three-dimensional data is becoming ever denser. WILD is one of the few development and manufacturing partners who have experience in both technologies.

The daily workflow currently seen in dental practices is indicative of what the future holds. Today, anyone in need of dentures will have them more quickly and precisely made than ever before. An intraoral scanner generates a detailed three-dimensional image of the teeth in just a few seconds and a 3D printer subsequently produces precisely fitting dentures or the required filling. In future, this kind of holistic, digital workflow may optimise, simplify and accelerate processes in many other sectors.

WILD COVERS A WIDE RANGE OF SOLUTIONS

The WILD Group is one of few systems partners covering everything from 3D scanning to 3D printing. WILD brings many years of experience and comprehensive know-how, for example in angle-based geometrical calculations (stereovision, laser triangulation, structured light) or time-based, time-of-flight technology in the digitalisation of 3D objects. "Leading suppliers rely on our expertise, especially in the development and production of sensitive optics modules", says Senior Optics Designer Rembert Fertner. "These modules are used, for instance, in laser scanners that can measure entire buildings despite fog or direct sunlight. In medical technology, for instance, they are integrated in intra-oral scanners or OCT devices. "In the area of 3D printing, WILD also focuses on the development and production of complex

In addition to our longstanding optomechanics competence, we also benefit in such projects from our knowledge in high precision manufacturing, free-form optics, surface engineering and cleanliness processes

Markus Woschitz, Business Developer WILD

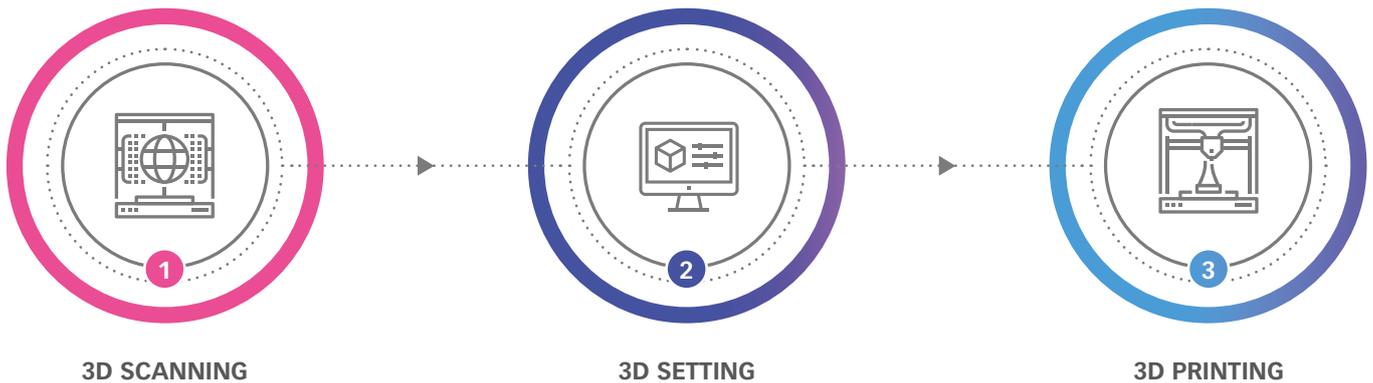
devices. "Our products include systems that manufacture high-performance ceramic parts for medical technology, electrical and mechanical engineering or the aerospace industry", Business Developer Markus Woschitz explains. "In addition to our longstanding optomechanics competence, we also benefit in such projects from our knowledge in high precision manufacturing, free-form optics, surface engineering and cleanliness processes". A young high-tech company recently

developed a 3D printer together with WILD which can print plastic components with structural details as small as 100 nanometres. The device operates at speeds 100 times higher than conventional high-resolution 3D printing systems and is capable of even gently weaving living cells into the 3D structure.

"In future, pre-processing and post-processing units and quality assurance will become increasingly important. WILD is also involved in the development and production of such systems", says Woschitz. One example are high-speed cameras that can automatically control quality in melt pool monitoring.

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50
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1999

THE MEASURE OF ALL THINGS.

Heidelberg Engineering's HRT is a pioneering feat in ocular diagnosis. Since 1999, they have placed their trust in a cooperation with WILD.

It all began with the ingenious idea of the Heidelberg Engineering founders to significantly improve patient care by means of three-dimensional analysis of the optic nerve. Based on this idea, they developed a product which heralded a completely new era in ophthalmology and is considered the gold standard in diagnostics: the Heidelberg Retina Tomograph. It has, among other things, revolutionised the early detection of glaucoma by allowing high-resolution digital images to be compared with normative data and earlier scans. WILD took over production of the tomograph back in 1999. "The centrepiece of the HRT2, for which WILD also designed and implemented the entire mechanical system, was

an extremely small but complex camera unit. This posed a major challenge in terms of adjustment, since we had to integrate micromechanical, electronic and optic components in a very small space", Christian Doujak, Head of Sales at WILD Electronics explains.

Today WILD can look back on more than 20 years of close and collaborative cooperation with Heidelberg Engineering. During this time, the HRT has undergone ongoing improvements, so that it continues to be the undisputed market leader. The diagnostic device is now significantly smaller, more user-friendly and comes with a far more powerful software.

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THE WILD GROUP

The WILD Group is comprised of the WILD brands which are established in Völkermarkt, Wernberg and Trnava/Slovakia, as well as Vienna-based Photonic. The Group's 451 highly qualified staff members are always the first choice when precision and reliability are a must and when innovations are called for.