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FOR BUSINESS

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science.nl



SCIENCE TECHNOLOGIES THE NETHERLANDS

bigscience.nl



Science and technology have been changing the world significantly in our lifetime. Often in a way we couldn't have imagined. Imagination, curiosity and perseverance are the leading (f)actors on this playground.

Big Science is the domain where scientists and engineers get together and stimulate each other to great heights. Scientific questions demand the utmost of technology to push the frontiers of our knowledge. And the answers lead to new questions which are even more challenging. This continuous cycle determines the activities of many public research institutes in the Netherlands. These institutes represent an invaluable asset of the Dutch science practice. Ultimately they also lead the way to innovation: in space, the medical sector, ICT etc. We all know the examples.

But industry is also invaluable in keeping the cycle running. There is an increasing demand to develop the complex technology that is required. And industry is eager to be involved, not primarily for making short term returns on investment, but to exploit the opportunities to increase or improve existing expertise, to be able to introduce new technologies in existing markets, or to penetrate new domestic or foreign markets. This is not without risk, it requires vision and courage to invest, failure is an option, but the gain can be high. Government support can help to alleviate the risks, and only then Big Science can thrive, even in a relatively small country as the Netherlands.

The Netherlands have been investing in many Big Science programs already with great success. The continuation of these successes is not obvious. Big Science facilities are increasingly expensive and only an international collaboration of member states can build and exploit these facilities. Tendering for Big Science contracts is another issue: a large variety of skills is required, as well as a high level of confidence between scientists and engineers. Large companies are often experienced in international collaboration and can

maintain the skills that are required to operate in these collaborations. This is not always the case for smaller companies. The network of Industrial Liaison Officers (ILOs) can support the companies in their efforts to earn contracts from Big Science facilities. Usually every facility has an ILO in each member state, who can establish and maintain the bridge between the facility and national industry. In this role the ILOs also help to create business from the (geo)return on Dutch investments in Big Science facilities.

The Netherlands Organization for Scientific Research (NWO) is supporting the network of Dutch ILOs for Big Science. They jointly distribute the information about Calls for Tender, organize network events and can support the companies in their efforts for tendering.

This brochure shows the technologies that are of key importance for the development of large research infrastructures on the basis of the companies who are or desire to be active on this market. The ILO-net has seen the number of Dutch companies growing in the course of the past 10 years, which we consider as a strong signal for the relevance of Big Science for science and innovation. This brochure is completely revised on the occasion of the annual Precision Fairs that are organized by the Mikrocentrum at the end of the year. The ILO-net has been very fortunate to attend these events already for many years, and to present the Dutch companies the opportunities to enter the Big Science market.

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MEMBERS ILO-NET

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**ELECTRICAL,
ELECTROMECHANICAL
AND RF SYSTEMS**

ELECTRICAL, ELECTRO- MECHANICAL AND RF SYSTEMS	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	Supply System Supplier R&D	Development	Engineering Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal Large														
						Mechat. Small	Gyro	Vacuum	Electronics HW	Software									
Advanced Electro-magnetics BV		motors; magnets; actuators	0209; 0225; 03	electro mechanical automation		x			x	x		x	x	x		x	x	x	
DARE!! Products BV	M	development; projects	0250; 0350; 03	EMC; simulation					RF; analog								x	x	x
High Voltage Potting and Coating (HVPC)	s	sealing/packaging electric components	03	sealing, potting and coating; high voltage									x					x	x
Linear Technology Corporation (LTC)		high performance analogue ICs	0301; 0305	power; RF; data conv; signal proc; sensor network					integrated circuits	embedded							x	x	x
Magnetic Innovations		customized electromagnetic solutions	0207; 0209; 0225	direct drive motors; generators; moving magnet actuators		x							x				x	x	
MTSA Technopower	S	high power switches; process equipment	0210; 03; 02; 09	turnkey systems; on-site service; customer specific		x			power									x	x
National Instruments	L	graphical tool for system development	0207; 0350; 040509	labview; I/O-hardware; controllers					x	x			x				x		x
Technobis Group	S	suppl. high tech instruments and modules	0207; 05; 06; 08	turnkey projects; proto; serie; exotic material; fibre		x		x				x					x	x	x
Technolution		high-end electronic HW&SW applications	03; 0303	customer specific development and engineering					high speed data acq	embedded	x						x	x	x
Topic Embedded Products BV	S	embedded software & hardware products	0303; 030409; 030406; 039005; 040101; 0401006; 040410;05	development kits; FPGA-programming; board dev.					x	embedded, HPC	x	x	x				x	x	x

ADVANCED ELECTROMAGNETICS

COMPANY PROFILE

The AE-GROUP has more than 75 years experience with the manufacturing and distribution of electrical motors and actuators, ranging from greenhouses to military, automotive and aerospace applications. We are a technological center with in-house experienced specialists in all relevant domains (from simulation to manufacturing, from electromagnetics to fluid mechanics and from training to auditing and grant proposals) which take advantage of dedicated analysis and design software tools.

PRODUCTS

- **Electrical motors and generators:** a broad range from general to servo-drives or traction applications, from standard frame sizes and models to custom designed electrical machines
- **Test-benches for electrical motors and systems:** computer controlled test-stands for electrical machines and drive systems (features: adjustable mounting platforms, integrated power analyzer, graphical user interface, various types of sensors, programmable load curves)
- **Magnet assemblies and magnetic materials:** design, analysis and/or manufacturing of custom magnet assemblies, permanent magnet rotors/ translators for electrical machines
- **Electrical motor components:** off-the-shelf or custom made coils and windings, lamination stacks, permanent magnets, insulation materials, brushes and brush-holders, etc.



Dr. ir. Johan J.H. Paulides

Director

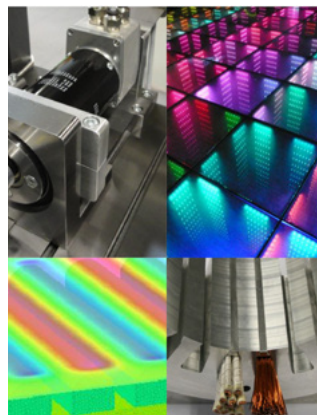
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SERVICES

- **R&D and technical consultancy:** the in-house know-how and a close cooperation with selected partners enables us to provide expert consultancy concerning the electromagnetic, mechanical, thermal, power conversion and control aspects of complex electromechanical solutions and mechatronic systems.
- **Measurements:** facilities and qualified operators for prototype- or production-level testing of electrical machines and transmission gears covering a broad power range.
- **Manufacturing:** facilities for the manufacturing of electrical machines, electromechanical actuators, precision machined components for both series and prototype production.

SOFTWARE

- **SPEED and Motor-CAD:** exclusive distributor the Benelux area



DARE!! PRODUCTS BV

DARE!! Products is a high-tech Research & Development company based in Woerden, The Netherlands. DARE!! Products is specialized in the development and production of analogue RF and EMC measurement instruments and EMC/microwave systems. In the past 25 years DARE!! has acquired a strong name in RF electronics. With the successful implementation of several challenging RF projects for civil and military use, DARE!! Products is always pushing the limits.

SPECIFIC EXPERTISE INCLUDES

Our expertise lies in the field of:

- RF signal generation
- Analog LASER applications
- Custom made RF filters
- Custom made RF mixers
- Custom made antennas, including custom patch antennas

In our state-of-the-art facilities we can simulate designs, build fast prototypes and perform accurate measurements. As we can perform all project activities in house, we have a very short research and development cycle. Next to the hardware development we have our own embedded software team.

REFERENCES

Over the years DARE!! Products has performed projects for Dutch Defence, Dutch Government, Chinese Space and many private companies. Our specialised measurement systems are sold worldwide to renowned customers. Recently DARE!! developed a High-Power S-Band Passive Inter Modulation (PIM) and Ku-band Multi Carrier test systems for SatCom applications. DARE!! Products has also supplied a large number of power meters to the particle accelerator XFEL in Germany. In this application the RadiPower® measures RF fields of subatomic particles traveling at the speed of light!

DARE!! also has developed the current most accurate electric field probe in the world! The RadiSense® 10 is used all over the world to perform unprecedented E-field measurements!

In 2018 DARE!! Products provided on-site test system installation management for a 40 GHz EMC test facility at Krylov State Research Centre in St. Petersburg, Russia.

DARE!!
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HIGH VOLTAGE POTTING AND COATING (HVPC)

High Voltage Potting and Coating, is self-reliant since 2002. We are specialized in winding, assembling, potting, coating and testing of high-tech products. Being experts makes us also the best possible advisors in this field. These products are mainly for the medical- and defense industry, but we also have customers in the aviation industry.

HVPC is a dynamic production company with few hierarchical lines. These short lines result in quick settlements and a strong workforce. The workforce increased through the years from 8 to 18 enthusiastic employees.

HVPC sets high demands for its performance. The product quality, service and reliability of the deliveries are among the best in the world. H.V.P.C. logistics uses short channels and therefore purchasing activities are quick, control is good and delivery times are reliable.

Adapting to developments in the market with the help of innovative technologies and shaping an effective organization with flexible processes are characteristic of H.V.P.C. The flexible processes result in the possibilities to produce single pieces or small series.

PRODUCTS

HVPC is specialized in single production or small series. H.V.P.C. produces a large variety of products (durable types), both existing as new designs, which can be realized in consultation with the client. HVPC is a production company for mainly high-tech inductive components, such as (high voltage) transformers, choke-coils and deflection coils. Also high-tech power supplies and high-tech connectors poured into as well as oil and different synthetic materials (silicones and epoxies).

REFERENCES

Thales – ASML – FEI – Selex



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General manager

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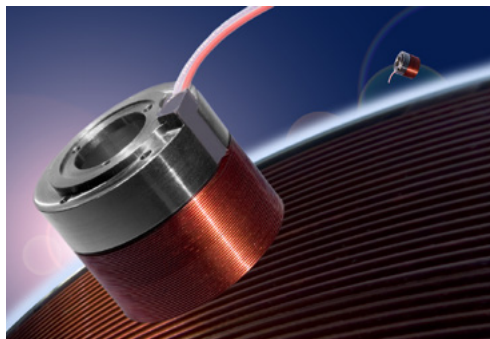
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Turnover: 2,5 M€ | 18 Employees

www.hvpc.nl



LINEAR TECHNOLOGY CORPORATION (LTC)

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for over 35 years. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems.

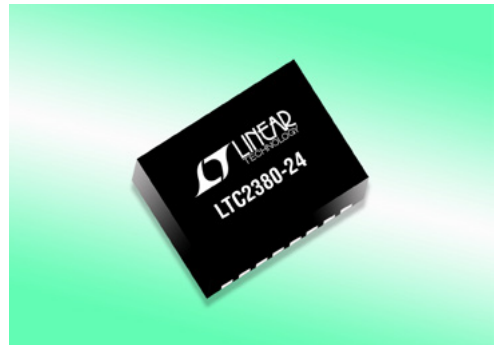
PRODUCT INFORMATION

- Linear Technology Corporation produces products covering:
- Power management
- Data conversion
- Signal conditioning
- RF and interface ICs
- μ Module subsystems
- Wireless sensor network

Collection conveniently assembles some of the most popular designs from our data sheets, design notes and application notes. The Linear Technology Blogs offer insights into applications directly from our team of analog gurus – by engineers, for engineers.

SOLUTIONS

Linear Technology Corporation provides expertise not only on the workings of our parts, but also the larger, often complex problems customers are looking to solve. The Linear Technology Circuit



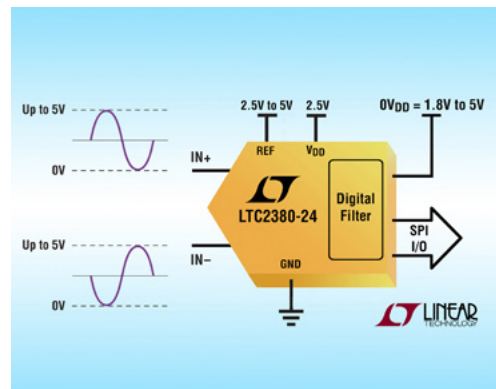
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MAGNETIC INNOVATIONS

Most engineers struggle to find the right direct drive motor technology for their application. We offer our help and expertise to those engineers. We provide them with quality electromagnetic solutions starting from idea up to production and delivery. Helping them every step of the way, so they can build applications with direct drive motors that are highly efficient and reduce the cost of ownership of their systems.

OUR PRODUCT: DIRECT DRIVE MOTORS

At Magnetic Innovations we want to exceed customers' expectations. We focus on bringing high quality direct drive motors into the market with a fair price for our customers. Our main emphasis is on direct drive linear and rotary motors & generators and moving magnet actuators. Our direct drive motors:

- Are reliable and have a long life span.
- Have a high torque density.
- Do not require transmission.
- Meet the IE4/IE5 efficiency class.
- Have a low carbon footprint.
- Offer higher efficiency while being smaller.

CUSTOM HIGH TORQUE MOTORS

We do not believe in a one-size-fits-all mentality. Every customer is unique and so are



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their applications. That is why we also design electromechanical products tailored to and optimized for the customer application. Based on the customers' requirements, we develop our motors and solutions for their application. This process starts with just a simple e-mail or phone call to our sales department, you can find our contact information below.

MARKETS

As Magnetic Innovations we are a global supplier for the Semiconductor, Aerospace, Industrial, automotive and Consumer markets. Working with us, will guarantee high quality standards, reliability and advanced technological know-how. You will get a partner you can build on and trust.

WHAT MAKES US DIFFERENT

To ensure the excellent quality of our products, we have an outstanding team working in our ISO 9001 certified production facilities. They collaborate closely with our R&D department to ensure that we fulfil all customer requirements. At magnetic Innovations we strive for excellence in everything that we do. We are a company that goes that extra mile for her clients and emphasize strongly on reliability. That is one of the reasons why clients have stayed with us for years.



MTSA TECHNOPOWER

MTSA Technopower designs and builds customer specific equipment, installations and machines. MTSA Technopower has own products which are used for switching high power at short circuit laboratories and atomic fusion. MTSA Technopower offers production capacity (manufacturing and assembly) and on-site service.

PRODUCT INFORMATION

To initiate the atomic fusion process large amounts of energy need to be applied in a controlled manner. MTSA Technopower developed high power switches to make or break a high current at the right moment.

Typical products we supply:

Make Switches – Safety Break Switches – Separators
– Rogowski measuring systems

This type of equipment is being applied at KEMA, JET and various other short circuit laboratories, e.g. KPT, Toshiba, EETI, KERI and Ormazabal.

In addition MTSA Technopower designs and builds customer specific equipment, installations and machines. Within the nuclear sector we acquired a great deal of experience by taking over KEMA Techniek in 2003 and close relations we maintain

with scientific institutes within the Energy Sector like ECN, NRG and TNO.

For the nuclear sector we designed and built for instance:

Special remote handling systems for application in radio active environment – High power switch systems – Gas dosing systems – Special machines – Prototype installations – (Spare) Parts and modules/subsystems

Customer specific projects can be divided into the following stages, whereby we can join at any level:

Concept engineering – Basic engineering – Detail engineering – Procurement and manufacturing of parts – Assembly – Testing – Installation and commissioning – Maintenance



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NATIONAL INSTRUMENTS

Committed to Engineers and Scientists – Since 1976, National Instruments has equipped engineers and scientists with tools that accelerate productivity, innovation, and discovery. NI's graphical system design approach provides an integrated software and hardware platform that simplifies development of any system that needs measurement and control. Engineers and scientists use this platform from design to production in multiple industries, advanced research, and academia.

ACCELERATE DEVELOPMENT

Researchers accelerate their development using highly productive NI LabVIEW software that integrates and abstracts the complexity of systems at multiple levels, including unprecedented visualization of system timing. They can lower total systems cost, increase flexibility, and integrate new technology easily using off-the-shelf customizable hardware that meets system needs from low power to high performance.

INNOVATE FAST

The flexibility and scalability of the platform, supported by a growing eco-system of reusable IP and applications, gives engineers a strong competitive advantage in completing more projects with less time and resources. Thousands of engineers successfully use the NI graphical system design platform today to innovate, discover, and invent their own solutions – fast.



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TECHNOBIS GROUP

Technobis Group is a developer and supplier of high-tech instruments and modules for the most dedicated national and international OEM companies.

Core competencies: photonics, mechatronics, assembly and testing.

TECHNOBIS MECHATRONICS

Technobis Mechatronics specializes in complete product development projects, from the initial idea to a successful turnkey product, prototype or series product. The main scope for which we use our technologies and competences are amongst others the complete turnkey delivery of:

- Inspection / measuring systems
 - Probe manipulators
 - Optical inspection systems
- Handling systems
 - Servo driven manipulators
 - Gripper units suitable for harsh environments, remotely operated
- Vacuum chuck units suitable for harsh environments, remotely operated
- Design and engineering of graphite, carbon reinforced carbon and other ceramic parts used for the handling of products in a harsh environment.
- Life science instruments
 - Crystallization research
 - Confocal fluorescence microscopy

TECHNOBIS FIBRE TECHNOLOGIES

Technobis Fibre Technologies specializes in the development and supply of total solutions in high-speed, high-resolution and multi-sensor fibre interrogators and sensors.

Optical fibre sensors find widespread use in a multitude of applications due to their small size, light weight, inertness to chemical substances, ability to withstand high temperatures (~900°C) and immunity to electromagnetic interference. As a result, optical fibre sensors are frequently used for applications such as structural health monitoring, condition based maintenance and other specific sensing applications. Technobis Fibre Technologies current interrogator systems allow resolution levels ranging from 1 picometer down to 2 femtometer wavelength shifts, allowing the user to detect nano strains at speeds up to 80 kHz or higher. This is of great benefit in a large number of highly demanding applications. In order to meet growing demand from the market, Technobis Fibre Technologies has initiated a trajectory to develop Photonic Integrated Circuits for the new generation of interrogators capable of meeting at least the same specifications.

REFERENCES

ASML – Fei – Airbus – Boeing – NLR – Tata Steel – Vistec – Polytec – IHC – RGS development

Technobis Group



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TECHNOLUTION

TECHNOLUTION; THE RIGHT DEVELOPMENT

Your end result is our passion. Using our knowledge of technology and taking from our vision of your domain, we elicit what your needs and demands are, keeping the dialogue open and encouraging your participation throughout the whole process. With this approach we develop a user friendly and technically smart solution.

CURIOSITY AND INNOVATION

Ever since we started 28 years ago, we are driven by curiosity and innovation. Our 180 colleagues thrive on bringing new technologies to practical applications in your domain. We are always working at the edge of what is technologically possible, but turning novel technology into working practical solutions.

PRODUCTS AND SERVICES

We design and develop high-end electronic products e.g. hardware, software and applications for customer specification and for our own products. Our core markets are Mobility, Energy and Science&Industry. We have designed, built and delivered products and systems for electron microscopes, lithographical machines, medical systems, etc.

UNIQUE SELLING POINTS

- We provide solutions (hardware, software, building block, IP) for high-end equipment.
- We excel at the combination of hardware and software
- We have a track record in extremely high speed data processing and acquisition
- We build and deliver solutions for very demanding environments
- With combine technical and application domain knowledge



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TOPIC EMBEDDED PRODUCTS

COMBINABLE AND COMPATIBLE EMBEDDED ACCELERATION SOLUTIONS

Topic Embedded Products provides an innovative and complete ecosystem of embedded hardware and software products to accelerate your development.

Our ecosystem guarantees:

- The highest quality for both the hard-and software parts of our solutions
- All products are combinable and compatible
- High quality solutions for today, build with the future in mind



Dypl0 (Dynamic process loader) offers a platform development kit (PDK) to develop applications combining FPGAs, embedded processors and standard PCs in a simple and controlled way within the same programming context. Dypl0 operates as a bridge between processing platforms of choice, enabling engineers to perform their work using their typical development environment while programming functionality of other platform parts as an integral part of their application. Dypl0 delivers:

- Software threading enabled on FPGA logic
- Runtime re-use of FPGA fabric by making intensive use of partial reconfiguration
- Out of the box CPU & FPGA integration, certifiable and reliable infrastructure



Embedded
in your future

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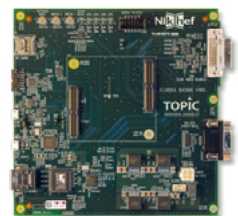
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www.TopicProducts.com

- Simplified functional redundancy without compromising performance

The Miami System on Module (SoM) family is based on the Xilinx Zynq SoC and FPGA-only technology. This highly integrated and compact off-the-shelf solution for today's high performance embedded systems runs a state-of-the-art Linux distribution enabling an out-of-the-box design start experience. The SoM boards can be used for prototyping as well as end-product integration. Your prototype developments can start tomorrow when clicking your Miami on our standard Florida Carrier Boards. Dsign Services offer you customization services based on the standard Topic Embedded Products products. This helps you to fast-track your application to the market against manageable costs and solid quality. CERN related project: We have developed in collaboration with NIKHEF a video frame grabbing and processing application based on a Miami SoM and Florida customized carrier board for the large Hadron collider displacement measurement at CERN. The following customizations were part of this project:

- Carrier board development based on Florida PCIe carrier board
- Rapid prototyping and first-time-right board production
- Connects 1980's technology with present day infrastructure
- High-speed A/D converter to capture analog video signal with high resolution
- Custom FPGA functionality to synchronize and capture video
- Uses the Linux Industrial I/O framework for high-speed data acquisition





1.1 **ELECTRICAL, ELECTRO- MECHANICAL AND RF SYSTEMS**

**CABLING AND WIRING (POWER, RF, FIBER,
SUPER CONDUCTING)**

CABLING AND WIRING (POWER, RF, FIBER, SUPER CONDUCTING,)	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	Supply	System Supplier	R&D	Engineering Development	Production / Assembly	Test & Measurement	
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal																	Software
					Large	Small	Mechat.	Gyro	Vacuum	Electronics HW												
CAPABLE BV	S	cables and connectors	0205	unique custom specific development											x		x	x	x			
MCap Cable & Glassfiber assemblies		high-grade copper, fiber cables and modules	020505	design/assembly optical; copper combined with tubes						x						x		x	x	x		
Romal.com	S	wire, cable and connectors supply	0205	off the shelf cables; short delivery time from stock																		
Steered Technology	S	electric and optic interconnection systems	0205; 030204; 0303; 0804	development of cable assys; fibers; foils; connectors						x					x	x		x	x	x	x	

CAPABLE BV

Cables and connections. That is the strength of Capable BV Cable Application Engineers. We develop customer-specific specialty cables and connectors as well as systems for a broad diversity of applications in high-tech environments (e.g. space industry, offshore and medical).

Years of experience, a broad knowledge base and expertise in specialty cables are the basis for our solutions. You won't find a catalog at Capable; we develop unique solutions for every individual application. Capable is part of the TKH Group NV, an international group that is specialized in advanced telecommunication, electrical and industrial solutions (www.tkhgroup.com). Capable is an exclusive partner of Axon' within the BENELUX.

PRODUCTS AND SERVICES OF CAPABLE BV

- Innovation support
- Micro-connection
- Micro assembly



Mr. Alex de Wijs

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MCAP CABLE & GLASSFIBER ASSEMBLIES

MCAP is the specialist for designing and assembling high-grade copper cables, fiber optic cables and modules, which are used in various industries and markets. From milking robot to electronic pyranometer and professional video camera system to underwater telescope. Together with you, we look for the cable or fiber optic connection that best fits your specific circumstances.

CABLE ASSEMBLING

The optimal cable assembly, focusing on your specific application. With optical fibers, copper or combined with tubes for air, water or oil. We will design it for you or build it according to your drawing. Whatever you want, we make your connection.

SYSTEM MODULES

From loose components to a sub-assembly or an end-product. MCAP builds modules or devices in small to medium quantities where quality and reliability comes first and the delivery time will be no issue. Assemblies you can rely on.

EXTRAORDINARY PROJECT

Nikhef develops a super-telescope that detects neutrino particles from distant astrophysical sources such as supernovae, gamma ray bursts or colliding stars. KM3Net consists of a network of cables and spheres with detectors and has a size of over one cubic kilometer.

SPECIAL CABLES

For KM3Net we helped developing tubes with a combined length of 800 meters with power wires and optical fibers. These tubes of 40 meter are linked together between glass spheres with sensors, so called Digital Optical Modules. The tubes are filled with oil to withstand high pressure at a depth of 3 to 5 km in the Mediterranean Sea.

These kind of challenges we like to enter, because where others say something is impossible, MCAP continues.



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Owner/Director

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Romal is a technical wholesaler from Utrecht in the centre of the Netherlands. Our company was founded in 1932 and remains a family owned business even today. Our focus is on the business to business market. With our broad range of products we target the Broadcast, Data/Telecom, Catv/ Satellite, Security, Coil winding, Isolation, Industrial and Installation markets.

QUALITY

If there's one thing our wide range of products have in common it's quality. We are constantly looking for the best products to fulfil our customer needs and further complete our product range. Therefore we have a strong product range with excellent products and reliable suppliers who stand behind their products a complete 100%.

STOCK AND VISION

We hold more than 2.000 different products on stock to have a quick and reliable order fulfilment time. With our active stock policy we try to keep our stock as current as possible. This also means that we add new products on a regular basis.

Next to quality we see that lead time is becoming more and more important for our customers. It's part of our company vision to have a large stock

position. This may not seem as the most logical thing for a business economist but over last 80 years it proved to be an important trademark for Romal. Many of our customers thrive to keep their stock positions as low as possible. This is only possible if they have a reliable partner with a good stock position. Romal is that reliable partner. And in case we don't have stock we can guarantee a quick delivery because of our broad range of suppliers.

PRODUCT MANAGEMENT

Our product manager continues to look for new products or combinations of existing products. This can be cable assemblies but also customer specific cable, which we can deliver in small batches if needed. We also have a number of product specialists who can advise our customer and handle their specific needs professionally.

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Accountmanager

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STEERED TECHNOLOGY

Connecting the dots to make your system work!

steeRED Technology, founded by experienced industry professionals, is an interconnection system development and supply company. We use internal resources as well as the capabilities and resources of our partners to make new developments possible and to maximize productivity for our customers.

OUR TECHNOLOGIES:

- Connectors and other interconnection components.
- Copper cable assemblies
- Foil & Flex based interconnect solutions.
- Fibre Optic cable assemblies and subsystems.
- High Speed copper cable assemblies
- Solutions for verification and characterisation testing.

Our team has over 80 years of experience with developing and selling interconnection systems. In 's-Hertogenbosch we do have our engineering, prototyping and testing capabilities and we also work together with carefully selected partners to have access to those technologies which can make the difference for the value we want to bring to our customers.



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1.2 ELECTRICAL, ELECTRO- MECHANICAL AND RF SYSTEMS

POWER SUPPLIES DC, AC,
HIGH FREQUENCY, HIGH CURRENT, HIGH VOLTAGE

POWER SUPPLIES DC, AC, HIGH FREQUENCY, HIGH CURRENT, HIGH VOLTAGE	Company size	Speciality (USP)			Area							Service	Supply																																		
																			Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal							Project Management	Systems Engineering	Technical Consultancy	System Supplier	R&D	Development	Engineering	Production / Assembly	Test & Measurement										
		Large	Small	Mechat.	Gyro	Vacuum	Electronics HW	Software																																							
Delta Elektronika BV	S	DC power supplies	0305	custom specific development						power supplies											x																										
Vonk		high power conversion systems; RF	0305; 0201	RF; AC and DC tailor made power electronics						RF high power	x		x	x	x			x	x	x	x																										
Prodrive Technologies	L	powerconversion; motion control; vision	0207; 0210; 0305; 0405; 07	in house production of all components			x			power supplies	data processing					x		x	x	x	x																										

DELTA ELEKTRONIKA BV

DC POWER SUPPLIES

Delta Elektronika designs and manufactures DC power units since 1959. A power supply is seen as a minor part of any equipment and often taken for granted. For many just an electronic box ordered at the last moment. It can be compared with our heart. It's often neglected and we tend to pay even more attention to our hair. But if the heart fails the system goes down.

DESIGN CONCEPT

By reputation, a Delta power supply must be reliable. This is why our design concept has a strong emphasis on excellent technical specifications and long life. The specifications of our products may seem unrealistic but turn out to be even better when measured. Delta users expect perfection and an almost infinite life time at continuous full power and low cost of ownership. An ongoing research program has resulted in production designs that can meet an ever increasing number of specifications.

RESULT

As a result of our design philosophy the units react more than 10 times faster on load transients, produce hardly audible noise and produce 10 – 30 times less electromagnetic interference. Delta customers will never face any problems due to radiated or conducted emissions of our power supplies. The same design philosophy applies for immunity: the toughest standard is not good

enough for us. A Delta power supply will operate totally reliably even in a very noisy environment. All our power supply units are thoroughly tested before being dispatched to the customer. All this ensures the long term correct functioning of each unit and client satisfaction. Delta Elektronika produces world class DC power supplies. We are proud to hear our customers say: "you are making them too well."

SERVICE AND SUPPORT

Just designing and producing excellent products is not enough. At Delta we believe that excellent power supplies are incomplete without outstanding service and support. Only the best manufacturers do not let you down when problems might occur. We keep on helping. Also when equipment has been bought many years ago or when you made the mistake.

For us it is only natural that Delta users get technical support and advice about applications within 24 hours. Lead times are as short as possible and our product support is at least 10 years after the production of a unit has been stopped. Just because our customers appreciate this.

Delta Power Supplies: excellent products, excellent service!



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Vonk optimizes power conversion systems in a rapidly changing industrial market. Inspired by technological developments, Ampulz is contributing to a sustainable environment.

Our solutions find their way into various applications for:

- Industrial processes
- Nuclear fusion research
- Particle accelerators / synchrotrons
- Electricity distribution grids and Renewable energy

As an independent partner, we provide and maintain systems between grid connection and your primary business process. Solutions are based on standard components and existing "building blocks" tailored to specially designed converters or drive systems. Together with you, we realize savings, higher availability and accuracy at system level, by realizing the best-suited solution with knowledge and experience from your process.

We have gained a strong reputation of tailor made Energy Conversion solutions up to the following figures:

- current: up to 150 kA
- voltages: up to 100 kV
- rated power: up to 20 MW (continuous)
- up to 150 MW (pulsed)
- frequencies: up to 100 kHz
- stability: down to 1 ppm

When the stakes are high and power conversion is key and complex, invest your trust in Ampulz. Our independent solutions and services are unparalleled throughout the world.

Some of our references for scientific institutes: ESRF – 2.4 MW booster power supply, Quadrupole power converters, Forschungszentrum Jülich – Septum Magnet power supply, HFML Nijmegen (NL) – 20 MW DC Converter System Modular Conversion System and 15 kA power supply for super conducting magnets, ASDEX upgrade IPP Garching (D) – Extension of the Pulsed Power Supply Network of ASDEX, Helmholtz Zentrum Berlin (D) – 8 MW 20 kA Power Converter System, Solvin Antwerp (B) – 1 MW PEM fuel cell conversion system

Ampulz | Energizing Ambitions

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Manager Sales & Services

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PRODRIVE TECHNOLOGIES

A PASSION FOR TECHNOLOGY

Quite literally everything centers on the customer, our passion for technology, and on constantly improving our business processes. This 'DNA' has been crucial to our company since we began operating in 1993 and it's the foundation of our success as well as that of our clients.

Working for – and usually in close partnership with – you, we develop and produce electronic and mechatronic products and systems with an exceptional price-performance ratio. We can do this because we have smart ways of optimizing, integrating and robotizing, and because we produce everything we need in-house. These are just some of the reasons why we've been able to build a competitive edge over all other providers of technical solutions, anywhere in the world.

RELEVANT TECHNOLOGIES

- **High end computing:** We serve various markets with a focus on real-time / lossless data processing where we can provide processing, storage, communication interfaces and complete computing platforms (filled cabinet), including sophisticated software.
- **Power conversion:** Power conversion is at the root of Prodrive Technologies. For over 20 years, we develop and manufacture power solutions for the Industrial, Medical, Automotive and Energy & Infrastructure markets. We provide off-the-shelf power components, power modules and power systems as well as customer specific solutions tailored to your needs.
- **Vision and sensing:** Prodrive Technologies is one of the few vision & sensing solution providers with the capability and know-how to provide you complete opto-electronic solutions. We support different types of sensors, amongst others: visual (area and line, hyperspectral), infrared, x-ray, radar, particles. Furthermore, all types of digital communication interfaces and processing are readily available.
- **Motion & mechatronics:** Our solutions are unmatched in the combination of electronics, motion control, electro magnetics and precision mechanics, and are applied e.g. in the semiconductor industry.



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1.3 **ELECTRICAL, ELECTRO- MECHANICAL AND RF SYSTEMS**

PRINTED CIRCUIT BOARDS

PRINTED CIRCUIT BOARDS	Company size	Speciality (USP)			Area							Service	Supply					Test & Measurement	
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal														Project Management
						Large	Small	Mechat.	Gyo	Vacuum	Electronics HW	Software							
Megahard		high end electronic PCB serviceprovider	03; 0303	3D-design; prototyping; production; programming						including enclosures	FPGA		x	x		x	x	x	
Neways		one-stop-provider Electronic Manufacturing	030105; 030210; 0303	PCBA's; cables; microelectronics and box build applications						x	embedded		x			x	x	x	
Sintecs		high speed PCB electronic design service	03; 0303	modular systems; embedded SW; spec. products						FPGA	embedded			x		x	x	x	
TBP ELECTRONICS	S	electronics manufacturing service (EMS)	03; 0303; 04	lifecycle solutions; PCB design; assembly and test						PCB large series	x		x			x	x		
Thales Group Competence	S	competence center for printed circuit boards	03; 0303; 04	design/manufacturing complex RF and mixed signal PCBs						PCB small series	embedded		x		x	x	x	x	x

MEGAHARD

TECHNOLOGY DEVELOPMENT SERVICES

Megahard is a high tech electronics design service provider. We have the capability to design in our own lab or we can provide talented trusted engineers to work at your organization.

The design service we provide can range from a PCB to a complete technology development including enclosure design and software development.

RESEARCH INSTITUTES AND UNIVERSITIES

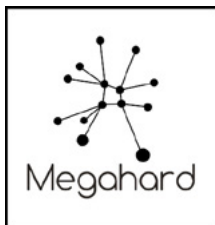
Megahard has strong roots in the scientific research world. Our specialty lies in the development of apparatus for scientific research and application demonstrators of scientific research. Megahard engineering has many years of experience in development of lab and field-ready research tools and demonstrators.

TECHNOLOGY DEVELOPMENT CAPABILITIES

- 3D designs and 3D rendering
- 3D printing/rapid prototyping
- PCB design and production
- Embedded systems programming, FPGA "programming"
- Functional testing
- Environmental testing

TECHNOLOGY SUPPORT CAPABILITIES

- Technical documentation writing
- Translating technical documentation and software: French, Dutch, English, Spanish, German
- Recruitment of specialized electronics design engineers



Georges Meinders

Sint Helenahof 15

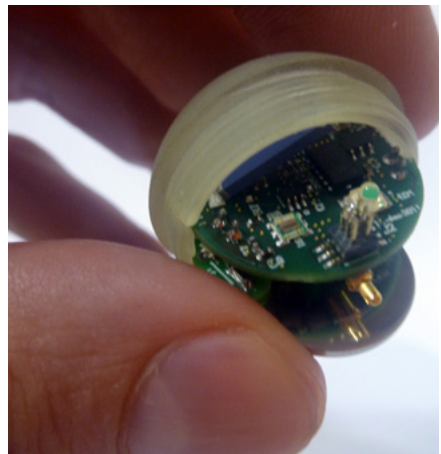
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NEWAYS

Neways was founded 1969 and has operations in Europe, Asia and the USA with a total of 2,808 employees. The operations of Neways cover the full lifecycle of professional electronics in the business to business segment, from the initial idea to development and production, repairs and service. In 2019 Neways recorded a net turnover of € 533 million.

As an international one-stop-provider in the Electronic Manufacturing Services (EMS) market, we support global players in the manufacturing industry, Original Equipment Manufacturers (OEMs) and their first-tier suppliers with tailored solutions for product lifecycle management of advanced electronic applications. We do this for electronic components, assemblies and for fully integrated (box build) operating systems.

Neways focuses on the market sectors: Automotive, Medical, Industrial and Semiconductor.

PROPOSITION

We offer our clients custom-made solutions for the complete product life cycle (from product development to after-sales service) of both

electronic components and complete (box-built) electronic control systems. Our ambition is to become the lifecycle partner and system innovator for customers. Our strategy is based on three pillars: customer intimacy, technology leadership and operational excellence.

MISSION

We offer customized solutions in close collaboration with our customers for the full lifecycle of PCBA's, cables, microelectronics and box build applications, always aiming for optimum cost of ownership.

FACTS & FIGURES

Stock Market: Euronext (NEWAY)

Founded: 1969

Board of Directors: Eric Stodel (CEO), Adrie van Bragt (COO), Paul de Koning (CFO)

Headquarter: Son, The Netherlands

Employees: 2800 (2019)

Net Turnover: 533 million euro (2019)

Locations: Netherlands, Germany, Czech Republic, Slovakia, China, USA



Neways Electronics International NV

Executive business development

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SINTECS

Sintecs was formed in 2000 as an Electronic Design Service company specialized in high-speed board design and analyses. Since that time, Sintecs has been involved in the development of high-end products in several market segments like Industrial, Medical, Telecommunications, Aerospace, Defence, etc. With our projects, we have consistently pushed forward technology boundaries.

Sintecs offers different solutions in the area of System-On-Modules development, Embedded system design and Electronic Design Services. We enable our customers to create better products that increase productivity, improve product quality, improve total cost of ownership (TCO) and provide environmental benefits.

SERVICES

Signal Integrity analysis	DFM/DFA verification
PCB design	EMC verification
Thermal analysis	Library development
Power Integrity analysis	EDA design support
Timing analysis	IBIS Resources

ENGINEERING

Product design	FPGA Design
Electronic design	Type Approval
Embedded software design	



Hans Klos

CEO

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PRODUCTS

SES-MX536	SiMC-T20x
SES-MX6S/D/Q	SiMC-LS20xx
SiMC-T10xx	SiMC-TCB01

REFERENCES

ASML – Thales – Ten Cate – Bosch

PARTNERS

Mentor Graphics – Freescale/NXP – Samtec –
Cadence



TBP ELECTRONICS

TBP Electronics is a leading Dutch integrated Electronics Manufacturing Services (EMS) company providing end-to-end product lifecycle solutions that include early involvement, Design for eXcellence, for Manufacturing and for Test (DfX, DfM & DfT), product development, procurement, pcb assembly and testing, test engineering, inspection, product- and cabinet building, repair, supply chain management and logistic services.

The name tbp defines itself as being in 'the business of perfection' and strives to provide its customers with excellence in all key areas: the race for perfection has no finish line.

Since 1976 tbp has been serving customers in the semiconductor, media, entertainment, ICT, telecoms, graphics, industrial, petrochemical, construction, shipping, broadcast, science, medical and defence sectors. With over 130 employees tbp electronics is a privately owned company with its headquarters in Dirksland in the Netherlands. Our company is officially qualified ISO 9001:2008 and AQAP 2120:2009.

For more information, visit tbp's website at www.tbp.eu

**early involvement that's...
one small step for tbp
one giant leap for manufacturing**

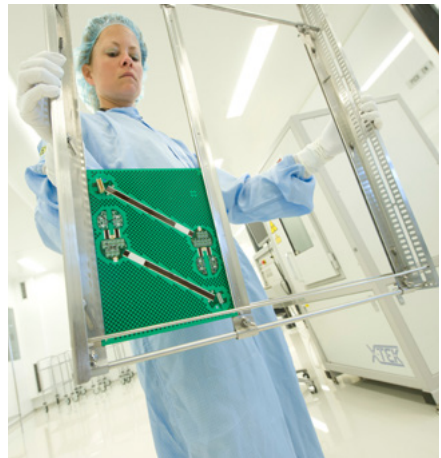


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Executive business development

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THALES GROUP COMPETENCE

CENTER FOR PRINTED CIRCUIT BOARDS

The Thales Group Competence Center Printed Circuit Boards is a low-volume supplier of high performance and high reliability complex and advanced printed circuit boards for mission critical systems.

The printed circuit board facility in Hengelo has evolved since 1969 as an internal manufacturing department within Thales Netherlands, supporting prototyping, new product introduction and technology developments for radar frontend systems. In 2012 it was appointed Thales Group Competence Center Printed Circuit Boards (GCC PCB) offering a wide range of capabilities specially tailored to the Thales Group needs with emphasis on advanced and complex RF and mixed signal printed circuit boards. Production is performed primarily for a customer base in:

- Avionics
- Space
- Defence
- High Rel Industrial applications

With respect to quality control and assurance the centre holds MIL 55110 and MIL 31032, ISO 14001 and ISO 9001 certifications and is a member of the IPC. Inspection is performed in compliance with IPC class 2 and 3 requirements. The Thales Group internal acceptance criteria: TRT 16 262

THALES

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Printed Circuit Boards**

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721 for rigid printed circuit boards and TRT 16 261 983 for microwave printed circuit boards are being implemented as part of the GCC activities. In-house reliability testing and environmental stress screening are available. Product categories and application areas include power modules, analogue boards, HDI, high speed digital multi layers, mixed signal boards, stripline flex and rigid structures, and antenna panels.

Rigid panels size up to 24x(36-48) inches and flexible layers up to a length of 10 m can be manufactured. A wide multilayer material experience ranging from FR4, PI, a large variety of RF materials (Rogers and teflons) and their combinations together with metal core materials like aluminium, BeO and AlSi and copper is present. The PCB center exhibits technical capabilities including laser direct imaging, advanced mechanical drilling and routing equipment in order to fulfil demanding registration requirements. The current lithography processes are upgraded towards state-of-the-art-fine-line capabilities. Interconnection techniques include UV/CO2 dual-source micro via laser drilling, via hole filling and over plating. Additional features like cavities, back drilling, embedded resistors and thermal management are also part of the technology portfolio. Advanced AOI, BBT testing and cross section analysis is used. Available surface finishes are HAL (PbSn), ENIG, ENEPIG, selective electrolytic PbSn, selective electrolytic Ni and hard- or soft Au and their possible combinations.



2 MECHANICAL

2.1 MACHINING OF BIG PARTS

MACHINING OF BIG PARTS	Company size	Speciality (USP)			Area							Service	Test & Measurement						
														Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)			
		Metal		Software															
									Large	Small	Mechat.						Cyo	Vacuum	Electronics HW
Technical consultancy	Systems Engineering	Project Management																	
Bayards Aluminium Constructions	M	machining; joining	050401; 06	complex aluminium constructions	x	x			x										
Schelde Exotech	M	construction; repair of reactors and vessels	050401; 050402; 060102	engineering and manufacturing special materials	x				x				x		x				
Van Halteren Metaal BV	M	systemsupplier; machinery; structures	0504; 0590; 060102	general precision machining and assembly	x	x	x		x			x		x	x				

BAYARDS ALUMINIUM CONSTRUCTIONS

Thanks to 50 years of experience in designing and manufacturing high-quality complex Aluminium structures, Bayards has become one of the most ground-breaking construction companies in Europe, establishing itself as an industry leader while gaining international momentum with each project.

PRODUCT INFORMATION

With our innovative approach to design, fabrication and assembly of complex aluminium products, we have the expertise and the capability of working on projects with very specific requirements. The solutions we offer are tailored specially to our customers needs, engineered and built in accordance with the latest international safety regulations and highest quality standards.

BAYARDS PRODUCTION CAPABILITIES

- High speed profile milling machine
- Friction stir welding machine
- Gantry machine
- High speed milling machine

With our state of the art equipment, the possibilities are limitless.

REFERENCE

A remarkable example of our work is manufacturing components for the Cern's newest generation of practical accelerators (LHC) which are used for fundamental scientific research. This project was ordered by the European Organization for Nuclear Research (CERN - Conseil European pour la Recherche Nucleaire).

It involved precision machining, orbital welding, x-ray, vacuum- and helium leak-testing. Like all our projects, this too was completed to the full satisfaction of our very demanding client.

Please visit our website for more information and track records.

BAYARDS®
solutions in aluminium

Ing. Dies W.S. Mackintosh

Managing Director

Veerweg 2

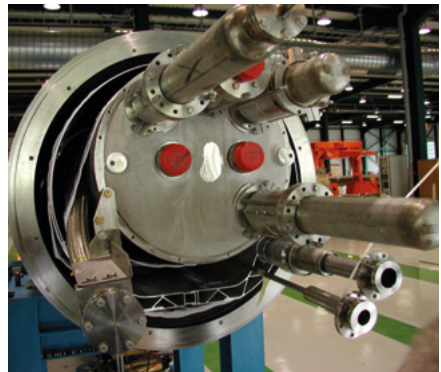
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Turnover: 25 M€ | 135 employees

www.bayards.nl



SCHELDE EXOTECH

HOW WE WORK AND THE INDUSTRIES WE WORK WITH

Schelde Exotech is a highly qualified and reliable manufacturer of industrial equipment. In accordance with strict quality standards, we design, manufacture, test and maintain advanced products that exactly meet our customers' requirements and specifications. Schelde Exotech is active for many high-tech industries.

At Schelde Exotech, every product or series that we produce is a one-off. We can only produce these items in the best possible way in close collaboration with the companies we work for. We feel privileged that many well-known companies have become loyal partners. In every job, our customers are closely involved in the process and can rely on our promises

at every stage of production and at every level of the business. Most of our customers are active in the energy, nuclear, chemical and petrochemical, scientific research and particle physics markets.

REFERENCES

Saudi Aramco, CERN, ASML, Shell, Dow, YARA



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VAN HALTEREN METAAL BV

Van Halteren Metaal BV is part of the Van Halteren Group, an independent family owned business with various facilities in and outside The Netherlands. We aim for multidisciplinary projects where competences as advanced heavy machining, certified welding, assembly and commissioning are a requirement. Our production facilities comprises 12.000 Sqm., equipped with modern machinery and construction shop. Our staff is motivated, skilled and very experienced.

MARKETS

VHM serves a large variety of markets: Offshore, Big science, Shipbuilding, Defense, Sustainable Energy, Semi-conductors.

COMPETENCES

We manufacture components as well as complete assemblies

- Advanced machining 3-4-5- axis up to 20 meter
- Certified welding, ISO 3834-2, NEN EN 1090-2.
- Project management
- Assembly, Integration & Commissioning
- Engineering & development
- Quality assurance & control
- Electro-mechanical assemblies

EXPERIENCE WITH CERN, HFML, ITER, ESRF, ESA

Magnet housings, MQFXB magnet parts, special tooling, components

PRODUCTS

- Mechanical components
- Mechatronic assemblies
- UHV components
- Simulators systems
- High voltage switches



Jeroen Kleinlugtenbelt

Sales Manager

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www.vanhalteren.com





2.2 MECHANICAL

PRECISION MACHINING
(HIGH SPEED MILLING, TURNING, ELECTRO
FORMING, EDM)

[illegible]

BAKKER FIJNMETAAL

COMPANY PROFILE

Bakker Fijnmetaal BV – development and manufacturing of ultra-precision parts and assemblies. Bakker Fijnmetaal concentrates on cutting technology based from proto up to high volume production with a far-reaching qualification standard.

The completely automated machinery guarantees short lead times and cost-efficient production. Materials used include copper, brass, stainless steel, aluminum, titanium and various plastics.

Bakker has an assembly hall and a clean room, class 10.000 where experienced professionals carry out assembly work. All the means required to clean and assemble products are in house available.

To develop customer-specific products, Bakker Fijnmetaal uses Hypermill CAM software. Bakker Fijnmetaal is able to assist from idea, new product introduction (NPI), DFM (Design for Manufacturing) up to release for volume (RFV).

From 1 to 10.000 pcs, parts and assemblies!



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5692 AH Son
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www.bakkerfm.nl



FMI HIGHTECH SOLUTIONS / FMI MACHINING

FMI HighTech Solutions is part of the FMI Group, with 8 companies, located in the South of the Netherlands. FMI HighTech Solutions designs, produces and assembles complete mechanical and mechatronic devises and complex modules.

COMPETENCES

Vacuum Technology, Motion, Optical, Precision Technology, Transport tooling, Material Handling, Production of High-end parts, 3-D printing, Project Management

PRODUCTS

Production of high-end parts (0,003micron), High-end modules, Tooling equipment.
Proto-typing and volume production.

QUALITY

- ISO9001 QMS, ISO13485
- Loyd's certificate Of re-marking
- Full traceable product document management
- Compliance & Risk management
- Advanced Product Management

MARKETS

Aerospace – Analytical – Leisure industry – Medical – Food – Oil & Gas – Semi-conductor – Solar.

REFERENCES

Anteryon – Applikon – ASML – FEI – JenOptik – Thales – Twister – Vekoma



John in 't Groen

Business Development Manager

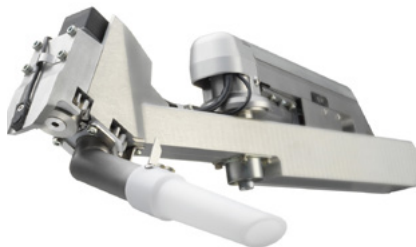
Liessentstraat 9-C

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KUSTERS & BOSCH

FIJNMECHANISCHE INDUSTRIE BV

We make precision parts and assemblies.

With a small enthusiastic team, a very modern machine park and over 25 years' experience in the making of machined precision parts we aim at a profitable and long lasting relation with our customers.

SPECIALTIES

- Precision (micron area) parts in all sorts of materials and (sub-) assemblies.
- Parts for vacuum applications.
- Series production

CAPABILITIES

- Modern precision 5-axis milling up to 2000x 800x750 mm milling.
- Acclimatised measuring facilities with table size 1200x2000x1000.
- Experienced & enthusiastic team of 35 people.
- Used to work for large organisations.



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www.kusters-bosch.nl



LANDES HIGH END MACHINING

Reliable supply of mechanical parts ready for assembly is the core competence of Landes High End Machining. Landes incorporates 30 years of experience in the manufacturing and on-time delivery of complex and/or accurate components for high end industries.

Products are realised by means of CNC-turning, CNC-milling and CNC-measuring. This privately owned business was established in 1985 and has demonstrated consistent growth in turnover and technology development over the years. Landes currently employs approx. 50 employees and is both ISO 9001 and AS-9100C certified.

CAPABILITIES

The capabilities within Landes range from the industrialisation of new components and qualification of manufacturing and outsourcing processes as well as high end machining of titanium (all grades), aluminium and high alloy steels. Manufacturing activities may include special processes like heat treatments, surface treatments, finishing and cleaning with the aim to deliver components that are ready for next higher assembly. The dimensions of Landes in-house manufacturing go up to 1000 x 1000 x 1000 mm. Documentation and traceability are an integral part of the quality management system within Landes.

PRODUCTS

Structural parts, precision components, turbine components, landing gear components, interior components, frames, housings, limiters, rotation parts, pick- and place components, etc.

MARKETS

Aircraft- and Space industries, Defence (land systems, naval systems, air bound systems), Semicon industries, Optical industries, Medical equipment, Offshore industries, Special machinery.

REFERENCES

Fokker Airbus – Marshall Aerospace – General Electric – Stork – Pratt & Whitney – VDL – Siemens – Fresenius etc.

CERTIFICATION

ISO-9001, AS-9100C



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www.landes.nl



MEVI MEANS PRECISION WITHOUT COMPROMISE

Accuracy is Mevi's strength. Accuracy in everything from engineering to system supply, module construction, machining and test equipment. We can measure up to an accuracy of 0.6µm, and drill holes measuring just 0.02mm. That's Mevi for you.

Our expertise is evident in every part of our company, from our extensive range of machinery to our over 100 specifically trained FTE's. It's thanks to all of these resources that Mevi has become a medium-sized partner with the capacity, knowledge and experience of a major player. But also one with the adaptability, determination and personal involvement of a small-scale organization. What this means in practice is that Mevi works extremely accurately, flexibly, and without compromising on quality. What's more, we like to taking on any challenge, regardless of its complexity. Whatever the challenge, we will build it.

MEVI SPECIALISES IN:

- Engineering
- Production
- System supply
- Test equipment
- Automation of 3-R pallet system (in combination with FEHLMANN P95)
- 5-axis range Ø 160 x 160mm
- Speed of 50,000 rpm

Three machines; countless solutions
We will be happy to show you three of the machines that we're most proud of. However, these are only a few examples of all the machinery and technology at our disposal.

FEHLMANN VERSA 825

- 5-axis milling within 5µm
- Range Ø 500 H = 430mm
- EROWA automation system with 6 pallets of 400 x 400mm
- Speed of 20,000 rpm

KERN PYRAMID NANO

- Hydrostatic
- Mills to 1 µm, with repeat accuracy of 0.3µm
- Surface roughness of up to Ra 0.05µm achievable

LEITZ PMM-C

- Calibrated to 0,6µm
- Range 800 x 1000 x 600mm
- Programmable with PC-DMIS



Anthony van Zeeland

Engineering Account Manager

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www.mevi.com

Interested in finding out how we can help you? Please contact us to discuss your requirements.



NIJDRA GROUP

ABOUT US

Nijdra Group is a professional supplier of fine mechanical parts and mechatronic modules meant for the high-tech industry. Nijdra Group is a third generation family business (since 1947) and unburdens its clients with co-engineering, production and assembly. Thanks to the wealth of experience in the high-tech industry, we can offer added value in each phase – from development to final product.

CO-ENGINEERING

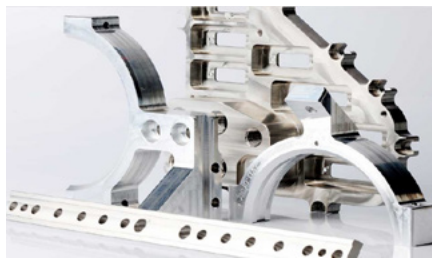
With co-engineering, we think along with the client in an early stage of design. We use our sector experience to find the most optimal solution for the manufacturability and reproducibility of parts and assemblies.

PRODUCTION

From prototyping to serial production of fine mechanical parts, CNC turning/milling/grinding. This is realised through highly automated and robotised machine factories with little human labour involved (low volume, high complexity, low costs). We also have experience with clean production and the production of oxygen free copper parts.

ASSEMBLY

For the OEM clients, the mechatronic modules are completely assembled and tested. All chain concerns are taken away, so that OEM clients can focus on unburdening their end customer.



Robbin van Zanten

Accountmanager

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PRECISION MECHANICAL PRODUCTION

Precision Mechanical Production is a flexible and innovative supplier, specialized in manufacturing of ultra-precision mechanical components for the High Tech industry.

COMPETENCES

- Since its foundation in 1998, PMP works proactively with customers in both the product development and the product realization process.
- Knowledge and Skills at the highest level of;
 - developing product- and process strategy
 - tool design and development
 - CAD/CAM
 - CNC machining
 - Aukom coordinate measuring technology (3D)
- An installed base of the latest machine tools at the forefront of technology;
 - 3-axis (max.2000x800mm) CNC machines
 - 5-axis (max. cube 600mm) CNC machines with loading robot
 - 3D measuring facility.
 - technical climatized production.

- Producing accurate, complex ultra-precision parts, with tolerances in the uM range.
- From prototype, single pieces to small and medium size series.
- Materials; aluminium, titanium and super alloys.
- The active quality assurance policy together with our safeguarded processes and procedures ensure our high quality to be continuously secured.

MARKETS

Semicon – Analytical – Optical – Medical – Defense and Aerospace.

PMP your “Partner in Precision”



Eric Sens

COO

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www.pmp-nl.com



VDL ENABLING TECHNOLOGIES GROUP

VDL Enabling Technologies Group is a globally operating tier one contract manufacturer of parts, mechatronic modules and systems. VDL ETG focuses on long term / strategic partnerships with its customers.

PRODUCT INFORMATION

VDL ETG provides solutions based on its core competences: Precision Technology, Vacuum, Material Handling, Material Positioning, and Industrialization. This throughout the entire product life cycle: basic research, proto typing, ramp-up, volume, and end-of life.

PRODUCTS

Mono parts, complex high-end modules, complete (mechatronic) systems.

MARKETS

VDL ETG serves a number of OEM industry key segments: Semiconductor Equipment, Analytical, Medical, Solar, LED, and Science & Technology. Science & Technology

VDL ETG is specialized in the (co)development and manufacturing of high precision parts, sub-assy's, complex modules. All products require high / ultra precision turning & milling, high-end metrology, bonding, RF testing, and heat & surface treatments. The defined production strategy determines yield, cycle time, and cost of ownership. Our strength is to rapidly translate highly innovative, complex product designs into tangible products ready to enter small series production. Typical key markets within Science & Technology: normal conducting (X-band) accelerator, FEL, astronomy, optics communiation, earth observation.

REFERENCES

Semiconductor Equipment: ASML, AMAT, KLA, ONTO, ASMI. Analytical: KLA, Thermo Fisher. Medical: Philips, Elekta. Solar & LED: AMAT, Veeco. Mechanization Projects: P&G, Kellogg's, Bosch. Science & Technology: ESO, ESA, TNO, PSI, CERN, DESY



Cees Coolen

Business Manager Science & Technology

Hans Priem

Business Manager Science & Technology

De Schakel 22, 5651 GH Eindhoven

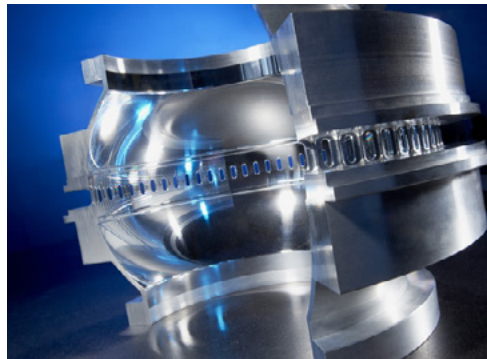
T: +31 (0)40 263 88 88

E: cees.coolen@vdlletg.com

E: hans.priem@vdlletg.com

Turnover 2019 >€700M | 3000 employees

www.vdlletg.com



VERMEULEN METAAL BV

Vermeulen Metaal BV is your One stop shop for specials

ENGINEERING

- Solid works
- Inventor

MANUFACTURING

- Sheetmetal (all materials)
- CNC milling
- CNC turning
- CNC boring
- Piping (water, gas and chemical)
- Skidbuilding
- Certified welding

ASSEMBLY

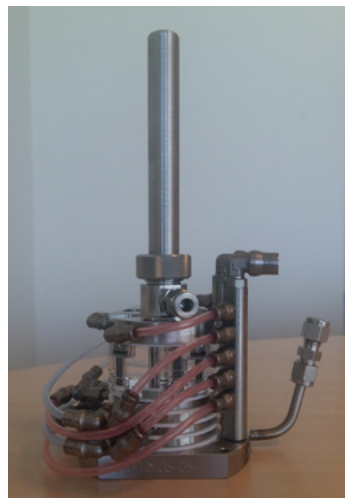
- machine building
- machine parts
- on-site installation

REFERENCES

OMT solutions – Cosign – Permobil France – Perfetti
van Melle benelux – Solvay chemicals – Viro –
Alstom – WML

CERTIFIED

- ISO 3834-2
- ISO 1090-1
- ISO 9001 (under construction)



Vermeulenmetaal BV

Peter Vermeulen

Director

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2.3 MECHANICAL

GENERAL MACHINING

GENERAL MACHINING	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	System Supplier R&D	Development	Engineering	Production / Assembly	Test & Measurement	
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal																
					Large	Small	Mechat.	Cryo	Vacuum	Electronics HW	Software										
AJB Instruments BV		machining; assembly	050404	high precision components	x														x		
Betech Mass Turning	S	machining	05	large series turning	x	x														x	
Boessenkool	S	systems; machinery; structures	0504; 0590	general machining and assembly	x	x	x							x		x	x	x			
Bouman Machinefabriek		systems; machinery; structures	0504; 0590	general machining and assembly	x	x	x							x	x		x	x	x		
Germefa		mechanical parts and systems supplier	0504; 0590	general high precision machining	x	x	x	x	x								x		x	x	x
Geurtsen Machinefabriek	M	mechanical parts and systems supplier	0504; 0590	high precision machining; 3D Metal printing; welding		x								x			x		x	x	x
IGS GeboJagema		machining large and small series	0504	high precision and moulds; engineering	x	x										x			x	x	
Wilting	S	ultra high vacuum and cryogenic systems	0504; 06	high precision manufacturing	x													x	x		
Witec		product development high mix; low volume	0207; 0209; 0225; 05	high precision machining, motion control, pilot factory			x									x	x		x	x	x

A.J.B. INSTRUMENT BV

Over the past several years AJB has developed itself as a specialised supplier of high precision components and small assemblies to many high tech industries.

Technical and commercial support combined with advanced production facilities allow us to satisfy almost every customer's demand. In our facility we have everything from conventional lathes to 5 axis CNC milling machines with automation and 13 axis CNC lathes. We also offer additional process capabilities of grinding, wire erosion, honing, lapping and a cleanroom assembly facility. An environmentally controlled measuring room with 2 CNC measuring machines ensures the highest accuracy and reproducibility of your product.



IJsbrand Dijkshoorn

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www.ajb.nl



BETECH MASS TURNING

The strength of Betech Mass Turning lies in the production of large series of turned goods. Complex micro turning and high precision parts, all in great quantities.

AN EVOLUTION IN INTELLIGENT PRODUCTION!

Located in the Netherlands, Betech is a leading European producer of large series of turned and mill-turned goods. Annually we produce tens of millions of custom made parts in all metals, for all kinds of customers worldwide. As the fully automated and innovative machining expert Betech supplies multiple industries, varying from automotive industry to high tech industry.

- Great Production Capacity
- Quality Documentation
- Short Delivery Times
- Surface Treatments
- Mass Production Expert
- Strategic Partnership

UNMANNED SERIAL PRODUCTION

Betech operates 24/7 of which 80% is unmanned with fully automated and especially intelligent production techniques. The machinery consists of over 100 CNC-, mechanical-, and hydraulically controlled lathes, multi-spindles and transfer machines for turning and mill-turning. Our innovative manner of production results in a labor added value of 15 to 20% per product and therefore a highly competitive price level. We are specialists in a specific Ø-range of 0,8 to 69 mm from bars and tubes.



Arjan Schuinder

Sales & Marketing

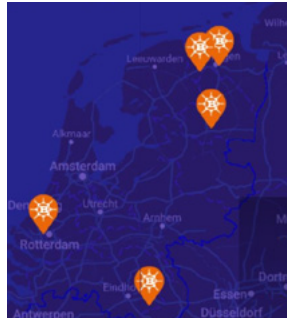
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BOESSENKOOl

Machinery Manufacturer Boessenkool: knowledge, competence and facilities. Co-maker mentality. Pro-active thinking and handling. Based on a complete knowhow and service mentality. Engineering, steel structures, metalworks, mounting facilities and mechanical machining. When needed also supplied with controls, electronics and final treatment. For that reason "Made by Boessenkool" is a guarantee for quality and success to many of our customers.

PRODUCT INFORMATION

Product	Description	Customer
Beampipe Bake Out Shell	Beampipe for electrons, matter research	CERN (CH)
Revolver Mobile Undulator Carriage	Electron fibrillation tool , matter research	E.S.R.F. (FR)
Galacsi Structure + Graal Tools	Alu structure to mount mirrors for space research	E.S.O. (D)
Product & Utility Swivel	Off-shore FPSO (Oil Production & Storage Unit)	Bluewater Energy Services (NL)
Rotary Bottle Filling machine	Bottle filling machine for the food industry	Stork (NL)
Compression Piston Rods	Piston Rod for high pressure compressor	Thomassen Compression (NL)
Rollers & Shaft for Test Bench	Rollers & Shaft of a testbench for trucks diam. 5 mtr.	Froude Hofmann (GB)
Warehouse Stacker Crane	Order picking unit for warehouses upto 40 mtr. height	FKI Logistex (World Wide)
Vacuum Vessel	Vacuum vessel for Wafer-Stapper production	ASML (NL)
Bearings & Gears	Bearing & Gear for Windmills upto 4 mtr. Diam.	Siemens (D) / Flender (D)
Services	Description	Max. weight
Milling	Upto 10 meters to 4 meters to 2 meters	60 tons
Boring	Upto 10 meters to 4 meters to 2 meters	60 tons
Turning	Upto 6 meters length with a diameter of 1 meter	20 tons
Vertical Turning	Upto 5 meters diameter with a height of 4 meters	60 tons
Fabrication	To customer specifications	120 tons
Welding	Certified welding in all materials and thicknesses	120 tons
Machine-building	Hardware incl. electronics, pneumatics and hydraulics	120 tons
Assembly	Products upto 60 meters with weight upto 120 tons	120 tons
Project-management	Projectmanagement incl. traceability	
Powder coating	Upto 4 meters long	
Hoisting	Hoisting capacity inside the factory is 120 tons	Max. 120 tons



Ing. Eelco M. Osse

CEO

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E: info@boessenkoolbv.nl

Turnover: 5 M€ | 40 employees

www.boessenkool.com



Revolver Mobile Undulator Carriages for the E.S.R.F. in France. Repeating Parallelism tolerance between the beams is 0,05 mm over 2,5 meters incl. beam rotation.



Large Welding constructions including the Large Machining against small tolerances in just one factory!

BOUMAN MACHINEFABRIEK BV

Our well thought-out working methods are recognizable in everything we do.

Machine fabriek Bouman BV is supported by its own Engineering Department, to manufacture complex projects and products. Excellent planning and Project Management through one contact point makes it possible that our cooperation is perfect and trouble free. Pick up the phone and contact Machine fabriek Bouman BV

POSSIBILITIES

- Engineering
- CNC turning and milling
- Welding and sheet metal working (Carbon steel and Stainless steel)
- Assembly special machines and modules

UNISIGN UNIPORT 6000

- 4-5 axis CNC milling + drilling machine
- x-axis : 8000 mm
- y-axis: 2500 mm
- Z-axis: 1000 mm
- table: 8000x2170 mm
- CNC table: Ø 2000 mm
- Free space portal 2500(y) x 1200(z)

THE MATTER IN HAND



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GERMEFA

Greater precision provides countless new opportunities, whether noticeable or not. A good example of this is insect robots. For over a decade, scientists have worked on these minuscule robots, and now these robots, which weigh less than a gram, are ready to take to the skies.

The applications are numerous; think of, for example, their possible use in disaster areas. That the production of these minuscule robots became possible, is due to recent breakthroughs in the fields of manufacture, design and materials. Manufacturing precision played an essential role in this development, needless to say.

The greater the precision and the higher the quality demands, the more we like the challenge at GERMefa. We are continually striving to guarantee and further improve this accuracy and quality. This cannot be achieved overnight; we have been working on this process for decades.

Our precision and quality make us the perfect partner for companies in demanding markets, such as the medical/optical industry, aviation and aerospace as well as measurement and control.

As part of the stock market listed Aalberts Industries, we can also take over the entire production process for components, by integrally outsourcing other types of processing to our sister companies, for example, heat and surface treatments, deep hole drilling, engineering, casting processes, punching and vacuum brazing. This way, you retain one point of contact, but you benefit from all the processing options and expertise available within Aalberts Industries.

GERMefa is also part of the Micro Machining Group, a group of suppliers of complex precision mechanical components and assemblies. See www.micromachininggroup.nl/en/

How can we contribute to your next great advance?

MARKETS

Medical/Optical – Aviation and Aerospace –
Oil & Gas, Science – Defence – Automotive –
Measurement and Control

CERTIFICATION

ISO-9001-2008, ISO 13485



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Sales Manager

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www.germefa.nl/en/



GEURTSSEN MACHINEFABRIEK

Combined expertise: at Geurtsen we know better than anyone that complex technical issues call for targeted solutions. That is why we put the concept of 'combined expertise' into practice in every possible way.

SPECIALISTS IN MACHINE CONSTRUCTION

With its own design department, extensive and modern production facilities, and about 100 skilled employees, Geurtsen is able to develop and produce solutions for many technical problems. Our technical service department has about 30 service technicians to provide servicing, maintenance and repair at our customers' locations.

COMPETENCES

- Engineering
- CNC-milling (5-axis)
- CNC-turning
- Construction piping and skids
- Machine building
- Turnkey installation on location
- Service and maintenance
- Industrial supply
- Prototyping
- 3D Metal printing
- ISO 3834-2 certified welding MIG, TIG, Orbital
- NEN-EN 1090 certified constructions
- VCA (SCC) certification
- Organisation: ISO 9001:2015 certificate

MARKETS

- Industry process
- industrial supply
- food, pharma
- industrial services



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IGS GEBOJAGEMA

IGS GeboJagama, for over 65 years, we have been delivering high precision. Parts and moulds for some of the most successful products and industries. Many of the key players in the industry bring their toughest product challenges to IGS GeboJagama. That's because we provide the solutions they need to help them innovate new products.

Our problem-solving mindset, proven track record in high precision machining experience and meticulously methodical way of working ensures you the highest quality, process control and traceability needed for your products.

WHAT MAKES US DIFFERENT

Proven track record and know-how to help you push the boundaries on high precision parts and create new innovations

- Engineering power that helps you make seemingly impossible components, quickly and cost-effectively

- Design for Manufacturing support to improve the Manufacture ability of your products
- Meticulous process control of quality, validation and traceability to meet the strict standards for high precision parts
- High volume capabilities to produce small series multiple parts at once to meet high volume requirements and leverage economies of scale
- Financial stability as part of a large and solid group, that guarantees secure support during the entire lifetime of your product
- After sales support to offer a full warranty on all our products to guarantee a long productive lifetime.



eye for precision

Jan-Willem den Hollander

Business Development Manager

Esp 430

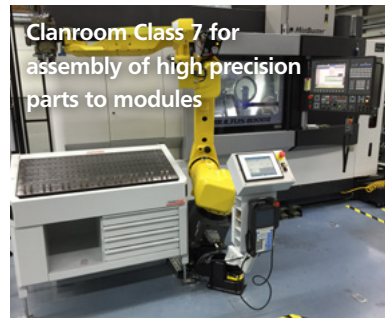
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WILTING

Wilting is your international partner for the industrialisation and production of high-quality precision components, assemblies, and assembled components. Wilting has been a supplier in the high-tech industry for over 30 years. Our customers are European OEMs that compete globally, Universities and knowledge institutions.

Based on our vast experience in machining Wilting developed into **“Specialists in Manufacturability”**. Therefore, we want to be involved during the engineering phase of your products. In order to be committed during the industrialisation and production of your high precision complex components and/or modules. This enables our customers to focus on innovation & development, and sales & service.

WILTING'S CORE COMPETENCES

- Specialists in high-precision components
- Outsourcing the production of your high-precision components to Wilting means quality assurance during production and competitive prices due to 24-7 low-manned production.
- Specialists in assembly and supply chain management

- Have Wilting take care of your assemblies and supply chain management and you will experience flexibility thanks to project-driven or process-driven assembly (if required in a well-equipped cleanroom).
- Specialists in value chain management
- Let Wilting take responsibility of your assembled parts (parts that require a series of different production technologies like milling, welding, brazing, cleaning, etc) and you will benefit from unique innovative solutions through cooperation with a strong network of compatible partners. Furthermore Wilting will engineer an optimal production chain due to a multidisciplinary approach in the process design.

MARKETS

Semicon Equipment – University and science –
Aerospace – Food processing equipment.



Adwin Kannekens

Sales director

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www.wilting.eu



Through innovation and cooperation, we enable our clients to distinguish themselves sustainably and to lead the way in their market. We develop, manufacture and sell technologically-innovative products and assemblies, in the fine mechanical technological industry, which are manufactured in repeat production.

Together with our clients, we come up with a fitting solution for technological issues at any level. From simple components to custom-made solutions. We aim to build a long-term relationship with our customers.

TOGETHER WE CREATE THE TECHNOLOGY OF THE FUTURE

Because we are active in different markets, we can apply our acquired knowledge in the manufacture and development of new products. This unique market position makes us the focal point of innovation. By sharing this knowledge with our customers, we help them profit from new opportunities in the market, making Witec a partner during the entire life cycle of a product and/or system.

Constant innovation, optimum processes and modern production facilities enable us to position ourselves as a reliable partner for the long term, with quality and performance at the centre.



Stelmaker 7
9502 EG Stadskanaal
T: +31 599 58 80 10
E: info@witec.nl
www.witec.nl

Our unique process approach allows us to see each product as a unique representation of a combination of production processes.

We have a worldwide network of suppliers at our disposal which meet all of our quality guidelines. Witec is ISO 9001:2015 and ISO 13485:2016 qualified.

LET'S INNOVATE TOGETHER

Witec development is a service provider in the development of new products that are manufactured industrially.

We seamlessly link 'what to make' to 'how to make', creating value from the very first product idea.

- Innovation management
- Project management
- Pilot factory

Witec Precision manufactures on micron-accuracy with ultra-clean parts due to our applied processes and high-tech equipment.

- High mix, low volume – high precision
- UCV (Ultra clean vacuum)
- Standard dimensional accuracy of the production process ± 0.03 mm

Witec motion specializes in the development of mass production and assembly of high-tech systems for various applications.



2.4 MECHANICAL

GEOMETRICAL MEASUREMENT

GEOMETRICAL MEASUREMENT	Company size	Speciality (USP)										Area										Service																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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CARL ZEISS INDUSTRIAL METROLOGY

A CNC coordinate measuring machine (CMM) is only as good as the information it provides. Information that can save time by improving processes, save money by reducing scrap, and help in the production of high quality parts. Carl Zeiss is a leader in CMMs and complete solutions for multidimensional metrology in the metrology lab and production. The company is a recognized partner to the high-tech industry and its suppliers.

The offering encompasses bridge-type, horizontal-arm and inline measuring machines, as well as form, contour and surface measuring machines. All relevant modules, such as controllers, software, measuring systems and sensors are developed and manufactured in-house. This total system design results in precision of your metrology equipment and accurate results.

Recent new developments include a system to measure extremely small parts and a computer tomograph for industrial quality assurance. With its optical and tactile measuring systems, Carl Zeiss has added image processing to the application spectrum of coordinate measuring technology. Synergies have been used to create optical sensors and optimized software. The extensive CALYPSO software library enables users of ZEISS measuring technology to perform almost any measuring task.

The offering is rounded off with extensive customer services, contract measurements, part inspection using computer tomography and services to ensure optimum machine uptimes.

Albert Drenth

Business Unit Manager

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www.zeiss.nl

PRODUCTS

Systems: Precision metrology products, including CMMs, surface & form, CT, optical, and more.

Software: Measuring, evaluation and management software to increase the performance of your measuring operations.

Sensors: Contact and optical sensors, even for the most sensitive surfaces. From VAST active scanning to laser to RDS articulating.

Accessories: Fixturing, styli & accessories, and system-specific options.

SERVICES

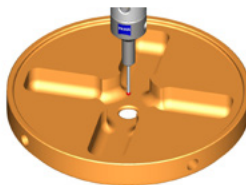
Software/Hardware Services: Services for your CMM to ensure highest reliability and performance.

Training: Trainings for measuring software, statistic and reporting software and more.

Measuring Services: Contract measurements, calibration and contract programming in our Benelux Measuring House in Best.

METROLOGY SOLUTIONS

Automotive –
Machinery – Aerospace
– Medical – Energy –
Plastics



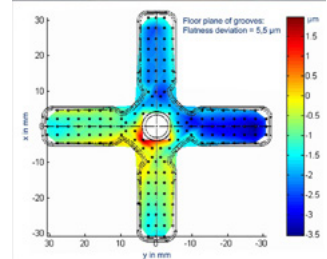
IBS PRECISION ENGINEERING BV

For over 20 years IBS Precision Engineering has been helping its customers to realise their demands for measurement, positioning and motion systems where ultra-high precision is required. With our expert foundation in metrology, we understand the true meaning of precision and how to help our customers achieve it.

IBS products and solutions can be found at leading companies world-wide serving industries from disk drive to semiconductor equipment, printing and medical systems. In the field of machine tools we serve both builders and users with measurement systems delivering significant bottom-line productivity improvements. For the research community, we provide support from standard ultra-precision components to custom made systems.

At IBS we have a long history in successfully helping our customers address unique problems. We do this through both our standard products as well as our design house. The latter provides support from feasibility through to pilot production for modules through to machines.

From advice on component application to full system design and realisation, our aim is to deliver the innovative solutions required by our clients where leading measurement or high accuracy motion capability is critical.



Dirk Smits

Sales & Marketing Director

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www.ibspe.com

Mitutoyo's history began with the establishment of a research center to produce Japan's first micrometers in Tokyo's Kamata district by Yehan Numata in 1934.

The founder of Mitutoyo Corporation was born on April 12, 1896 in Hiroshima. He was born into a Buddhist priest's family as the sixth of eight children. His family lineage had been made up of Buddhist priests since the 16th century.

Mitutoyo's philosophy has been 'to contribute to the wellbeing of society through precision measurement technologies.' Under this guiding principle Mitutoyo has expanded into global markets as a comprehensive manufacturer of precision measuring instruments.

PRODUCT RANGE

Mitutoyo has been a manufacturer and seller of a complete range of precision measuring instruments for many years. As a key player in the global metrology market, Mitutoyo's products range from small hand tools (micrometers, calipers, etc.), to scales, sensors, objective lenses, microscopes, hardness testing machines and large measuring applications, like Form-, Vision and Coordinate Measuring Machines (CMMs).

With these metrology instruments and our data management solutions, we give our customers more insight in what they manufacturer, so that they can control their production processes and improve the quality of their products.

QUALITY, EDUCATION AND RESEARCH

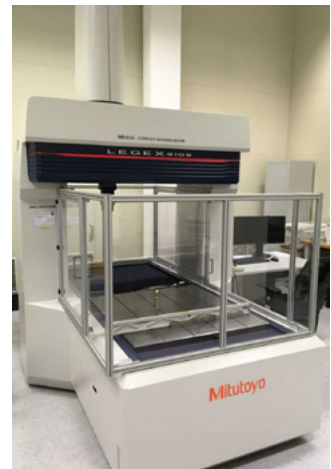
To guarantee the quality of Mitutoyo's products, most of its local Sales and Service Offices have a calibration accreditation. Mitutoyo Benelux has an ISO 17025 accreditation since 1994, under the guidance of the Dutch accreditation council (Raad voor Accreditatie).

Mitutoyo's Institute of Metrology (M.I.M.) ensures that also the metrology knowledge remains up-to-date and is available for the market in the form of Education Packs. Additionally Mitutoyo also has research laboratories around the world, of which Mitutoyo's Research Center Europe (MRCE) is located in the Netherlands.

Mitutoyo

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XPRESS PRECISION ENGINEERING BV

Xpress Precision Engineering develops and commercializes ultra-precision metrology solutions. Our core business consists of two product lines.

First, we develop and sell products for precision coordinate metrology. This includes 3D tactile probes, controllers and nano CMMs. Secondly, we offer ultra-precision engineering services where we develop solutions for a wide range of customers, e.g. (metrology) institutes, universities, high-tech industry and manufacturers of metrology equipment. Projects usually are a combination of precision engineering and metrology / sensors / measurements.

ULTRA PRECISION METROLOGY SOLUTIONS

A good example of our capabilities is our TriNano coordinate measuring machine (CMM). The N100 model achieves a repeatability of 2,4 nm and a volumetric 3D uncertainty of 100 nm, making it one of the most accurate 3D metrology tools available. The innovative design results in a cost-efficient and highly stable machine that is capable of high speed scanning measurements. This makes TriNano the first nano CMM that is ready for industrial applications.

Furthermore, we offer various 3D scanning tactile probes. Our flagship probe, the Gannen-XP, has a 2 nm repeatability in any direction and a combined 3D uncertainty of 50nm, which makes it the most accurate 3D probe on the market. Additionally, Gannen probes can measure with spheres as small as 50 micrometer in diameter and can achieve micro Newton probing forces. The latter enables a user to measure even soft materials in true 3D without damaging them. All our probes are compatible with various CMM brands.

ULTRA PRECISION ENGINEERING SERVICES

Xpress provides advanced design and engineering services related to metrology and high-precision positioning for our customers. Customers range from global companies to start-ups and small businesses. We solve your challenge, from initial concept to prototyping, calibration and turn-key delivery.

We are specialized in: metrological design, precision mechatronics, kinematic design, opto-mechanical design and controller design.



Ernst Treffers

Director Business Development

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*ultra precision
metrology solutions
&
engineering services*

The background features a dynamic, abstract composition of golden-yellow particles and light waves against a dark, almost black, backdrop. The particles are arranged in dense, flowing patterns that resemble ripples or waves, creating a sense of movement and depth. A semi-transparent rectangular box is centered in the upper-middle portion of the image, containing the text.

2.5 MECHANICAL MECHATRONICS

www.bigscience.nl

MECHATRONICS	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	System Supplier	R&D	Development	Engineering	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal		Gyro	Vacuum	Electronics HW	Software											
					Large	Small					Mechat.										
Airbus Defence and Space Netherlands	M	systems engineering; space	0504; 0590; 0350; 04; 06	system supplier; remote handling		x	x			radiation hard	x	x	x			x	x	x			
Butraco	S	projects for mechanical development	05; 06	prototyping; consultancy; business development	x	x	x	x	x			x	x	x			x	x			
Demcon Advanced Mechatronics	M	broad systems supplier	05; 03; 08	engineering; prototyping; manufacturing			x			x	x	x	x			x		x	x	x	
Heinmade	s	piezo actuators; drivers and controls	0207; 0209; 0210	custom designed motion control systems			x			x	x		x	x				x	x		
INDOLES Precision BV	S	platform for precision-positioning applications	05	meeting users and suppliers for accurate positioning			x							x			x				
PM-Group	S	hi-precision stages and motion control	05; 050107; 050404	precision machining, system supply, engineering		x	x									x		x	x	x	
Q-sys	S	motion control and positioning systems	0207	customized engineering and manufacturing			x			x	x					x		x	x	x	

AIRBUS DEFENCE AND SPACE NETHERLANDS

Airbus Defence and Space Netherlands BV is a supplier of high-tech products and services for the international aerospace industry. Since its founding in 1968, the company has contributed to many challenging space programs and has built-up considerable expertise in space technology in areas such as Earth observation, telecommunications and science. The Dutch organization is part of Airbus Defence and Space, a division of Airbus Group. The portfolio of Airbus Defence and Space Netherlands BV, which employs more than 200 experienced professionals, includes solar arrays, launcher structures and instruments & systems. The company employs more than 200 experienced professionals.

Some examples of relevant achievements for Space and Science are:

- The European Robotic Arm for the ISS is one of the most comprehensive space projects ever executed in the Netherlands. ERA has been developed for ESA by a European consortium, led by Airbus Defence and Space Netherlands. The project provided valuable heritage for remote handling.
- Three major optical spectrometers for measurement of atmospheric gases have been built by Airbus Defence and Space Netherlands, partnering with TNO: Sciamachy on ESA's Envisat and the Ozone Monitoring Instrument on NASA's

Aura mission have provided state-of-the-art data and key knowledge of atmospheric processes.

Their successor TROPOMI for ESA's Sentinel 5 precursor mission is currently being calibrated and prepared for flight early 2016.

- Six optical delay lines were built and delivered to ESO's Very Large Telescope Interferometer in Chile

The Leiden-based space company is known for its, call it typically Dutch, approach: reliable, solution-driven, with a clear goal in mind, and always open to international collaboration.



Mr. Sytze Kampen

Head of Technology&Innovation

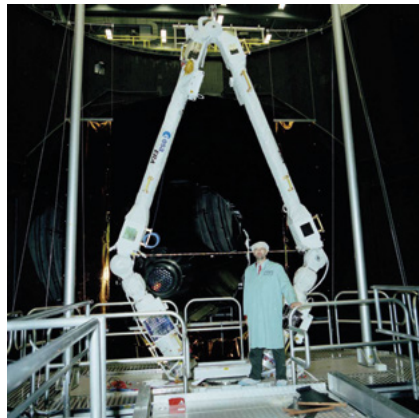
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BUTRACO

Let BUTRACO hatch your idea!

BUTRACO is a small service oriented prototyping activity for machines & parts. We not only engineer but also manufacture. To save time and costs we often work from a sketch only, or convert/ adapt existing products. Knowing many production techniques and having a large network of sub suppliers we can offer the best suitable production technology. Our way of working guarantees professional solutions and low throughput times. We can deliver in a timeframe that it normally takes to merely draw it on paper .

OUR OFFER:

- One stop shop for prototypes: we engineer and have it made.
- Over 25 years experience in machine building and part making.
- Know how; always the best suitable production technology.
- Small, flexible, and thus speedy results.

REFERENCES

Mostly universities or research institutes e.g.
Technische Universität München (ZAUM) Germany
– RIVM, The Netherlands – Adam Mickiewicz
University, Poland – University of Evora, Portugal etc .

BUTRACO

experienced in machinebuilding

Mr. P. (Pim) Buters

Director

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www.butraco.nl



DEMCON ADVANCED MECHATRONICS

ABOUT DEMCON

DEMCON researches, develops and produces high-tech systems and products for our focus areas of high-tech systems and medical devices. Due to our production capabilities, DEMCON can differentiate our self from other suppliers. Our clients receive not only a blueprint but also a working product or system.

MARKETS

DEMCON is a high-end supplier of technologies for the high-tech systems and medical devices markets. Within these markets, our focus is primarily on development and production.

DEMCON is highly proficient at applying, technical skills and high level of expertise in order to come up with surprising solutions to complex problems. The knowledge gained in one market enables us to look at problems in other markets in an open and creative manner.

CAPABILITIES

We have employees from a wide range of technical disciplines in every project group and make use of a large number of facilities.

- Mechanical engineering
- Software engineering
- Electronics engineering
- Industrial design
- Physics/optics
- Clean room
- Prototyping
- Production

REFERENCES

Philips – ASML – FEI – DORC – SIEMENS – TE Connectivity – Bronkhorst



Renée Koekkoek op Munsterhuis

Public Relations

Institutenweg 25

7521 PH Enschede

T: +31 (0)881 15 20 00

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Turnover: 20 M€ | 140 employees

www.demcon.nl



HEINMADE develops and delivers piezo system solutions ranging from a single bulk piezo to servo controlled multiple axis motion platforms. With our long term experience and extended network, we are able to detect critical aspects, to control and solve these aspects and to provide reliable solutions.

PRODUCT INFORMATION

Through collaboration with Noliac (DK), Nanomotion (Isr) and Piezomechanik (DE), HEINMADE offers a wide portfolio of standard products and system solutions. Over the years HEINMADE has extended this portfolio with developed custom made designs to meet the high demanding requirements of the high tech and medical industry.

Some examples of systems in production are; multiple axis long stroke motions systems, transducers, sensors and active damping systems. Present R&D work is focused on active damping, accurate dispensing and high force high precision stages. HEINMADE supplies basically all piezo related components and (sub-) systems:

- R&D work on piezo components and integrated systems.
- Design, engineering and supply of high precision metal parts like hinge structures, etc.

- (Encaged) Piezo actuators and benders (high and low voltage).
- Piezo motors and steppers.
- Short and long stroke piezo stages (actuator and motor based).
- Drivers and controllers for piezo actuators and motors.
- Active vibration dampers.
- Dispensing systems for low vapour pressure or high viscous substances.

REFERENCES

Philips Apptech – ASML – ESO – TNO – TU Delft
– TU Eindhoven – TU Twente – VSL (NMi) – FEI



Hein Schellens

Director

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Turnover: 1.0 M€ | 7 employees

www.heinmade.com



INDOLES PRECISION BV

ABOUT US

Indoles Precision is a platform for precision-positioning applications. Users and suppliers of products where accurate positioning is crucial, meet in an environment where a targeted and effective exchange about issues and solutions are enabled, under the motto How can we help each other?

For every business transaction a provider and a customer of a service or product are involved. The role of I-P in this process is to help this exchange, this communication to run efficiently and clearly, as the lubricating oil between a spindle screw and nut. I-P believes in sustainable relationships and that win-win situations form the fundamental basis for this: a solution is only successful if it works for everyone. People are always at the center of attention here, because even though high-tech solutions are concerned, it is ultimately determined at the human level whether the long-term cooperation is a success.

EXAMPLES OF PARTNERS

NanoFaktur from Villingen-Schwenningen (DE) is a manufacturer of piëzo actuators and piëzo based stages for 1D, 2D or 3D motions. It has more than 50 years combined expertise in the area of accurate

positioning in the nanometer range. The technical advantage of the NanoFaktur solutions lie among others in the large sensitivity of the piëzo material, in combination with stiff and compact mechanics.

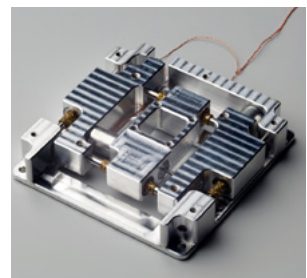
Mechonics from Munich /Paderborn (DE) develops compact stages with piëzo stick-slip propulsion. The advantages of this technology is self braking, 'long' stroke (up to 15mm) and step-positioning in the sub-micrometer range (both open and closed loop). Applications in UHV or 4K are possible as well.



Hans van Winden

Director

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PM-GROUP

COMPANY INTRODUCTION - DISCOVER PRECISION

As a strategic business division of the PM-GROUP we as PM-BEARINGS are highly specialized in designing and manufacturing high precision bearings and advanced motion systems in ultra high quality. We are providing a complete range of linear bearings, frictionless slides, (piëzo) positioning tables and stages, which guarantees high levels of performances at competitive prices.

Thanks to almost 50 years history of experience, new findings in research, combined with innovating linear technology, our products meet the highest accuracy and quality demands of today's industry and are successful in use world-wide. As a proud member of the PM-GROUP we are able to realize turn-key projects for our customers starting with design, project management, machining, assembly and after service.

OUR ACTIVITIES

As a strategic business division of the PM-GROUP we are a leading company in the development, integration and manufacturing of linear guides, guiding systems, nano-positioning stages and mechatronical [vacuum] modules for several high-tech markets and Synchrotron initiatives.

REFERENCE PROJECTS

Our experience with particle accelerator projects and synchrotron initiatives started all ready a long time ago. We have good contacts towards the synchrotron activities with Brookhaven National Laboratory(BNL), Diamond Light Source(DLS) and the Paul Scherrer Institute(PSI). For many years PM-BEARINGS delivered complex ceramic bearings

and they have already find a way to institutes as PSI. Furthermore we have a close relation with the Diamond Light Source(DLS) initiative in Great Britain. For DLS we deliver turn-key advanced beam-alignment modules combined with piëzo stage technology and sub-micron mechatronical integrated modules.

PM-BEARINGS COMPETENCES

Machining of exotic materials (Composites, Glass, Duplex, Hastelloy, Inconel, Nimonic, Invar, AMC, Titanium, Ceramics and Stellite) – from R&D to Serial production – Electro Chemical Machining (ECM) – FEM Simulation – Algor – CAD/CAM Design – Siemens NX7.5 – High Precision Machinery (sub-micron range) – Cryo Positioning Stages – Vacuum Positioning Stages – Nano Motion control – Linear technology – Piëzo technology – Nano-Positioning Systems – Mechatronical high precision modules – System Integration – Cleanroom facilities ISO class 5-6 (>1000m²) – Vacuum cleaning – (U)HV and UCV knowledge– Surface Treatment



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www.pmbearings.nl

"Q-Sys offers a unique service to motion system users. Whether your requirement is for a single system for research or development work or you are looking for a supplier of series production motion platforms, you have found the only partner you need."

"With its extensive experience in the specification, design and build of motion and positioning equipment, Q-Sys can take your basic outline or well defined specification and produce exactly the system you require, instead of trying to force an off-the-shelf product to fit your needs. The motion systems we produce use the very latest technologies to ensure performance to your exact needs, be it accurate motion control, precise positioning, stability, etc.

Q-Sys systems have applications in many varied industries and in every application there are a number of key measurables that define system performance. These include geometric and positional accuracy, acceleration and velocity and, some times most importantly, system eigenfrequencies and bandwidth. By a combination of detailed design, modern CAD tools and experience, Q-Sys offers systems that precisely meet the requirements of the given application in a cost effective and timely manner. As a manufacturer of systems rather than components, Q-Sys is able to pull together the very best hardware available, including motors,

encoders, bearings, drive amplifiers and multi -axis motion controllers. At all stages of the design and build process, Q-Sys engineers can work as closely with you as you require. From the initial concept discussions, through feasibility study, CAD design and on to system build and test, your involvement is encouraged. This will take the form of regular discussions, design reviews and sign-offs and even witnessed acceptance tests to validate system performance to the quoted specification.

As an added service to customers, Q-Sys is able to offer complete turnkey system solutions. This provides a motion platform configured as part of an overall package, that may include, for example, a laser source for welding, scribing or cutting, a safety or controlled environment enclosure, integration to existing inhouse systems, etc. In these cases the overall system is designed with safety and CE conformity in mind and is delivered, installed and commissioned with full certification. This method ensures your process is up and running far quicker than normal and with minimal impact on your own internal resources.

Finally, Q-Sys offers a comprehensive technical support service for many types of motion systems, ranging from telephone support, through system service and repair, to scheduled preventative maintenance contracts for production systems where availability and reliability are paramount."



Henry Over
Managing Director

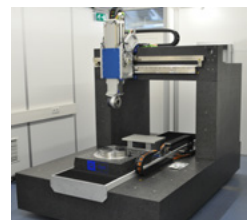
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www.q-sys.eu





3 **BASIC MATERIAL TECHNOLOGIES**

[illegible]

ANTONIUS

SHAPING THE IMPOSSIBLE

We make your design come to life

An experienced fabricator that can design your production process & build your newly developed product.

Your idea will be transferred into a design ready for production. As your partner we will take care of the complete project management, fabrication and assembly of your product.

Over 80 years of craftsmanship in shaping metals brought us to the level we are at right now. With our extensive knowledge of materials and production methods, with the best qualified welders in the industry and our special machines we can produce high quality products against all applicable standards. We have an ideal situated production location (40,000m²) with a direct waterside connection, to transport big parts by ship worldwide.

- 9% Nickel (X8Ni9)
- Stainless Steels
- Duplex / Superduplex
- Alloys
- Cladded Steels
- Welding
- Forming
- Heat Treatment
- Engineering
- Production

More info: contact us at sales@antonius.nl
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We introduce our company, which is already more than 50 years active in supplying, among others, the high demanding markets like Aerospace, Energy and medical also more general industry like Sanitary, Pumps, Hvac, and so on.

OUR PRODUCTS

Of course O-rings and Molded parts are within our scope of working, but also we realise, in cooperation, new designs. We have a lot of experience in rubber to metal or other base material combinations.

PRODUCED IN ALL KIND OF MATERIALS

Rubber compounds

SBR, NBR, EPDM, SILICONE, FPM (VITON), KALREZ

Synthetic

POLYPROPYLENE, POLYAMIDE, HYTREL,
POLYETHYLENE.

Gaskets

HD300, KLINGERSIL, FIBRE, NOVAPRESS...

Various

PTFE (TEFLON), FOAM MATERIAL, VULKOLAN..

Proven quality compounds with DVGW, KTW, WRAS, FDA, NSF Certificates.

We have our own KIWA and KOMO compounds with certificates.

International working is standard for us in buying possibilities. Exporting our goods is common business and with our experienced staff we always find a workable solution for your demands.



Mr. R.O.F. Klapwijk

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BODYCOTE VACUUM BRAZING

Bodycote Vacuum Brazing has been engaged in advanced brazing techniques for about 40 years. During these years an extensive know-how and vast practical experience have been built, unique for the industry. Practically all types of base metal, filler metals and brazing processes are being applied to hundreds of different products.

Bodycote Vacuum Brazing has several different types of brazing furnaces available for basic research, product development and production.

Bodycote Vacuum Brazing is ISO 9001, ISO 14001 and ISO 50001 certified.

PRODUCT INFORMATION

In the high temperature brazing process joints are generated in a vacuum atmosphere. The combination of high temperature and reducing atmosphere ensures metal oxides dissociate at the product surface. The process results in very strong joints (90–100% base metal strength) Due to the automated furnace control these joints can be reproduced with a constant high quality.

Bodycote Vacuum Brazing Diemen provides the following services:

Vacuum brazing – Special heat treatments in vacuum or reducing atmosphere – Consulting for material selection and design of braze joints.

MATERIALS REGULARLY HANDLED

Low and high alloy steels – Tool steel – Cast Iron – Stainless steel – Copper alloys – Titanium alloys – Superalloys – Carbides – Ceramic, composites, graphite

MARKETS SERVED

Power Generation and Energy – Oil & Gas – Measuring & Control – High precision tooling – Lithography – Aerospace – Pharmaceuticals – Science/research – Plastic Moulding



Henkjan Buursen

Head of Sales Brazing

Bodycote Hardingscentrum BV

Bodycote Vacuum Brazing

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50 employees

www.bodycote.com



ECM TECHNOLOGIES

ECM Technologies is a company offering non-conventional electrochemical machining solutions, with its headquarters located in the Netherlands and its production facility in the USA. It has been operating on the global market from its inception in 2003.

PRODUCTS & SERVICES

ECM Technologies focuses on offering unique Research & Development (R&D) on materials, followed by Production of the requested product, as well as Consulting & Training services within the expertise of precision electrochemical machining (pECM).

PRECISION ELECTROCHEMICAL MACHINING (PECM/ECM)

Electrochemical Machining is an advanced metal-working technique which can machine products difficult or impossible to design through conventional machining. It is an extremely accurate technique, capable of machining any electrically conductive work, even improved and new to machine metal alloys irrespective of their hardness, strength or thermal properties.

APPLICATION

Process application: Electrochemical Machining can add accuracy and substitute the following processes: drilling, polishing, milling, grinding, and roughening; along with machining & designing what conventional-machining cannot, such as micro-machining, shaping hard to reach locations, flow turning, and die-sinking among others.

Industry application: Furthermore, there are no boundaries as to where pECM can be applied. ECM Technologies have researched and developed for the majority of the high industries: Aerospace & Space, Automotive, Medical, Energy & Offshore, Consumer products, and Machine Tooling.



ECM Technologies

Innovative Electrochemical Machining Solutions

Hans-Henk Wolters

CEO

Ceresweg 42

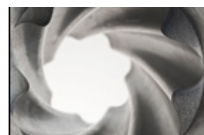
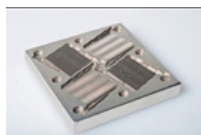
8938 BG Leeuwarden

T: +31 (0)622 37 97 50

E: wolters@electrochemicalmachining.com

Turnover: 1.0-1.2 M€ | 10 employees

www.electrochemicalmachining.com



ETCHFORM BV

Etchform provides customized solutions for thin metal precision parts for high-tech applications by means of etching & electroforming. Two versatile techniques, combining cost efficiency, flexibility, freedom of design and high quality.

SERVICES

We are globally able to offer complete solutions for one-off to mass production, for both discrete parts and reel to reel in a wide range of materials such as:

- Beryllium copper, brass, copper, new silver, phosphor bronze
- HyMu
- Molybdenum
- Nickel
- Nitinol
- Silver
- Specialty alloys: 7C27Mo2, Alloy 42, Elgiloy, Invar, Kovar
- Stainless steel alloys
- Titanium

Also Supply Chain Management is offered for complimentary operations such as:

- Cleanroom Packaging
- Forming
- Heat Treatments
- Surface Treatments

etchform

Wickeder Group

Johan van der Kraan

Managing Director

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APPLICATIONS

Our customers are found in all high-tech industries such as:

- Aerospace
- Automotive
- Defense
- Electronics
- Engineering
- Imaging
- Medical
- Piezo
- Semiconductors

Some typical applications are:

- Apertures
- Battery grids
- Combustion plates
- Contact springs
- EMI/RFI shielding
- Deposition masks
- Encoder discs
- Filters & meshes
- Implants
- Shadow masks
- Shims
- Solar cell connectors
- Washers



FUTURA COMPOSITES BV

SPECIALISTS IN FIBRE REINFORCED COMPOSITES

Components for products of the future. That is what Futura Composites produces. As a specialist in fibre reinforced composites, we are a reliable partner for all manufacturers of high-grade technical applications.

Futura Composites operates at the very highest technical level. We supply products of high-grade material according to unusual designs, which require extensive engineering work and are produced using highly advanced techniques. An extremely high delivery reliability complements the picture.

TECHNOLOGY

Futura Composites offers solutions for the technological challenges encountered by specific clients. We do not supply standard but only tailor-made products. Each product we make requires some measure of innovation. That is why creativity is central to our working methods.

Futura Composites performs the entire production process in-house, from design and engineering to production and testing. For this reason, too, we can guarantee the very highest quality.

Futura Composites is certified Iso 9001:2008 / Iso 14001:2004 / Iso13485:2003



Specialists in fibre reinforced composites

Martino Borgo

Managing Director

Marconistraat 40

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www.futuracomposites.nl

PRODUCTION TECHNIQUES

- Filament winding
- Prepreg (In and out of Autoclave)
- Resin Infusion
- Sandwich Construction
- Resin Transfer Moulding (also Vacuum Assisted)
- Machining Composites
- Testing Composites

MATERIALS

- Epoxy
- Phenolics
- Glass Fibres (E-R-S)
- Carbon Fibres (HM/ HS – Pitch /PAN)
- Aramids
- Dyneema



HAUCK HEAT TREATMENT EINDHOVEN BV

INTRODUCTION

Hauck Heat Treatment Eindhoven BV is the specialist in high quality heat- and surface treatments. Hauck Heat Treatment distinguishes itself by, besides heat treatments, in high temperature brazing and special CVD and PVD coatings. Unique is the in-house developed Stainihard® process!

Hauck Heat Treatment Eindhoven has various specialized technology engineers, where with we are like no other in a position to guarantee optimal quality. The quality level is emphasized by our various quality certificates ISO 9001, ISO 14001, AS9100 and NADCAP. We treat products for different demanding industries such as aerospace, automotive, medical, semiconductor and additive (3d printing) industries.

HAUCK HEAT TREATMENT EINDHOVEN IS YOUR PARTNER FOR:

Heat treatments in vacuum and protective atmosphere:

- Hardening & Tempering
- Annealing (stress relieve, solution annealing and aging)
- Brazing in vacuum or protective atmosphere:
- Vacuum brazing
- Belt furnace brazing

Surface treatments:

- PVD and CVD coatings

Thermochemical treatments:

- Nitriding
- Nitrocarborizing
- Stainihard®NC

Materials treated:

- Low and high alloy steels
- Stainless steel
- Titanium alloys
- Carbides
- Composites
- And various combinations
- Copper alloys
- Superalloys
- Ceramic
- Graphite



Hauck Heat Treatment Eindhoven BV

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www.hauckht.nl



HIGHRISE BV

Highrise Design specializes in the design of aluminium structures. As an independent design agency, we are able to assist you in optimizing the use of aluminium properties for your products and projects.

FROM DESIGN TOWARDS REALIZATION

Our extensive expertise in the field of aluminium is available for a broad range of markets. For example, Offshore Technology, Mechanical Engineering, Infrastructure and Civil Construction. Many years of experience in engineer-to-order projects has led to a reliable project approach. This professional attitude towards the design process proves valuable, both in the different design phases of your projects, as during the actual realization of your aluminium products and structures. Highrise Design can assist you with every step of the way: from a first global feasibility study of an aluminium product design towards setting up an adequate supply chain, including the selection of reliable vendors and capable fabricators.

ACCESS TO KNOWLEDGE AND EXPERIENCE

Steel has for decennia been the material for large loadbearing structures. The knowledge of steel is much broader available than of aluminium. For this reason, it can prove hard for companies to reach an optimal design for their product or projects. As a result, the application of aluminium can become unnecessarily expensive. The proper application of this strong and lightweight materials remains out of reach. Highrise Design aims to provide customers access to their broad knowledge and experience in aluminium. Together we reach the best solution.

INDEPENDENT

Highrise Design knows every possibility for fabrication but does not operate its own workshop. For our independent design agency, the use of aluminium is not a goal in itself, but simply a means: only careful weighing of various possibilities will lead to the most effective solution. Often this solution inevitably surfaces as an integral solution, using various materials in their optimal way. It is the intelligent combination of aluminium, steel and/or composite that results in a winning product.



Albert Hogewoning

Owner

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Innogrind applies more than 35 years of grinding technology know-how to solving the challenging problem of grinding burn. Using high-end measurement and analysis techniques such as Barkhausen Noise Analysis and X-ray diffraction, we are able to investigate and understand the dynamics of specific grinding processes. This in turn enables us to improve and optimize these processes.

Furthermore, we have also developed in-house the unique 3D-printed INNOZL™ titanium coolant nozzle. Since its introduction, this nozzle has brought about a worldwide revolution in the reduction and prevention of grinding burn by means of efficient coolant delivery to grinding processes.

For more information on INNOZL™, please visit www.innoz.com

The detection and subsequent prevention of grinding burn: this is the mission of Innogrind, and it has been our driving force since 2009. A force that has brought us to today's service offering for the analysis and optimization of grinding processes. Our success in this field is due in part to our cooperation with strong partners in the industry, such as Stresstech and Hirt-Line, and we also offer solutions based on Barkhausen analysis and X-ray diffraction. In addition, we also provide training for grinding operators. Innogrind also offers a concrete solution for the prevention of grinding burn, with our self-developed INNOZL™ coolant nozzle. Combine the INNOZL™ with a Hirt-Line pipework system, and you have a complete and highly stable 50 bar coolant delivery system for burn-free grinding.



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SERVICES

Process analysis in grinding

When it comes to the analysis, detection and solution of grinding burn, there is no partner more competent than Innogrind BV. Grinding is an industrial process that generates considerable heat. If this heat is not quickly removed by a suitable cooling process, it can have an adverse effect on the service life of the product. Grinding burn is a common cause of machine or engine component failure. Innogrind offers a total solution to this problem, from detection of the cause, through to specific measures aimed at prevention of thermal damage. For the assessment and optimization of your grinding processes, we offer Barkhausen Noise Analysis and X-ray Diffraction. Moreover, we can provide significant added value to the cooling of your grinding process with the Innogrind-developed INNOZL™ coolant nozzle.

Training

Innogrind provides practice-based grinding training on your premises. Giving simple tools to your staff to improve the ability to solve grinding burn problems. Don't ask your employees to seek the limits; instead, give them the tools they need to go beyond the limits.

Stress technologies

X-Ray Diffraction (XRD) – Barkhausen Noise Analysis (BNA). For questions or enquiries, please contact us by email or phone.



INNPLATE

INNOVATIVE AND CREATIVE

We are the specialists in (electro)chemical surface technology: electroplating, etching, electrolytic and chemical polishing, electroforming, anodizing, colouring, chemical treatment, coating and cleaning.

IN OUR 2000 M² OF DEVELOPMENT LABORATORY WE OFFER:

- Contract R & D
- Analysis and tests
- Consultancy & engineering
- Laboratory production and pilot shop

MARKETS

High Tech Industry – Aerospace – Defence – Solar – Medical – Additive manufacturing – Science

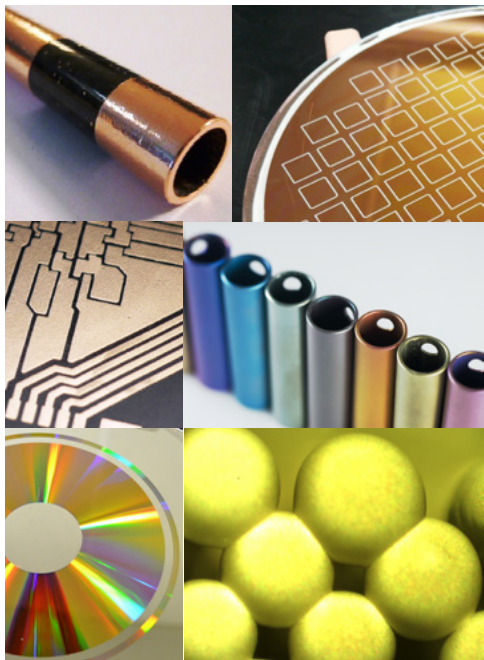
QUALITY

ISO 9001 – AS9100

INNPLATE®
SURFACE TECHNOLOGY

Robbert de Greef
Fred Arendsen

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5692 AN Son
T: +31 (0)40 751 52 49
E: info@innplate.com
www.innplate.com



KERSTEN KUNSTSTOF(F)COATING

We have been applying high-value, high-quality plastic coatings to metals since 1967. We use thermal processes to apply these coatings at our production locations in Brummen (NL) and Kahla (D). We apply coatings using fluidized beds, electrostatic powder coating and rotomoulding.

SOLUTIONS

A plastic coating is much more than just a protective layer. The specific properties of a coating determine where applying it is desirable or required. This summary shows you the solutions offered by our various coatings:

- Corrosion protection
- Non-stick properties
- Insulating and conducting coatings
- Flexible coatings
- UV-resistant coatings
- Certified coatings

A VARIETY OF APPLICATIONS AND SECTORS

Kersten Kunststof(f)coating provides solutions in many sectors. Our customers are largely in the drinking water production, process and chemicals, semiconductor, mechanical engineering and pharmaceuticals sectors.

WHAT CAN WE DO FOR YOU?

Every plastic coating has properties that makes it suitable for specific applications. Here is an overview of the coatings that we use:

- Rilsan®
- Halar®
- Xylan®
- PTFE, FEP, PFA and ETFE
- Resicoat®
- Abcite®



Kersten Kunststof(f)coating

Henk van Dijk

Managing director

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www.kersten-bv.nl



MULTIVALENT PLATING & ETCHING

PRECISION ELECTROPLATING AND CHEMICAL TREATMENT

- Fast delivery
- Prototypes and series
- High quality electroplating techniques

NO STANDARD JOB COATER

- We offer high-grade electroplating and chemical treatment for your product or application, according to specs or customised processes:
- (ultrasonic)cleaning, masking, cleanroom packing
- pickling and passivation (AMS-2700, AMS-QQ-P-35, DIN-EN2516)
- electropolishing and chemical polishing (ASTM-B912)
- nickel plating: matte (AMS-2424), bright
- electroless nickel (low-mid-high phosphor; AMS-2404, MIL-C-26074); nickel-PTFE
- copper plating: matte, bright, electroless

- tin plating: matte, bright tin (ASTM-B545; MIL-T-10727)
- zinc-nickel electroplating (DIN-50962)
- precious metal plating: silver, gold (AMS-2422, ASTM-B488-95, ISO-4523), gold-cobalt, palladium, ruthenium, ENIG, PPF
- blackening of copper (UN-D452) and stainless steel (MIL-DTL-13924)
- etching of aluminium, tungsten, molybdenum

MARKETS

High Tech Industry – Aerospace – Medical –
Defence – Science

QUALITY

ISO 9001 – AS9100



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Robbert de Greef

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TER HOEK VONKEROSIE

TER HOEK VONKEROSIE — CO-ENGINEERS WITH PRACTICAL KNOW-HOW

Completing orders for the construction and machining of tools and components whose complexity demands leading-edge solutions bordering onto the impossible is a challenge that Ter Hoek thrives on. With a high level of technical know-how and high-tech machinery, Ter Hoek has become the European market leader at the very highest level. Through co-engineering, Ter Hoek solves issues in which extreme dimensions, accuracy (to 1 μm) and materials play a major role.

The most important markets are the semiconductor industry, aerospace, medical industry, energy and offshore. For these high-tech industries Ter Hoek has distinguished itself as a 'problem solver' because it is able to translate a client's request into a technically practical solution. Using fully- acclimatised rooms.

LASER MICROJET TECHNOLOGY

Ter Hoek has invested in an new technique, the Laser MicroJet technology from Synova enables it to machine non-conductive materials to within microns. This laser cutting technology is completely different from conventional lasers. As the laser is surrounded by a 30- μm water jet, no focus point is required and square edges are possible. This new technology substantially reduces the lead times for certain products.



Gerrit ter Hoek

Director

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INVESTMENTS

Ter Hoek has also invested in three new EDM machines. The Form 400, Form 30 and the Cut 1000 from AgieCharmilles. The Form 400 is the largest die-sinking electrical discharge machine produced by AgieCharmilles and has a working range of X-900, Y-700, Z-500 mm; the weight of a workpiece can be up to 4,000 kg. Thanks to the special hole in the machine's clamping bed, which is \varnothing 650 mm and 750 mm deep, it is possible for workpieces to be machined vertically. The Cut 1000 is a special thin-wire machine for wire diameters of between \varnothing 0.02 and \varnothing 0.03 mm. Because traceability is becoming increasingly important for Ter Hoek, it has also invested in a laser engraving machine, which ensures optimum product traceability.

HIGHER LEVEL

In order to take the company to an even higher level Ter Hoek is currently undergoing AS9100 (aerospace) certification and is aiming to be granted its certificate in its 25th anniversary year (2015).



VDL FIBERTECH INDUSTRIES

VDL Fibertech Industries is one of the longest existing composite companies in the Netherlands. We are a certified (UL and ISO's 13485 and 14001) supplier of fiber-reinforced thermoset parts by means of RTM, RIM and hot pressing. With more than 45 years of knowledge and industrial experience, we are able to produce innovative, complex and high-quality parts.

We focus on three market segments: high performance, healthcare and transport parts. For these segments, we make products with very high requirements for market leaders in current and next-gen applications.

Our services include: product development, prototype construction, series production, assembly and after sales. By being involved in product development at an early stage, we can guarantee the manufacturability of composite products. With this we ensure a competitive product price that meets customer requirements.

With our modern production facilities, it is possible to produce products from very small to very large (3x5m) dimensions, combined with a typical batch size of a few tens per year to continuous large series.

As a company, we are part of the VDL Groep, which consists of more than 100 companies and around 16,000 employees spread all over the world.

VDL Fibertech Industries



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ENGINEERING

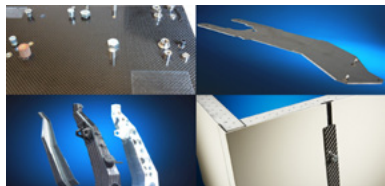
- >45 years experience
- Pro-E CAD software
- FEM analysis
- Prototyping
- DFSS and DFM
- RTM Worx flow analysis

PRODUCTION

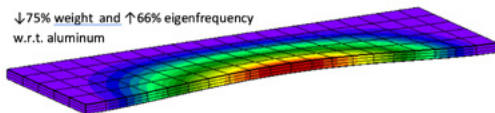
- PUR and fibre reinforced thermoset composites
- 10.000 m² production floor incl. cleanroom
- (VA-)RTM, Hot Pressing and (S-) RIM
- Sizes up to 3x5meters
- 2D stacked fiber cutters
- Robotized gelcoat/paint cabin
- Robotized preforming, contouring, gluing
- Particles free surface solutions

QUALITY

- ISO 13485 and 14001
- 3D CMM
- X-Ray/NDT
- Instron test bench
- 3D laser radar



↓75% weight and ↑66% eigenfrequency
w.r.t. aluminum





3.1 BASIC MATERIAL TECHNOLOGIES

**MACHINING OF ODD MATERIAL (CERAMICS, OFC,
MARAGING- AND DUPLEX STEEL, BERYLLIUM)**

[illegible]

ADMATEC EUROPE

CHALLENGING THE INDUSTRY 4.0

With more than 25 years of experience in shaping powder metallurgy we have developed the Admaflex Technology. An indirect 3D printing process to make end-use parts in ceramic or metal. At this point, it is the most reliable and precise technique delivering high quality parts with fine features. With the fast, accurate and versatile 3D printer series – Admaflex 130 and 300 – products can be made for high demanding markets like the process industry, for medical equipment, high-tech components and investment casting.

ADVANCED CERAMIC AND METAL 3D PRINTING ON ONE SYSTEM

Featuring the unique capability of 3D printing both advanced ceramics and metals on one system. This technology is ideal for the development and production of functional and aesthetical parts requiring complex geometries, high resolution, fine details, and smooth surface while benefiting from excellent material properties.

PATENTED ADMAFLEX TECHNOLOGY

The 3D printers are designed with the patented Admaflex Technology to effectively handle materials with high viscosity, normally associated with ceramic slurries, enabling high reliability and printing speeds. This innovative technology also facilitates efficient feedstock management by reusing the excess material. A very small amount of slurry is sufficient

to start printing, which makes the system ideal for research and 3D printing of precious materials.

THE BENEFITS

- High throughput
- A clean workplace and no material waste
- Quick and easy material switch
- Working with a broad viscosity range
- In-process monitoring

MODULAR CONCEPT WITH OPEN SOFTWARE FOR MAXIMUM FLEXIBILITY

Moreover, the printers are modular and with an open platform, enabling full customization to your needs and budget, and also providing full control of the printing process as a result of in-process monitoring. It facilitates loading your own or other materials than ceramic or metal on the machine making own material development more flexible.

ADMATEC
Additive Manufacturing Technologies

Loran Mak

Sales Manager

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www.admateceurope.com



BKB PRECISION

For almost forty years, BKB Precision has been a reliable partner when it comes to machining high-performance plastics. BKB Precision is your specialist for the high-tech industry, and your partner for the CNC machining of high-performance plastic parts up to an accuracy of μ . BKB strives to establish a Make & Advise partnership with their customers. BKB Precision is fully aware of the customer's goals and challenges when it comes to managing costs in the area of design, manufacture, and logistics. BKB Precision is not only your manufacturing partner, but also your supplier in realizing your assembly, cleaning, and supply chain needs. BKB Precision is ISO9001 certified.

BKB PRECISION | CORE COMPETENCES

We produce in a conditioned (temperature and humidity controlled) production hall with a wide range of CNC machines for 3-, 4- and 5-axis milling, with or without robot/cobot automation. For complex products, we use 5-axis simultaneously milling. For large plates we have portal milling machines. For turning parts we have CNC turning and turning/milling combinations, up to 7 axis. In addition, we also provide (cleanroom) assembly, cleaning, packaging and testing of products. BKB Precision takes care of your product!

We process technical plastics, high performance plastics and foam materials. Examples include: PEEK, Torlon, PEI, PAI, Airex, POM, PA, PC, HMPE, PETG, etc.

BKB PRECISION | MARKETS

We are active in various high-tech market segments such as semiconductor, medical, defence, aerospace, food, machinery and chemicals.

BKB PRECISION: REFERENCES

ASML – CERN – Trumpf – Storz Medical – Philips –
Thales – VDL-ETG



Berrie van de Burgt

Account Director

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CERATEC TECHNICAL CERAMICS BV

“THE ADDED VALUE OF CERAMICS”

Ceratec Technical Ceramics develops and designs customer applications where components of technical ceramics have added value.

We help our customers to add value to their products and processes by applying our extensive knowledge of ceramics.

Innovation and customer focus are the base of what we do. With more than 35 years of experience, we've built unique knowledge base in how to apply ceramics, and are impartial in choice of ceramic material to best suit the customers application.

YOUR SOLUTIONS: CERAMIC ON THE RIGHT SPOT!

- UHV components with unprecedented stiffness.
- Dry and vacuum running bearing systems and linear guides.
- High temperature resistant components.
- Active or passive radiation influencing components.
- Extremely high heat conducting while electrically insulating.

OUR COMPETENCES:

- Development & engineering
 - Customer specific
 - Independent material selection
 - Highly skilled and experienced engineers
- High precision components
 - Up to 1 micron accurate
 - Complex component shapes
 - Large ceramic parts
 - Surface roughness up to Ra 0.01
- Joining techniques and assembly
 - Ceramic to metal assemblies
 - Ceramic to Ceramic connections

ceratec[®]
TECHNICAL CERAMICS BV

Steven Visser

Director

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FORMATEC

Formatec Ceramics specializes in the development and manufacturing of technical ceramic products and components. With technical ceramics it is possible to produce highly wear-resistant, temperature-resistant, biological- and chemical-resistant products. Products which are used in (high-tech) industry as well as in exclusive consumer goods.

For example, Formatec Ceramics produces ceramic products used in pumps for the chemical industry, where there is a high demand on wear-, temperature- and chemical resistance. We also make components for medical devices with very small dimensions, here technical ceramics can perform as either an electrical and thermal insulator, or as a conductive material. We also make exclusive design products such as watches, telephones, pens and jewellery – all these use ceramic parts made by Formatec Ceramics. Formatec Ceramics has already spent many years researching innovative applications of technical ceramics and constantly improves the Ceramic Injection Moulding process. With injection moulding, products can be made that would simply not have been possible using machining techniques. This is one of the unique characteristics of technical ceramics.



Harrie Sneijers, Sales Manager

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www.formatec.nl

FORMATEC

- Can support the redesign of your product in close cooperation with you. We can develop the required moulds, jigs and fixtures.
- Is researching new materials, bonding systems, colours and processes.
- Uses existing geometries from which prototypes can be made by machining. Also available is additive manufacturing (3D printing) for which we use DLP technology. With this method we can produce one off or small series.
- Has a range of advanced high-precision machining tools. We can grind flat surfaces, as well as complex geometries with our 5-axis machine. Essential finishing processes are located in a cleanroom environment to ensure the highest of industry standards.
- Offers several surface finishes. From a high-gloss up to a frosted look. For laser engraving or surface decorations we work with a specialized laser company.
- Offers the service of assembly if the ceramic product requires assembly with other components.

Quality is assured at Formatec by our QC team. With the at most care our people conducting measurements with support of advanced measuring devices and/or visual inspection to ensure the required quality is delivered to the customer. Formatec respects the ISO 9001 protocols which supports our quality goals.



LOUWERSHANIQUE BV

LouwersHanique is a leading specialist in the development and manufacturing of high-end solutions in the field of the thermal and mechanical processing of technical glass and ceramic materials.

The company activities also include the bonding and [clean room] assembly of unique material combinations based on an extensive range of bonding and integration technologies. The main company focus and strength lies with low volume – high mix niche solutions for high-end applications and leading edge industries and customers driving today's and tomorrow's technological progression.

One of the main activities is the development and manufacturing of electrical and optical feed-throughs. Our electrical and optical feedthroughs offer hermetic and electrical isolation in Ultra-High Vacuum (UHV) and High Pressure applications with a lifetime leak-free performance from Cryogenic temperatures up to 500 degrees C. We apply proprietary glass-to-metal binding technologies to directly seal pins and other components into the metal flange without laser welding or other sealing technologies. No local thermal stress will occur and virtual leaks are absent. With our technology we can make use of standard flanges as well as

custom designed parts and assemblies, exceeding the limitations of existing technologies.

Based on a modular concept we can integrate low noise Coaxial, High Power/High Voltage optical and other feedthroughs in Flanges and modules without the need of laser welding with extremely high integration levels. In-house cleanroom assembly, process control and state-of-the-art surface finishing and cleaning equipment guarantee flawless surface texture and topography for the most demanding applications. To ensure that all products are leak tight LouwersHanique has the newest testing facilities available as Helium testing equipment, RGA detection equipment, ultrasonic cleaning and 3D measurement systems (CMM) including white light interferometry for nm accurate surface inspection.

The company implemented World Class Manufacturing, JIT and 5 S best practises resulting in 100% process and quality control thus leading the highest possible QLTC reliability and overall product value for the lowest integral costs. This, combined with our highly skilled and motivated workforce of over 110 technicians enables us to produce components and solutions of consistent and high quality on time, every time. LouwersHanique is located in the High Tech Brainport Region of the Netherlands and is ISO 9001:2008 certified by TÜV



LouwersHanique

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NEBO SPECIAL TOOLING BV

THE MANUFACTURING SPECIALIST FOR HIGH-END MACHINE PARTS

Nebo Special Tooling BV manufactures high-quality machine parts and high-end mould parts. In addition to complete assemblies, we also manufacture individual mechanical precision components for many industries such as aerospace, medical, semi-conductor (grade 2-4) and defense.

Our specialty lies in very precise machining of hardened and exotic materials: hardened steel, Stavax, Inconel, titanium, etc.

EXPERTISE

We have over 35 years of experience in milling, profile grinding, die sink and wire EDM. We are well aware that with such an experience we can not rest and therefore we continue to invest in the latest techniques, training and production processes.

MAKING A DIFFERENCE FROM A VISION

In recent years we have distinguished ourselves by becoming a specialist in High Speed Milling (HSM) in hardened steel and exotic materials.

The HSM milling has taken over many of the operations such as die sink EDM and polishing.

These HSM operations are carried out at Nebo on the world's most accurate machines by the Japanese brand Yasda.

Nebo Special Tooling has 3 Yasda HSM machines:

- YBM 640 Type-3
- VI40 5-axis simultaneous machining center
- YMC 650 Micro Center (milling within submicron range possible!)

The Yasda machines enable us to mill ultra precisely with very small diameter milling where high tolerance requirements are required. Very smooth surfaces with roughness up to 0.01 Ra are also possible.

INVESTING IN THE FUTURE

Nebo Special Tooling is at home in the high-tech Brainport region, but is increasingly finding opportunities and challenges in developing high-end markets such as solar, nano and fuel cell technology. Nebo can be found where the demand for high-quality and innovative products is most needed.



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4

MANUFACTURING AND ASSEMBLY TECHNOLOGIES

MANUFACTURING AND ASSEMBLY TECHNOLOGIES	Company size	Speciality (USP)			Area							Service	Supply				Test & Measurement								
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal													Project Management	Systems Engineering	Technical Consultancy	System Supplier	R&D	Development	Engineering	Production / Assembly
						Large	Small	Mechat.	Cybo	Vacuum	Electronics HW														
3D Metal Forming	S	metal forming; bonding	050101; 050103; 0504	predictive controlled explosion	x																				
Buigstaal Tube Bending		custom bended tubes in exotic materials; piping	050102	tube bending; welding; metalforming; finishing	x	x												x	x						
De Valk		mechanical parts supplier	05	3D printing; machining; assembly														x	x						
Jeveka		tailored fasteners and tools	050106; 0208; 0303; 0308	customized and special articles; standard 24h delivery	x	x		x	x					x			x	x	x						
Mat-tech BV	S	metallurgy; analysis; joining; alloys	0501; 050405	brazing large; small series; SEM; Xray	x	x								x			x	x	x						
Metrik Fasteners		special fasteners	050106; 050208	off the shelf and customized fasteners and studbolts										x				x	x						
Oceanz		additive manufacturing	05040503; 05040408	certified 3D printing consulting and on demand		x										x	x	x	x						
Tebunus Tube Bending	S	custom bended tubes in exotic materials	050102	CNC tube bending and welding; small radius	x													x	x						
Telmastaal		exotic steel and alloys; custom products	0501	supply and maching exotic alloys and stainless steel	x	x								x					x						
Velmon Lastechniek	S	stainless steel pipe sections and joints	050102	manufacturing; orbital welding; X-ray; helium test				x	x									x	x						

3D-METAL FORMING

PRODUCT INFORMATION

3D-Metal Forming BV is specialized in metalworking by the use of dedicated explosive materials. New production processes are developed within the company by using CAD, FEM simulations and photogrammetry.

Explosive bonding makes the joining of unique metal combinations possible, such as molybdenum to copper or tungsten to CuCrZr.

3D-Metal Forming BV is your partner in developing new solutions.

We can provide a full process and manufacturing chain including e.g. explosive bonding, machining, brazing, electroplating, HIP etc.

Explosive forming provides complex double curved shapes, formed from sheetmetal.

The possibilities in size, shape, metal and sheet thickness are almost unrestricted.

Only one tool part (comparable to a lower die) is needed so that Non Recurring costs are kept to a minimum.

3D-Metal Forming BV serves customers Worldwide in the markets Big Science, Energy, Aerospace and Architecture.

We continuously develop new, innovative solutions. For example, the development of the explosive forming of large, 60 mm thick stainless steel plates for the ITER vacuum vessel led to the development of an integral Nose Fuselage for Airbus. This component is explosive formed out of one, 100 mm thick aluminum plate, and fully machined after explosive forming. For Airbus this results in significant weight reduction of the Nose Fuselage structure.

REFERENCES

RES (Cadarache): explosive formed panels of the water basin – ITER (F4E): explosive bonded CuCrZr-stainless steel tube transitions – ITER (RFX): explosive bonded molybdenum to copper, machined and warm formed – MAST (Culham, UK): explosive formed cans for poloidal field coils



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BUIGSTAAL TUBE BENDING

THE TUBULAR COMPONENT SPECIALIST IN THE NETHERLANDS.

Buigstaal Tube Bending is an ISO9001 certified specialist in tube bending, as well for the assembly of tubular components in Ferro and Non Ferro materials with a diameter from 6.0 mm up to 168.3 mm.

Buigstaal has, in the course of more than 85 years, achieved a top position in both domestic and foreign markets. We supply markets like the automotive industry, industrial compressor manufacturers, shipbuilding and the offshore, nuclear and energy industry.

Besides tube bending Buigstaal can also offer some additional processes like :

- Reducing/expanding a tube's diameter;
- Partial flattening of a tube;
- Tube end forming;
- Drilling or milling of holes;
- Applying threads and bevel ends;
- Certified welding;
- Piping and construction.

Buigstaal Tube Bending has good contacts with companies specialised in surface treatments. As a result, we can offer treatments including:

- hot-dip galvanisation and electrogalvanisation;
- wet painting and powder coating;
- cataphoretic painting;
- pickling and passivation;
- electroless nickel plating.



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DE VALK

WELCOME TO DE VALK MACHINE FACTORY

The De Valk machine factory is a dynamic organisation established in 1948 in Valkenswaard, close to Eindhoven, the Netherlands. We are specialised in the production of mechanical components in all common steel types, non-ferrous metals and plastics, as well as the full production and assembly of modules and machines.

Furthermore, the de Valk machine factory has the capacity and the expertise to offer a broad range of additional services such as hardening, anodising, nickel plating, sheet metal work and engineering.

3D PRINTING TECHNOLOGY METALS:

De Valk offers engineering and 3D metal printing services and supports its customers in the technical and commercial trade-off between the unique 3D printing feasibilities and the established machining technologies.

3D PRINTING UNIQUE FEATURES ARE:

- Weight reduction by creating hollow stiff structures (internal hollow structures)
- Design of complex and free form internal cooling channels (cooling optimization)

OUR SERVICES INCLUDE:

- Topology optimization and engineering services
- Prototyping both 3D printing (Additive Manufacturing) and machining
- Business case validation

Our machine factory has a fully equipped cleanroom facility that complies with ISO class 7.

This website should give you an impression of our company's possibilities and versatility.

Interested in finding out what our company can do for you? Please feel free to get in touch with us.



John Hagelaars

De Vest 76

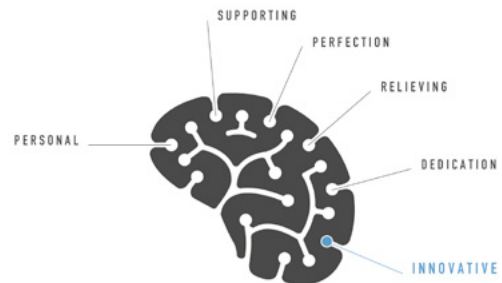
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www.machinefabriekdevalk.nl



THINK IN TERMS OF SOLUTIONS

ALWAYS LOOKING FOR THE MOST SUITABLE CONNECTION

Jeveka has 100,000 products in its program and supplies more than 35,000 fasteners and tools from stock. *We call that clarity.*

As a technical wholesaler we keep a wide range of products in stock. These are products in the fasteners and tools market. We establish long-term relationships with the manufacturers of our products. We carry many products from renowned brands. In addition, we produce and modify ourselves based on the requirements and wishes of customers, or we supervise that process. Think of a different shape or surface treatment.

Our quality department ensures that our products do what we promise. To this end, each package contains a sticker with a code with which we can trace the products to a specific batch and the corresponding specifications. We call that clarity.



Jeveka

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E: Inkoopafdeling: purchase@jeveka.com

E: Financieel: finance@jeveka.com

www.jeveka.com



MAT-TECH BV

Mat-tech BV is an innovative metallurgical company with a proven track record as interconnection technology supplier. Mat-tech consists of two business units and focuses on research, development and production of high-tech soldering and brazing.

R&D AND PRODUCTION

Mat-tech Development & Testing has specialized in development, optimization and implementation of innovative joining technologies. Various services such as contract R&D (e.g. application and process development), consultancy (process improvement), testing services (reliability) and failure analysis, prototyping and special alloy production are offered. Mat-tech Production offers the opportunity to outsource your high-tech soldering and brazing production, for large series as well as for single pieces.

Mat-tech is servicing a wide variety of industries, a.o. medical, lab equipment, electronics, electronic components, automotive, machine building, process industry, solar industry and aerospace.

KNOW-HOW AND EQUIPMENT

Both extensive know-how as well as in-house equipment are present at our company and through our trusted network.

A wide variety of equipment, such as Scanning Electron Microscopy equipped with Energy Dispersive X-ray Spectroscopy, Optical Microscopy, Meniscograph (Wetting balance) and furnaces for vacuum brazing, inductive soldering, etcetera.

INDUSTRIAL APPLICATIONS

Mat-tech is servicing multiple industries, such as medical, lab equipment, electronics, electronic components, automotive, machine building, process industry, solar industry and aerospace.

mat-tech 
innovative soldering & brazing

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Mat-tech Development & Testing

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METRIK FASTENERS BV

PASSION FOR FASTENERS; DISTRIBUTOR AND AGENT

Metrik Fasteners is a new player in the field of fastening technology and -distribution. Started as a distributor of standard fasteners, Metrik Fasteners has recently acquired, as part of the expansion of our strategic focus, three agencies of European producers in special fasteners and studbolts. This enables Metrik Fasteners to focus on three main product groups: Standard Fasteners, Special Fasteners and Studbolts.

STANDARD FASTENERS

In close cooperation with the West-European market leader (Germany), Metrik Fasteners offers a wide range of industrial fasteners.

Our stock includes 80.000 items, available in all dimensions and surfaces, both Metric as ANSI!

SPECIAL FASTENERS (AGENCIES)

TS-Verbindungssteile GmbH is a state of the art production plant in special fasteners!

More than 300 different steel sorts are held in stock (Hastelloy, Inconel, Nimonic, 254SMO, Titanium, etc). These products come in more than 100.000 different shapes and sizes: produced according

to DIN/EN/ISO/ANSI/BS/AS standards, or manufactured according to customer drawings or samples.

TS products are approved and certified by all recognized testing agencies (TÜV, ABS, BV, DB, DNV, GL, KWU LRS AND NV).

Vial Freres is a manufacturer of bolts and nuts in carbon- and stainless steel. Vials specialism is hot-forging, anchor rods and heat-exchanger plugs.

STUDBOLTS (AGENCY)

Zobel is a solid partner in the production and distribution of studbolts and jackscrews. We can guarantee short lead-times because our 400 tons of semi-finished and finished products: (A193, A194, A320, A453, etc).

REFERENCES

Siemens – Alstom – SNCF – GEA – Edilon –
Bronswerk – Cofely – Heerema – Mokveld Valves
– Enecogen – GDF-Suez – Airpack



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www.metrik.nl

www.ts-verbindungssteile.de

www.zobelh.com

www.vial-freres.com



YOUR 3D PRINTING PROFESSIONAL

As an innovator, Oceanz is the specialist and market leader in Additive Manufacturing in the Netherlands. As manufacturer we are your reliable production partner. As a supplier we work on efficient processes, optimal supply chain management and short delivery times with high delivery reliability.

CERTIFIED 3D PRINTING EXPERIENCE

Oceanz already has years of professional 3D printing experience. We are very familiar with the market, peers and professionals, based on many practical business cases in various sectors as Industry, Aerospace, Automotive and Medical. Oceanz is the largest 3D printing Service Center of Northwest Europe and is the first 3D printing company in the Netherlands with an ISO 9001 & ISO 13485 certification.

3D PRINTING INNOVATIONS

Oceanz is always looking for new materials, products and techniques. We support our clients in the search for the best use of 3D printing technology and related materials. Developing together with them and we co-create 3D printing innovations that make the difference in every production.

REFERENCES

Nikhef, TNO, Bosch, TU Delft, TU Eindhoven, NLR



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TEBUNUS TUBE BENDING

Tebunus stands for Flexible With Metal.

Tebunus Tube Bending can handle all bendable materials, such as carbon, stainless steel, grinded/polished steels, copper, aluminium and other exotic grades. Tebunus is a powerful business partner. The number of industries in The Netherlands and abroad that call upon our expertise in bending technology and related operations, is still increasing.

Tebunus Tube Trading provides heat exchanger and condenser tubes with an outside diameter of 9.53 up to 50.8 mm. We deliver lengths up to 22 meters of both welded and seamless steel types, such as carbon alloy, nickel alloy, titanium, stainless steel and copper alloys. The chemical and petrochemical industries apply custom made U-tubes (or hairpins) in heat exchangers and condensers, pressure vessels and reaction vessels.

Tebunus Tube Trading has many years of experience and offers the requested craftsmanship. Our fully automated CNC (computer numerical control) controlled bending machines guarantee excellent accuracy and optimum durability. We bend according to VGB quality standards; wall thickness and ovality are standardized. Because of our short and efficient communication lines, we deliver high quality on very short notice.

Tebunus Tube Bending BV & Tebunus Tube Trading BV



Mieke Genefaas

Managing Director

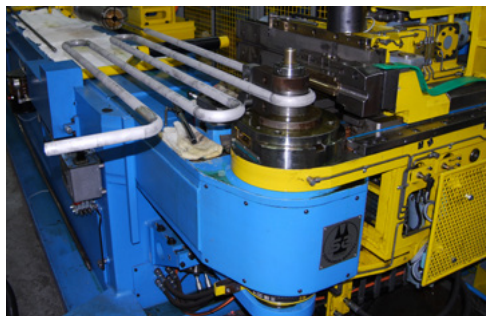
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TELMASTAAL

The strength of Telmastaal and Telmastainless lies in the fact that they complement each other in the way they offer total solutions to each demand concerning steel and metal components.

- Telmastaal provides their customers with high quality steel, precious metals, copper, special alloys. Furthermore Telmastaal provides her clients with professional advice and expertise.
- Telmastainless is the specialist in custom products of high quality stainless steel and nickel based alloys.

We offer a total solution for your application and have lots of experience in material handling thanks to the experienced staff and a large network of producers. Our daily business is to take care of and provide the best possible handling of your assignment.

We supply material to various industries including:

- Automotive
- Energy
- Medical
- Aerospace
- Offshore

For further information please refer to our website for an overview of our complete product range.

TELMASTAAL TELMASTAINLESS

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VELMON LASTECHNIEK

Velmon Lastechniek BV is a company for all kind of stainless steel tubes solutions. Many years of experience with cryogen-, food- and pharmacy industries. Assembly and welding in workshop and on site!

PRODUCT INFORMATION

Manufacturing and orbital welding of stainless steel pipe sections and pipe joints. Orbital welding with closed chamber and open weld head, range from $\varnothing 6\text{mm}$ until $\varnothing 168.3\text{mm}$. Series from 1 – 1000+, X-rayed, pressure test, helium leak-tests (max. $1 \times 10^{-9} \text{ Pa m}^3\text{s}^{-1}$) and oxygen clean treatment. ISO 9001 and ISO EN3834 (under construction) MIG-welding (GMAW), TIG (GTAW) certificated EN287-1 and EN1418.

REFERENCES

CERN – Corus steel – TEVA Pharmachemie – Trelleborg – Klinger-Picoff – Kenz-Figee – Tekoma – Cofely



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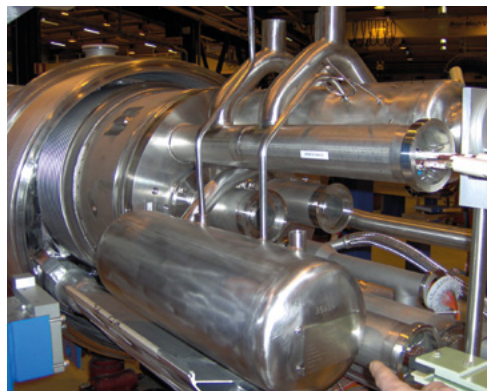
Turnover:

Velmon Lastechniek BV 1,3 M€ | 10 employees

Turnover:

Velmon Group 4,5 M€ | 38 employees

www.velmon.nl



The background is a dark blue field filled with a dense, out-of-focus pattern of white and yellow binary digits (0s and 1s). Several bright, glowing lines in shades of blue and orange cut across the scene from the bottom left towards the top right, creating a sense of depth and digital connectivity.

5 REMOTE HANDLING SYSTEMS (FOR HAZARD AND INACCESSIBLE ENVIRONMENT)

REMOTE HANDLING SYSTEMS (FOR HAZARD AND INACCESSIBLE ENVIRONMENT)	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	System Supplier	R&D	Development	Engineering	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal							Software									
					Large	Small	Mechat.	Cryo	Vacuum	Electronics HW											
Active Space Technologies	S	automation; telemetry; space	03; 0207; 06	remote handling; thermal insulation				x	x	radiation hard	x		x	x	x	x		x	x		
Heemskerk Innovative Technology	s	remote handling and robots	110308; 1104; 0207; 1001	simulation; systems engineering; consultancy			x			x	x		x	x				x			
Tree C	S	virtual reality for robots; remote handling	1104;110308; 0207;1001	virtual reality; 3D simulation							simulation			x							

ACTIVE SPACE TECHNOLOGIES

Active Space Technologies is an SME incorporated in The Netherlands since 2004. We have been engaged in high added-value projects in two main areas:

- automated infrastructures;
- telemetry systems.

Our customers include the European Space Agency, TNO, and ITER.

PRODUCT INFORMATION

Infrastructure

Active Space Technologies specializes in automation and control, in particular for remote handling manipulation, automated operations, and logistics. We have sound experience in the use of Automated Control Vehicles (AGVs), robotic arms, electro-mechanical systems, complex operations, and programming (FPGA, PLC, wireless communications).

TELEMETRY

Whether it's in space or on firm ground, Active Space Technologies deals with harsh environments (temperature, radiation, high pressure, among other critical conditions). In order to meet this market need, we use and install smart sensors capable of measuring flow, temperatures, strain, and pressure while withstanding the most adverse conditions. These self-sufficient smart sensors are capable of harvesting energy and encrypting data, and can communicate both via wired cable and wireless.



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INSULATION

Active Space Technologies further commercializes Aerogels – Aeroflex© – which was originally designed for super insulation applications in space. Aeroflex© can be used both for thermal insulation (cryogenics and pipelines) and absorption (oil & spill and organic contaminants from wastewater).

Its proprieties are the following:

- **Thermal conductivity:** 35 mW m⁻¹ K⁻¹
Highly hydrophobic
- **Porosity:** 93 - 97%
Low density - < 80 kg m⁻³
- **Operating temperature:** -200 to 350oC



HEEMSKERK INNOVATIVE TECHNOLOGY

Heemskerk Innovative Technology offers strategic and operational consultancy in the areas of robotics, mechatronics and high-tech systems, and primarily targets the European institutional market.

EXPERTISE

High-tech systems often consist of several technical disciplines that require cross domain overview for all life cycles of the system. The system engineers in HIT are experienced engineers who have become skilled within different technical domains throughout their careers.

INNOVATION MANAGEMENT:

- Systems Engineering
- Engineering Audit
- Peer Review
- Design Review

REMOTE HANDLING COMPATIBILITY AND MAINTENANCE ANALYSES

A Remote Handling Compatibility Analysis (RHCA) determines whether and how to maintain a component. This analysis can be carried out in several stages of a development.

- Determine the maintainability of systems in preparation of formal design reviews
- Validate maintenance plans using Virtual Mockups
- Analyse accessibility for inspection and maintenance
- Improve human safety, ALARA
- Analyse strategies to maintain large and heavy components

COOPERATION

HIT has extensive experience with International collaboration, Consortium formation and Proposals

REFERENCES

ITER IO – F4E– JADA– KoDA – Jacobs – NWO

Institute DIFFER - OTL – Vitrociset

TNO –ESS – Fagerstrom– NRG – Airbus DS – VDL

APTS



Dr. Ir. C.J.M. Heemskerk

Managing Director

Merelhof 2

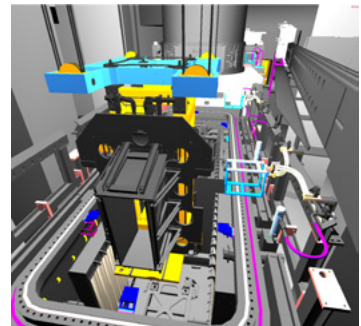
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Turnover: 600.000 € | 9 employees

www.heemskerk-innovative.nl



TREE C TECHNOLOGY

Tree C Technology BV develops 3D simulation technology and builds advanced simulators for training, procedure design- and validation, remote handling and research. We serve a wide range of international clients in the maritime, offshore construction, oil & gas, heavy lifting, dredging, nuclear and related industries as well as a large number of universities.

PRODUCT INFORMATION

The success of REMOTE HANDLING will be a key factor in the safe exploitation of fusion energy. VR4Robots® offers the best combination of interactive visualization and remote handling technology to prepare and execute the demanding RH-tasks in ITER.

VR4Robots® enables you to define, visualize, animate, simulate and interact with robots and manipulators in a virtual world. The environment may include digital mockup's based on 3D CAD data. Complex 'behaviours' of robots, cameras, animations, movement constraints and collision properties can be added to the environment to improve realism. VR4Robots® is capable of handling the largest full scale mock-up facilities with the aim to prepare, demonstrate and execute remote maintenance, and to develop the remote

maintenance operating procedures to facilitate development of components.

REFERENCES

- DIFFER (Dutch Institute For Fundamental Energy Research), NL
- JET (Joint European Torus), UK
- (image Remote Handling Control Room, courtesy of Oxford Technologies, Ltd)
- QST Japan
- Veolia Nuclear Solutions (UK)
- UKAEA – European Spallation Source
- Institute for Plasma Research, India

MAIN MARKETS

Remote Handling engineering validation and remote maintenance monitoring in Fusion Research, Nuclear Decommissioning, Site Reconstruction etc. Advanced physics simulation and monitoring for Oil&Gas, Offshore, Dredging, Fusion and Fission industry.



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VR4Robots



6 DETECTORS AND SENSORS

www.bigscience.nl

DETECTORS AND SENSORS	Company size	Speciality (USP)			Area							Service	Supply	Development	Engineering	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal												
						Large	Small	Mechat.	Gyro	Vacuum	Electronics HW	Software					
Amsterdam Scientific Instruments	S	particle and photon detectors	070103; 0301	hybrid pixel detectors					x	x					x	x	x
Cosine Measurement Systems		measurement	08; 07; 03	cameras; optics; sensors; X-ray					sensor networks	x					x		x
Nedinsco	M	photonic system design and production	08; 05; 03	optics; mechanics; electronics; sensors		x						x	x			x	x
Optics11		fiber optic sensing for condition monitoring	0802; 080402; 080407	acoustic emission; temperature; strain; acceleration; pressure								x				x	x
Peter Haak Produkt-ontwikkeling	V	high performance sensors and instruments	0250; 0290; 0350; 0450	sensor design and development; training; service		x			analogue	x		x			x	x	
Photonis		versatile customized or standard detector tubes	070402; 0803; 080305	MCP-PMT; HPD; image intensifiers; streak tubes; cricket								x		x	x	x	
Single Quantum	S	single infra red photon detector systems	0704	superconducting nanowire single photon detectors			x		x	x		x	x	x	x	x	x
Somni Solutions		high-end fiber optic sensors and sensor systems	02; 05; 0802; 0402; 0407	tailored monitoring applications with fully passive sensors					x	x			x			x	x

AMSTERDAM SCIENTIFIC INSTRUMENTS

We offer you the benefits of cutting edge detector technology developed by the Medipix collaboration lead by CERN.

Our customer-focused team consists of scientists and engineers with a vast global experience covering all aspects of particle detector technology. We close the gap between innovation at the frontier of science and ready-to-use products for science and industry.

PRODUCT INFORMATION

Our Timepix hybrid pixel detectors can be used in a wide range of applications.

Besides X-ray imaging, ASI detectors are used for precise spatially resolved detection of electrons, neutrons and heavy charged particles. We also offer our detector in a vacuum compatible system.

Conventional detectors use a counting method. We offer clever pixels: every pixel can operate in three different modes. These are counting mode, time-over-threshold and time-of arrival mode.

For more information on our products, please visit our website: amscins.com or write us an email: info@amscins.com.

REFERENCES

Nikhef, NL – AMOLF, NL – Reactor Instituut Delft, NL – Royal Adelaide Hospital, AU – Tribogenics, USA – Brookhaven National Laboratory (BNL), USA – Princeton Plasma Physics Laboratory (PPPL), USA – Stanford (SLAC/LCLS), USA



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10 employees

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COSINE MEASUREMENT SYSTEMS

ABOUT COSINE

Cosine develops and builds optical and distributed measurement systems for its customers.

COSINE HAS EXTENSIVE EXPERIENCE IN

- multi-sensor hyperspectral, infrared and 3D imaging measurement systems
- X-ray optics
- distributed sensor networks

The systems of cosine are used in space, on aircraft, on drones, in the field and in the factory.

The cosine team develops transparently in close collaboration with the customer.

APPLICATIONS

- **Space & Aerospace:** Miniaturized instruments for remote sensing, precision agriculture, water and air quality
- **Agri, Food & Pharma:** Inline non-destructive quality and safety inspection
- **Safety & Security:** Detection of features not visible to the human eye

OUR CUSTOMERS

Cosine customers range from small high-tech companies to large industries and organizations.

SOLUTIONS READY TO ADOPT

- CONDI® Continuous optical non-destructive inspection systems for inline inspection
- SPO® High-energy optics for space, beam lines and material analysis
- 3D-One® camera systems for multi-camera hyperspectral imaging in the visible and infrared
- a complete product line of miniaturized remote sensing systems for space and aerospace

For more information about our products and services visit our website cosine.nl

cosine | measurement systems

Prof. dr. Marco Beijersbergen

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NEDINSCO

Nedinsco develops, designs and produces a broad range of photonic technology based systems for high-tech applications. Nedinsco has many years of experience providing customers sophisticated systems consisting a combination of optical, mechanical and electrical technologies. Strategic partnership is a key concept in Nedinsco's approach to contemporary as well as future business.

Nedinsco has many years of experience providing customers sophisticated systems consisting a combination of optical, mechanical and electrical technologies. Strategic partnership is a key concept in Nedinsco's approach to contemporary as well as future business.

CAPABILITIES

With our extensive engineering and production knowledge and our state-of-the-art facilities we are providing customers with state-of-the-art and cost effective photonic based systems enabling them to become more successful.

Goal is to deliver qualified serial products and being able to manage the complete lifecycle of the

product starting with a basic idea of the customer until the service and aftersales.

PRODUCTS

Camera systems, spectrometers, photonic sensors, alignment telescopes, sensor platforms, bore sighting and training systems.

MARKETS

Diagnostics (medical, pharmaceutical, forensic, recycling and food branches), semiconductor and defence.

REFERENCES

ASML – TNO – Carl Zeiss – Saab Defence and Security – FLIR



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Manager Marketing & Sales

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OPTICS11

Optics11 is a high-tech company that offers fiber optic sensing systems for condition monitoring, structural health monitoring and non-destructive testing. The unique expertise in interferometry, FBG interrogation and transducers design allowed the company to develop over the years the world's broadest sensors portfolio in the fiber-optic market. To date Optics11 sensors and systems are deployed in high voltage assets, nuclear facilities, wind turbines, high-speed trains, deep-sea measurements, mines, bridges, border monitoring and R&D.

PRODUCT INFORMATION

Fiber optic sensors outperform electrical sensors in challenging operational environments, such as strong electrical or magnetic fields, high radiation, extreme temperatures or in liquids. Optics11 brings the benefits of fiber optics to industry by delivering complete sensing solutions (sensors, acquisition units, software), enabling monitoring and measurement in any challenging environment.

Optics11 has extensive experience with monitoring Acoustic Emission, Temperature (including cryogenic), Strain, Acceleration, and Pressure. All Optics11 systems embrace innovative measurement techniques that allow to overcome most of the drawbacks and limitations of classic fiber-optic sensing systems such as limited bandwidth, limited sensitivity, and bulky sensor size.



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PETER HAAK PRODUKTONTWIKKELING

High Performance Sensors and Instrumentation

PRODUCT INFORMATION

Our core business is the development of high performance sensors and instrumentation for scientific and industrial applications, with over 20 years experience in this field. Our expertise is primarily based in the analog electronics domain, with an emphasis on low frequency and low power. For projects that may require any external expertise, we work with a broad network of specialists, e.g. in the field of physics, data processing algorithms or ASIC design, in order to provide you with an optimal solution.

We spend substantial resources on evaluating new technologies and constantly engage with professionals from neighbouring fields to be prepared for future inquiries. Regular participation in product definition and testing of “early samples” for leading component manufacturers and exchanging the test results and insights, enables us to go “far beyond the datasheet” and push the limits with confidence.

Due to our efficient way of working we can respond quickly to customer requests, and as such we can offer rapid prototyping and notable flexibility when it comes to last minute changes.

peter haak produktontwikkeling

Peter Haak

Director

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Our solutions are used in the semiconductor industry, in scientific research (ultra-precision current measurement, cryogenic reference thermometry), healthcare (EEG, in-vivo measurements) and other sectors. Typical examples include: thermal sensors with μK stability, magnetic and capacitive sensors for sub- μm positioning, highly sensitive hybrid optical detectors, sensors for mHz range noise cancellation.

CORE EXPERTISE

- high resolution and low noise circuit design: discrete, IC-based or “composite” designs and hybrid circuits
- solutions for signal integrity in a real life environment: think of 1/f noise, popcorn noise, thermal EMF
- extensive knowledge of electronic components, materials and processing, circuits and systems

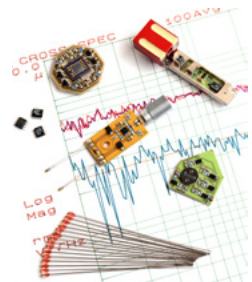
SERVICES OFFERED

- product development: concepts, analysis, design, prototyping, qualification
- consultancy: component and circuit advice, technology reports, reviews
- training and support with emphasis on implementation

REFERENCES

From small enterprises to large companies and institutions, including:

ASML – CERN – Vistec (Leica) – SKF Research – Philips Healthcare – TNO – Nedap – Heidenhain – NXP – ABB – Shell



PHOTONIS

Photonis is a key partner for researchers in experimental physics. We are one of the global leaders offering a very wide range of detectors for charged and neutral particles. Our photo-sensors cover a large part of the spectrum with custom adapted high sensitivities and resolution parameters that can help solve challenging problems for your specific research project. We offer sensors and detectors for almost all physics and analytical research, both for detection and imaging applications, measuring electrons & ions, neutrons & gammas, Cherenkov photons, fluorescence and scintillation light, and laser & plasma emission, for example.

For decades, Photonis has been an essential development partner in providing innovative solutions for space applications. Photonis' support of the exploration missions in space is unparalleled. We have partnered with industry leaders, researchers and space agencies around the world to create innovative custom solutions to focus or collimate X-rays, identify compositions of asteroids and planetary atmospheres, observe behaviours of weather, solar winds and auroras, categorise solar flares and discover distant planets, gamma ray bursts, black holes, and galaxies.

Our R&D, Engineering and Program Management teams work every day on our current product line, as well as innovative new technologies and solutions. These developments are extremely important to ensure that we can offer our customers the best possible products

We cherish all our relationships and customers around the world. To best serve them, our global sales team answers all questions with support from our Business Development team, Back Office team and Marketing and Communications professionals. Thanks to the efforts of our global team, we have sold the CERN professors to the special forces of all NATO countries and participated in several space missions.



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www.photonis.com/contact

SINGLE QUANTUM

Single Quantum provides single photon detector systems for the most demanding scientific and industrial applications in the near and mid infrared. We offer reliable and easy to use complete detection systems, based on superconducting nanowire single photon detectors (SNSPD).

ABOUT US

Early 2012, Single Quantum was established as a spinoff from the Delft Technological University and scientific research funded by FOM and NWO. For wavelengths in the near and mid infrared, Single Quantum offers the best single photon detectors in terms of detection efficiency, noise levels, time resolution and reliability. We are the first company offering a complete SNSPD system with a built-in cryogenic cooler, which has the advantage of not requiring any external liquid helium supply.

PRODUCT SPECIFICATIONS

Timing jitter: 50 ps – Dead time: <10ns – Spectral response range: 0.2-2 μm – No afterpulsing, no gating necessary



SINGLE QUANTUM

Dr. S.N. (Sander) Dorenbos

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QUANTUM EFFICIENCY

Wavelength (nm)	Dark count rate (/s)	Quantum Efficiency (%)
800	<100	18
1310	<100	28
1550	<100	10

APPLICATIONS

- Single quantum dot spectroscopy
- Photon correlation measurements
- CMOS defect analysis
- Optical quantum computing
- LIDAR
- Free space communication
- Time-resolved fluorescence measurements
- Quantum key distribution
- Optical coherence tomography

REFERENCES

Heriot-Watt University –
Hokkaido University – Stockholm University – Bristol University



SOMNI SOLUTIONS

Somni Solutions designs, develops and manufactures high-end fiber optic sensors and sensor systems. The product portfolio includes various sensors, such as pressure and temperature sensors, but also accelerometers, tilt sensors and hydrophones. All sensors are fully passive, i.e. there is no electronics inside the sensor for the operating principle is based on fiber optic technology.

PRODUCT INFORMATION

Somni takes great care of the reliability and robustness of their fiber optic sensors. Customers often use these sensors in harsh (high pressure and temperature) environments which is often difficult to reach. The reliability of the sensor at such remote locations operating under harsh conditions asks for sensors which have an outstanding quality and reliability. Therefore, Somni Sensors are extensively tested both in the lab and in the field under the most harsh conditions to ensure the quality our customers expect from a Somni Sensor.

MARKETS

Somni Sensors are used in a wide variety of markets and applications. The Somni standard sensor portfolio is often used for Structural Health Monitoring of for example bridges, overpasses, and tunnels. But also rail track and pantograph

monitoring are applications which are often addressed by Somni Sensors. Tailored sensor developments are often requested in the oil and gas market, medical market and for some specific defense applications.

CAPABILITIES

- Fiber optics
- Physics
- Mechanical engineering
- Industrial design
- Prototyping
- Calibration/ verification
- Production



Remco Nieuwland

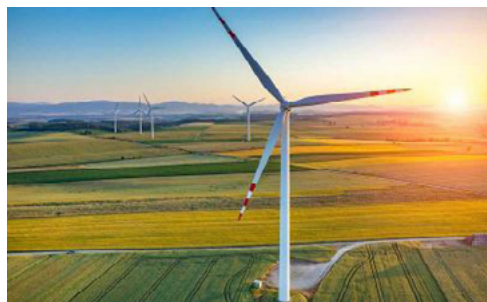
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The background is a dark field filled with numerous thin, curved, teal-colored lines that create a sense of motion and depth. Scattered throughout these lines are many small, bright teal dots, some of which appear to be at the ends of the lines, giving the impression of a network or a complex system.

7 CRYO AND LOW TEMPERATURE

CRYO AND LOW TEMPERATURE	Company size	Speciality (USP)			Area							Service	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal						Software		
					Large	Mechat.	Cryo	Vacuum	Electronics HW				
												Production / Assembly	
													Engineering Development
													R&D
													System Supplier
													Technical Consultancy
													Systems Engineering
													Project Management

CRYOWORLD BV

Cryoworld BV is a manufacturer and designer for cryogenic, vacuum insulated equipment. Our company is based on extensive experience in both theoretical as well as practical field. Our core business is design, production, testing and installation of helium and other custom designed cryogenic equipment.

In our spacious production facility our dedicated engineers and specialists make sure every project meets the highest quality standards. Cryoworld specializes in the development of new cryogenic technologies and delivers projects to renowned companies and scientific institutes worldwide.

CRYOWORLD IS THE INNOVATION SPECIALIST FOR:

- Liquid Helium components and systems (transfers lines, semi flex cryostats, dewars, valve boxes and syphons)
- Liquid Hydrogen components and systems
- Valve boxes liquid nitrogen
- Phase separators
- Special Cryostats
- (Exhaust) gas heaters, also sub-atmospheric
- Vacuum dryer conditioning equipment
- Special cooling systems
- Cryogenic shrinking
- Systems for cryogenic mass production
- LNG equipment and transfer lines
- Cryogenic specials
- Custom built valves
- Vacuum jacketed flexible hoses



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If you are looking for a company that is willing to solve your cryogenic challenges and is able to develop new technologies, consult Cryoworld BV. Our cryogenic specialists have earned their spurs through many years of experience in complex helium-, nitrogen- and special cryogenic systems and known for their advanced and efficient solutions.

OUR CAPABILITIES:

- Process design for cryogenic equipment down to 1.8 K
- Mechanical design of valve boxes
- Structural analysis and seismic loads calculation
- Equipment for component leak testing including helium leak testing at relevant sensitivity (1E-9 mbar l/s). Level 2 ISO 9712:2012 certified
- Integration of instrumentation and control
- Innovative design, cryogenic prototyping
- Accurate sensing and controlling of cryogenic processes, level, flow, pressure and temperature
- Experience in design, manufacturing and testing of pressure equipment according to relevant standards (EN-13445, EN-13480 or ASME equivalent)
- Welding inspection and leak testing
- Suitable facilities for carrying out satisfactory welding work for development and manufacturing
- Manufacturing in clean area for assembly, testing, including facilities for cleaning and vacuum processing to the necessary standards
- ISO 9001:2015 Certified

SOME REFERENCES

Cern – Linde Kryotechnik AG – Air Liquide ALAT – GSI Darmstadt – Triumf - Merck Helmholtz Zentrum Berlin – Radboud University (HFML lab) – IPP- ASML- Research Instruments RI

DEMACO HOLLAND BV

IF YOU ARE LOOKING FOR...

- Support in Cryogenic Engineering
 - Cryogenic expertise in manufacturing and installation of your Cryogenic Infrastructure like
 - Helium Transfer Lines
 - Helium Distribution Valve Boxes
 - Helium Interconnections between your facility and the storage tank or liquefier
 - Cryostats
 - Liquid Nitrogen Systems
 - Optimisation or Modification of your existing Cryogenic Infrastructure
- ... please don't hesitate to contact us and send us your enquiries. It will be our pleasure to provide you with a suitable proposal with your Cryogenic Solution.

Demaco is the leading knowledge driven cryogenic infrastructure partner for industrial gas companies, scientific institutes and EPC contractors world-wide. Our team of cryogenic specialists, Cryogeniuses, is committed in supporting our partners in their daily effort to transport and condition all liquefied gasses. By advising on, designing, engineering, manufacturing, testing and installing customer specific vacuum insulated solutions of superior quality we continuously provide the highest yielding infrastructure in the industry.

REFERENCES

CERN

- Multiple Helium Transfer Lines for LEP, LHC, ATLAS and CMS
- UHV-chambers for LEP separators
- Helium Siphons
- Liquid Argon Valve Box

DESY

- HERA-by-pass Helium Transfer Lines
- Bunch Compressor bypass pipelines I and II
- Helium Valve Boxes and Transfer Lines for the X-FEL Test Facility
- Extension for the TTF Transfer Lines

ESA

- Main Valve Boxes for the LSS Satellite Test Facility
- LN2 Transfer Lines and Phase Separators

Triumf – NSRRC

- ESRF – KIT
- GSI – ITER
- PSI – ISRO
- NIKHEF
- Helmholtz –
- Max-Planck



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STIRLING CRYOGENICS BV

Stirling Cryogenics BV is the world's leading manufacturer of cryogenic cooling systems. More than 3,000 systems are in operation across the globe, often in extremely demanding conditions. The reliability and durability of our Stirling cryogenerators has resulted in an unbeatable reputation.

We are a subsidiary of Hysytech Srl (www.hysytech.com) from Turin Italy. Hysytech specializes in gas purification technologies. Together we develop several systems for purifying and liquefying natural gas (LNG) and biogas.

A Stirling Cryogenics cooling system is an indispensable piece of equipment in those situations where constant cryogenic cooling is crucial (from 15K – 100K), independent of bulk liquid logistics. All of our cryogenerators are based on the (reversed) Stirling thermodynamic cycle and have a long history, highly reliable performance and efficiency.



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TYPICAL MARKETS THAT WE SERVE:

- Research Institutes and Universities
- Bio-storage (e.g. semen, blood, bone, skin, seeds etc.)
- High Temperature Superconductors (HTS)
- Space simulation chambers
- LNG/Bio-gas (re-) liquefaction
- Nuclear cooling
- Space Observatories
- Healthcare

Interested? Then contact us!





8

(ULTRA) HIGH VACUUM SYSTEMS AND LEAK DETECTION

(ULTRA) HIGH VACUUM SYSTEMS AND LEAK DETECTION	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	System Supplier	R&D	Engineering Development	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal															
					Large	Small	Mechat.	Cryo	Vacuum	Electronics HW	Software									
Hositrad Vacuum Technology	S	ultra high vacuum and cryogenics	0601; 0602	customised systems; standard equipment; repair				X	X							X			X	X
Mogema 3.0	M	complex and large vacuum systems	06; 0504; 050404	precision machining; assembly; welding	X		X		X							X		X	X	X
Vacutech		ultra high vacuum and cryogenic systems	0601; 0602	customised systems; engineering; manufacturing				X	X							X			X	X
Vacuüm Specials	S	ultra high vacuum and cryogenic systems	0601; 0602	customised systems; engineering; manufacturing				X	X							X			X	X
Vernooy Vacuum Engineering	M	ultra high vacuum and cryogenic systems	0601; 0602	customised systems; engineering; manufacturing	X	X			X										X	X

HOSITRAD VACUUM TECHNOLOGY

Hositrad Vacuum Technology combines more than 45 years of experience in vacuum and cryogenic technology. We supply standard vacuum parts CF, KF and ISO components from stock.

PRODUCT INFORMATION

Hositrad Vacuum Technology

- Have capabilities covering all areas starting from a standard flange up to designing a complete vacuum system,
- Manufacturing, repair and after sales service of vacuum equipment
- Experts in TIG-Laser and Microplasma welding en He. leak testing $<1 \times 10^{-10}$ mbar l/sec.
- Laser welding for medical devices and clean technologies
- Own production and an AutoCad design in Holland and in the Far East
- "Custom made specials" according to customer drawing in our workshop
- Supply the following products: CF-KF and ISO vacuum components – Electrical/Linear/Rotary Feedthroughs – Edge welded bellows – Isolators – View ports – Fiber Optics – Glass to Metal seals – Manipulators – Ferrofluidic feedthroughs – All Metal Valves – Angle Valves – Gate Valves – Diode Ion/Triode pumps and Titanium sublimation pumps – Cryopumps – Cryostats



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Turnover: 4 M€ | 10 employees

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HOSITRAD VACUUM TECHNOLOGY REPRESENT

- **Ceramtec:** Ceramic-to-metal sealing technology. Hermetically sealed electrical & optical components include D-type/circular feedthroughs, multipin connectors, coaxial connectors, thermocouples, isolators, viewports and accessories. These components are ideally suited to support optical, gas, liquid, power, instrumentation and sensing applications.
- **ColdEdge Technologies:** provides custom $<4K$ to 1000K closed cycle cryostats with interfaces.
- **Extrel:** Extrel is the world's leading manufacturer of Research and Proces Mass Spectrometers, Residual Gas Analyzers (RGA's), Quadrupole Mass Spectrometry Systems and Components from 1-100 amu to 16000 amu
- **Thermionics:** Manipulators, Valves, E-Guns, Ion Pumps, MBE Systems, Mechanical feedthroughs.

REFERENCES

CERN – DESY (XFEL, EMBL, Hasylab Hamburg) – Helmholtz Zentrum Berlin (Bessy, HMI) – FZ Jülich – GSI Darmstadt – KIT Karlsruhe, GKSS – DLR – IPP Garching – PSI Villigen – ESA Noordwijk – ESRF Grenoble – ALBA
Barcelona – FOM-Nikhef
Amsterdam – FOM
Nieuwegein and all Universities and Research Labs in Europe.



MOGEMA 3.0

The combination makes the difference

Mogema 3.0 is high-tech expert in welding, machining and vacuum technology. This unique combination of activities is what makes the difference: we are your partner right through from development up to and including delivery of the complete module.

We specialise in complex and large vacuum chambers and vacuum systems. Our expertise in welding, machining and assembly comes into its own for the manufacture of vacuum chambers.

PRODUCTION TECHNIQUES

Precision welding

- Wide choice of materials
- Broad range of sizes over 9000 mm
- Specialized production

Advanced machining

- Extreme accuracy to within hundredths of a mm
- Acclimatized production
- Enables highly accurate machining

Critical assembly

- Meeting every need

Our commitment to innovation and our belief in the importance of ongoing development is reflected in our investment in new techniques and expertise, as well as our partnerships with scientists and involvement in academic projects.

mogema3.0



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VACUTECH

For almost 30 years we have been manufacturing and assembling vacuum technology and precision engineering products at the highest level for various industries. For our clients and ourselves only absolute precision and the highest quality are good enough.

CREATIVE PRECISION SOLUTIONS

Another characteristic of Vacutech is that we always focus on solutions. The word 'impossible' is not part of our vocabulary. With passion for our specialism as our basis, we see it as a challenge to come up with inventive solutions for complex assignments. Whether it relates to a single component or a complete composition or sub-composition.

Working together the way you prefer Vacutech has everything it requires to carry out your assignment successfully. From design, purchasing, manufacture and assembly right up to functional testing: we can take care of the whole process for you. But you can also call us in for just one of these specific processes and, if necessary, we will bring in the expertise of third parties. It is up to you to decide how we work together.

Our professional skills make the difference!

We are a reliable and constructive partner for every client due to our know-how and commitment. For manufacture and assembly, we have access to experienced skilled staff and extensive production facilities.

DISTINGUISHING FEATURES OF VACUTECH

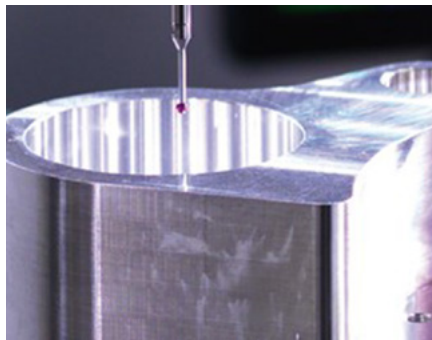
- Vacuum technology
- Cryogenic technology
- Manufacture
- Assembly
- Innovative approach
- Solution-oriented help
- Utmost precision
- High quality



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VACUÛM SPECIALS

Vacuüm Specials BV is specialised in the implementation, construction, manufacturing of components and subsystems and the realisation of complex projects on a turnkey bases regarding Vacuum technology and Cryogenic Applications.

Vacuüm Specials prefers to work in a "Partnership" relation rather than in a strict Customer – Supplier relation.

Vacuüm Specials BV originated from the Vacuüm Specials branch of Leybold BV in The Netherlands and obtained independent status from 1 July 1997.

From its establishment in 1975, Vacuüm Specials has delivered – both in Holland and abroad and to the fullest satisfaction of its customers, a variety of projects, resulting in an expertise in the field of vacuum technology and cryogenics applications.

All company processes take place following fixed procedures in accordance with ISO 9001:2008. After having prepared a tender followed by the acceptance of a purchase order, project progress is set out in consultation with the customer in a project planning.

Hereafter engineering takes place, in close cooperation with the customer, using SolidEdge or AutoCAD. Exchange of drawing files and project communication takes place by means of E-mail.

After the drawings have been approved by the customer, production commences where quality monitoring is an ongoing process.

REFERENCES

Nuclear Gas Industry (pump sets, leak testers, production machines, automatic LN2 fillings systems) – ESA/ESTEC and TNO (space simulation chambers, thermal vacuum systems and LN2 filling systems) – ASM (special spool pieces and traps) – Omicron (Liquid Helium Cryostats for low temperature scanning Probe Microscopes) – Oerlikon Leybold Vacuüm (Chambers and special products) – Mapper Lithography (chambers and special products) – Zeiss (special products) – Linde (LHe transfer lines) and DCA Finland (UHV Chambers up to 1000COF.



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Turnover 2.1M€ | 13 employees

www.vacuumspecials.nl



VERNOOY VACUUM ENGINEERING

Vernooy is a vacuum systems specialist with a long history in manufacturing vacuum and leak tight chambers and precision parts for in and around vacuum systems. Our vacuum systems are used in many high tech applications all over the world ranging from semiconductor and solar systems to highly specialized (large) research systems like particle accelerators. With our in depth knowledge of vacuum systems we constantly improve our manufacturing procedures to create the best vacuum.

Our expertise are:

MANUFACTURING OF HIGH-TECH PARTS AND WELD ASSEMBLIES.

We have highly skilled employees who understand the importance of clean manufacturing and the effect it has on our end-user processes. In our state of the art cleaning facilities we clean all our products. After cleaning the parts are extremely clean and can be used without additional processing in vacuum and cleanrooms.

ENGINEERING FOR MANUFACTURING

Vernooy Vacuum Engineering manufactures many special shaped weld assemblies for a variety of markets and research institutes. We use our expertise of design for manufacturing to decrease the production time and cost for our customers.



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Member of Masévon Group

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HIGH TECH MATERIALS WELDING

Our welding capabilities are not limited to stainless steel but also include aluminium and titanium welding. We are constantly improving our skills through internal research programs and optimize the precision in our welded end products.

MACHINING

In-house we are capable of machining precision products ranging from cm³ to several m³. We have produced chambers up to 5 m in length and 2.5 m wide for the solar industry but also small tubes for high end electron microscopes. Together with our customers and suppliers we aim for an optimized design both in costs and in lead time.

VACUUM QUALITY AND CONTROL

At Vernooy Vacuum Engineering quality is taken very seriously, all vacuum related parts are leak tested individually. Upon request the individual parts and weld assemblies can be tested at the targeted end vacuum level and RGA test. Weld assemblies are checked with a 3D measurement system.





9 INSTRUMENTATION & CONTROL

INSTRUMENTATION & CONTROL	Company size	Speciality (USP)			Area							Service	Systems Engineering	Technical Consultancy	Supply	System Supplier R&D	Development	Production / Assembly Engineering	Test & Measurement
		Large	Small	Mechat.	Gyro	Vacuum	Electronics HW	Software											
		ACQ Engineering	S	information technology	030411; 0207	electro mechanical automation		x			ADC; DAC; I/O	embedded	x	x	x	x	x	x	x
Actemium E&A	L	information technology	030411; 02	electro mechanical; PCB design		x			Digital	x	x	x	x		x	x	x	x	
AR Benelux		electronics and radio frequency	0305; 0350; 0210	test and measurement					x				x			x		x	
DotX Control Solutions BV	V	electronic controls	020701; 03	simulation; measuring and control					x	x						x	x		
Hitec Special Measuring Systems	S	current measuring	0350; 0350105; 03500108	AC and DC high current measuring													x	x	
INCAA Computers	s	electronic equipment; turnkey systems; HPC	0207; 0305; 035002; 0210	customised systems; data acquisition; power					automation	embedded					x		x	x	
Omics2Image	V	imaging detectors for analysis	03500405; 0902	detectors for mass spectrometry						x					x	x	x	x	
S&T	S	data analysis software	0207; 0350; 04	simulation; monitoring and analysis system health					x	modelling					x		x	x	

ACQ ENGINEERING

AcQ Engineering develops, produces and delivers safe and reliable embedded solutions. At AcQ Engineering, we provide quality for the right price, regardless of whether you are a small company or an aerospace giant.

Our embedded electronics are used in a wide range of applications: aerospace, military, test & measurement, transportation and industrial automation. We are experts in safety critical applications and rugged designs.

PRODUCTS AND COMPETENCES

AcQ Engineering is able to cover all aspects of a development process and product life cycle:

- requirements capture,
- product design and development,
- testing (incl. environmental),
- integration,
- production (if desired),
- support and
- obsolescence management.

If required, we can complete your projects up to the highest safety standards.

REFERENCES

Airbus – Alstom – Fokker – Liebherr – Danieli Corus



Jeffrey van Grunsven

CTO

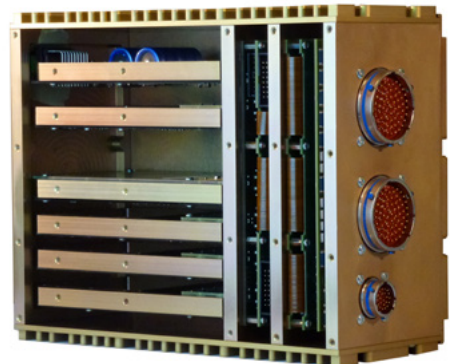
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ACTEMIUM E&A

Actemium E&A is specialist in Controls, Printed Circuit Boards (PCB), Electronic units, Controlpanels, Machine and Modules for the high tech Industry.

Actemium is a tradename of VINCI Energies and consists of a network of cooperating VINCI Energies companies which delivers their products and services to the industrial market.

Actemium advises, supports industrial customers in the construction, optimization and maintenance of their industrial production facilities.

PRODUCT INFORMATION

The core competence of Actemium E&A is the development, engineering, production and testing of high tech electro (mechanical) systems and PCB's (printed circuit boards).

Customers of Actemium E&A can be found in Medical, Electronics, Lighting, Optical, Semiconductor, Military, Solar & Energy, Food, Feed, Chemicals, Logistics and Science.

OUR CAPABILITIES SUMMARIZED

- Machine control.
- Mechatronics Measuring and testing systems.
- Module and Panel Construction (prototypes and serial).

- (Power) Control Cabinets, Own panel shop for building control cabinets include UL panel shop.
- PCBA (printed circuit boards assembly) Own inline PCBA production for proto and serial production.
- Prototyping Engineering include Embedded software.
- Cleanroom, CE certification, Supply Chain Management, QMS, After Sales (repair and spare)

PROJECT REFERENCE EFDA

Actemium built four full Control Cabinets include Modules and PCBA's for the new high voltage supply units (160.000V, 130A) for the Joint European Torus (JET) project of UKAEA in Culham-United Kingdom

The improved supply units will be used to facilitate a higher energy output of the Torus (50 – 70%).

REFERENCE

Philips – ASML – NXP – Bosch – Canon – Kema – TNO – Vialis – Moba – ASM – Tennet- S4energy -van der Lande industries – Mars – VDL group - Siemens – PANalytical – Nexperia - UKAEA and EFDA.



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Turnover: (M) € 130 | 850 Employees

www.actemium.nl / www.actemium.com



AR BENELUX

Specialists in test and measurement solutions from DC to RF

AR Benelux offers products from well established industry names including Teledyne LeCroy, Kepco and MITEQ. To compliment our standard of the shelf solutions we also provide custom solutions, a wide variety are offered ranging from AC/DC power supplies to special designed RF solutions.

EUROPEAN PARTNER

AR Benelux is part of the AR Europe group of companies which consists of the European AR offices in the Benelux, Germany, France, United Kingdom and sales associates across Europe.

PRODUCT GROUPS

- AC/DC Power
- Electrical Safety
- Oscilloscopes
- EMC
- RF/Microwave
- General T&M
- Custom Solutions



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DOTX CONTROL SOLUTIONS BV

DotX Control Solutions specialises in high performance control system development and the realisation thereof. Dotx Control Solutions has all the necessary expertise to make your product or production system into a success. Our strength lies in the unique combination of high-quality competences like software, mechanics, mechatronics, electronics, mathware and testing.

CORE COMPETENCES, EXPERTISE

High performance control design and tuning of both electromechanical and process control systems, prototype building, mathematical modelling.

PRODUCT INFORMATION

One of our main products is the PID Tuner (www.pid-tuner.com); this is software to tune PID controllers of any make in a systematic way, using system identification to create a model, and model based optimal tuning. The user does not need to be a control expert. This software is used world-wide, mainly in high performance control cases. Its application is not limited to slow processes, but it applies to any system, MIMO included.

MAIN MARKETS

Wind turbine industry, Process industry.

REFERENCES/CLIENTS

Pepsico – Tata Steel – EWT – Lagerwey BV –
Idemia – RHI Magnesita - Polpharma - Nouryon
– Dishman - VDL Weweler – Mitsubishi – LM Wind
Power – Synergy Systems BV



Dr. Ir. J. Schuurmans

Director

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Turnover: 0.2 M€ | 3 employees

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HITEC SPECIAL MEASURING SYSTEMS

Hitec Special Measuring systems bv develops and manufactures off-the-shelf and customer specific current measuring systems for AC and DC currents up to 50kA with scientific class accuracy and stability.

PRODUCT INFORMATION

Hitec Special Measuring System, part of the Hitec Power Protection Group, has a long and impressive history in developing and manufacturing of tailor made current measuring system for AC and DC currents.

Hitec was the first to introduce a revolutionary high precision current measuring system based on the Zero-flux principle.

The Zero-Flux principle enables galvanic isolated measurement of AC and DC currents with supreme accuracy, linearity and stability.

Many thousands of our systems have already been applied in High Voltage DC, Scientific and industrial applications.



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General manager

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Turnover: 5 M€ | 9 employees

www.hitecsms.com

REFERENCES

Science:

All major scientific research centers

High Voltage applications:

Most of the High Voltage Direct Current links

Industry:

Power metering/data logging, lithographic systems for semiconductor industry and medical imaging



INCAA COMPUTERS

INCAA Computers is a well-established company with over 45 years experience in design and manufacture of professional high-tech electronic equipment for industry, science, and OEM. We provide solutions for technical automation projects and take system responsibility.

PRODUCT INFORMATION

Applications extend from industrial and scientific scalable data acquisition systems through transient recorders, timing systems, superconducting magnet test benches and power supply control modules to alarm and safety systems.

Hardware Development:

Modules can be designed from scratch or standard modules can be tailored to customers specific needs. Characteristic product properties are the high quality level and the relatively small to medium production volumes.

Software Development:

Due to our in-house hardware expertise we know best to separate projects into hardware and software functions and how to interface them to

build innovative fail-safe systems. Specialisations include system software, databases and graphical user interfaces.

System Integration:

We not only deliver hardware modules and software packages but also integrate these with third-party components into complete functioning turn-key systems.

REFERENCES

Our client base includes a wide selection of international organisations and companies:

CERN – Sincrotrone Trieste – GSI – UKAEA – MIT – FZ Juelich – Alstom – ASML



Bart Sijbrandij

Project manager

Puttenstein 20

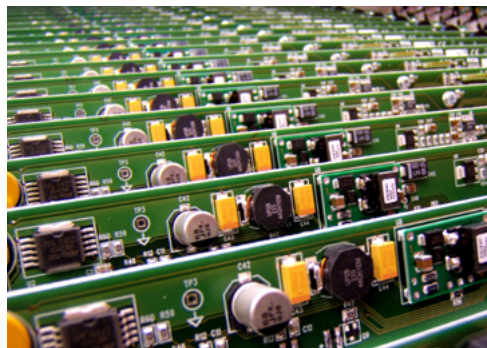
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We offer you the benefits of cutting edge technology developed by the Biomolecular Imaging Mass Spectrometry group of Prof.dr. Ron Heeren at Amolf.

Our customer-focused team consists of scientists and engineers with a vast global experience. We close the gap between innovation at the frontier of science and ready-to-use products for science and industry.

PRODUCT INFORMATION

With the IonPix camera molecular images are not constructed in a conventional manner point-by-point, but directly detected in the microscope mode.

Inside a mass spectrometer in a 100-200 micrometer area, molecules are isolated, ionized and accelerated with a particle beam or a laser. The new system leaves the spatial distribution of ions intact while they fly through the mass spectrometer. These ionized molecules are detected at the end of the flight tube, where arrival time and location are recorded. With the conventional detectors,

this was quite complicated or it simply proved impossible. The camera is based on a chip detector (Timepix) that has been developed for high-energy physics at CERN, for more information see the Medipix Collaboration. This technology produces all molecular images with a single laser flash. Each pixel in such a molecular picture compares to 500 nanometers of tissue, and in one experiment more than 250,000 spectra are simultaneously collected. This is a major improvement in resolution and measurement speed.

The AMOLF group has deployed this new form of molecular photography among others for breast cancer research.

REFERENCES

Nikhef, NL – AMOLF, NL – Netherlands Proteomics Centre (NPC), NL – Korean Research Institute of Standards and Science (KRISS), South Korea



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3 Employees

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Science & Technology (S&T) has more than 10 years experience in the development of data analysis software for both engineering- and science data. S&T's expertise is applied in a wide range of domains, including space and earth observation, astronomy, oil and gas industry, navigation, and high-tech machinery.

PRODUCT INFORMATION

The objective of S&T's data processing software is to extract as much information from sensor data as possible. The data processors systems are used to wide range of applications. These applications include (i) the extraction of scientific information from sensors such as Earth Observation sensors for atmospheric research and telescopes for space research, (ii) to derive an accurate estimation of a system's health so that imminent failures are recognized before they actual take place, (iii) to derive the exact positional information using various navigational sensors.

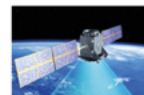
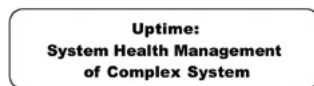
For System Health Management (SHM) applications S&T has developed the Uptime tool. This tool encapsulates the state-of-the-art SHM technology to avoid unnecessary downtime, alarm rate

reduction, fault diagnosis, and the prediction of imminent failures.

Our scientific data expertise focuses on the analysis of large science data-sets, data visualisation, simulation, the development of software-pipeline systems and calibration algorithms. The S&T expertise focuses on the (pre-) processing and visualisation of raw data and the generation of calibration key-data for level 0-1 and 1-2 data processors. In addition we develop user interfaces that allow quick-access to level 2 science and housekeeping data.

REFERENCES

System health management for the ESA future launcher rocket propulsion – calibration and data-pipeline activities for the LOFAR radio telescope telescope – ITER NL vacuum leak detection and localization – data quality control toolbox (Quadas) used for ground- and space segments for missions such as SWARM, CroyoSat-2, Galileo, Sentinel-1, Sciamachy – on-ground and in-flight calibration activities for various Earth Observation missions such as OMI, GOME, Sciamachy, and Tropomi.



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10 ENGINEERING METHODOLOGIES AND TOOLS

ENGINEERING METHODOLOGIES AND TOOLS	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	Supply		Development	Engineering	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal																
					Large	Small	Mechat.	CyO	Vacuum	Electronics HW	Software										
ACE ingenieurs & adviesbureau		mechanical engineering service	0590	R&D; systems; engineering			x						x	x	x	x	x	x			
Amstel Engineering BV	M	mechanical engineering service	0590; 06	system supplier; 3d design and drafting			x	x	x						x	x		x	x	x	
BKL Engineering		mechanical engineering service	0590; 1102; 1104	handling tools; test rigs			x			x		x				x		x	x	x	
EKB		production and process automation	0207	system integration			x			x		x		x	x	x		x	x		
Entechna Engineering		general engineering service	05; 02; 0590	R&D; systems; FEM, engineering, production			x			x		x			x	x		x	x	x	
JPE	S	precision mechatronics in vacuum; cryo	0590; 0690; 0601; 0602	precision eng; FEM; simulation; production		x	x	x	x		embedded				x	x	x	x	x	x	
Lencon	S	mechanical engineering	0590	opto-mechanical; FEM and simulation			x											x	x		
MECAL High-tech/ Systems	S	precision machines for semiconductor factories	0590	vibration isolation; support frames; ceiling mounted			x				embedded	x	x				x	x	x	x	
MI-Partners	S	innovative and mechatronic solutions	0590	simulation; vibration isolation; optics; modeling			x				embedded	x	x				x	x	x	x	
NLR - Royal Netherlands Aerospace Centre	L	systems expertise centre	03; 04; 05; 06; 07; 08; 09; 10	research infrastructure and facilities			x		x	x		x	x	x	x	x	x	x	x	x	
Settels Savenije	S	supply and R&D of high end systems	0590; 0207; 1305; 1214	engineering; simulation; modelling; mechatfysics			x		x	x		x		x	x	x	x	x	x	x	
Sioux Technologies		development complex high-tech systems	02; 03; 08	software; mechatronics; mathware; electronics; optics; assembly			x			x		x		x				x	x		
Tebulo Engineering BV	M	multi disciplinary mecha; electric projects	02; 0207; 03; 05; 09	engineering; production			x			an; dig; power		x					x	x	x		
TechMasters BV	S	industrial products, tooling, mechanisation	02; 0207	development; engineering; subcontracting			x		x				x					x	x		
TNO	L	general innovation partners	03; 04; 05; 06; 07; 08; 09; 10	optics; mechanics; electronics; nuclear	x	x	x	x	x	x		x		x	x	x	x	x	x	x	
VIRO	L	multidisciplinary mecha; electric projects	02; 0207; 03; 05; 09	systems engineering; FEM analysis; projects			x						x	x				x	x		

ACE INGENIEURS & ADVIESBUREAU

PASSION FOR TECHNOLOGY AND INNOVATION

ACE is ingenious. That means we work with inspiring, intelligent and passionate craftsmen. Every day our specialists combine their thorough knowledge with the ability to analyse from a different perspective.

Ingenious means analysing, developing, designing and realizing, with our customers' success as a starting point. It's the added value of individual competence, supported by a professional organization with vast expertise and experience. It also means believing and investing in a close collaboration in the chain and co-engineering with future constructing partners.

A completely transparent design process and an organization that connects to the needs and principles of our customers form the foundation of our company. That is why our services enable our customers to increase their competitive edge. Analysis and research, engineering at our premisses but also turn-key projects. We also provide individual specialists or if necessary complete engineering teams in addition to your own resources.

OUR SERVICES ARE GROUPED IN FOUR MARKET ORIENTED BUSINESS UNITS:

- product development
- industrial automation
- hightech systems
- construction technology

The engineers within these units know the market. They are up-to-date as far as technological development is concerned and have a thorough and specific knowledge in their field.

The culture of ACE has its roots in a constant thirst for innovation. However, always pragmatic and without losing sight of important parameters as costs and planning. That force has been recognised already for 35 years. By industry leaders but also by starting innovators and research organizations.

The long lasting relations with our customers confirm our vision on collaboration, creativity, professionalism and effectiveness. Be ingenious!



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AMSTEL ENGINEERING BV

In business for more 30 years, Amstel Engineering offers advanced Mechanical Engineering and Design services to customers to help them in developing complex mechanical designs and products. Our customers call on our expertise for the entire design cycle; from problem identification to a validated product.

ENGINEERING ON ALL LEVELS

Amstel Engineering's capabilities in providing solutions throughout the product development life cycle using conceptual design, industrial and mechanical engineering, CAD modelling and detailing, to simulation, analysis and prototyping, product testing and manufacturing. This makes Amstel Engineering a unique one-stop solutions provider for Engineering and Design Services. Clients can outsource their engineering work to Amstel Engineering, allowing them to focus on their core competences.

Amstel Engineering is flexible in the assignment scope as well as in its approach. Apart from turn-key solutions, we can also focus on a critical component of a machine or product to (re)design or evaluate. This can be done for reasons such as reducing cost, reducing time-to-market, increasing load capacity or extending the life span.

We are part of the Neitraco Group, a group consisting of 8 companies spread across the Benelux. Every company has its own specialization, allowing us as a group to tackle every engineering challenge in-house.

DEDICATED AND FLEXIBLE STAFF

We are staffed by professional engineers and designers with extensive experience and expertise in design and engineering in a range of industries. We focus on delivering technically accurate and scientifically sound solutions based on our training and industry knowledge. We understand that our clients sometimes want to have their engineers in-house. That is why our engineers can also work on-site.

REFERENCES

We have a proven track record of providing complete design and Engineering solutions for customers in sectors like Aerospace, Automotive, Rail, Scientific Research, Material Handling, Food Processing and Retail. These are some of the clients & partners we are proud to have worked with: ASML – ECN – Nikhef – ASI – ESA – Airbus Defence & Space – Sun Test Systems – Vacuüm Specials – TNO – NRG

WHAT DOES THAT MEAN FOR YOU?

When you partner with Amstel Engineering, you can depend on better value, faster delivery, superior products and services and a collaborative relationship throughout your project – as well as an engaged, expert partner for the life of your business.



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BKL ENGINEERING

ABOUT US

BKL Engineering enables its customers to bring their high-tech operations to the next level. For instance, in the case they want to introduce new products or services. To this end we develop specific solutions enabling our customer to work safer and more effectively.

PRODUCTS

As a specialist in mechanics and mechatronics we focus on:

- Handling tooling (a.o. hoisting / lifting tools)
- Special machinery (a.o. test rigs)

SERVICES

Our range of services include:

- Engineering
- Production
- Inspection & Service

SAFETY EXPERT (CE)

We have extensive experience in applying the machine directive. On request of our customers we can be held CE responsible for the tools they use. Furthermore, we are internationally ISO/IEC 17020 accredited to perform safety related inspections on specific hoisting and lifting tools.

REFERENCES

Amongst others: ASML – FEI and Philips



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ABOUT US

EKB is a system integrator for industrial automation projects. EKB provides automation solutions within the process and manufacturing industry with over 200 committed and qualified employees. A high quality system according to CSIA regulations and thorough project management make EKB a reliable partner.

EKB was founded in 1971 and has developed into a nationwide operating and well-reputed automation company with five branches in the Netherlands. EKB is also member of the listed TKH Group, an international operating group of companies in the field of Telecom, Building and Industrial Solutions making an annual turnover of more than 1 billion euro.

CORE COMPETENCES

EKB has extensive expertise in the following competences:

- Panel Building
- Motor Control Centers (TABULA)
- Robotics / Cobots
- Machine Vision

- Motion & Control
- PLC-SCADA
- High Performance HMI / Alarm Management
- MES-OEE
- Project Management
- Turn Key Automation Projects

MAIN MARKETS

EKB is active in the following markets:

- Food
- Metal
- Chemistry
- Energy
- Marine & Offshore
- Machine Building



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Commercial Manager

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ENTECHNA ENGINEERING

Entechna has been serving the high tech industry and academia with high-quality solutions in the field of mechatronics and mechanical engineering since 2010. Our extensive background in academic level Design Principles and experience with optical and electromagnetic systems allows us to quickly reduce complex problems to their essence. From here on we generate creative and innovative solutions without wasting time on symptom solving or losing sight of practicality and cost.

Our projects range from fast feasibility studies to extensive concept-to-prototype developments and turn-key instruments. A common theme is the large technical complexity which suits our role as lead engineer or system engineer perfectly. Additionally, we have experience with documentation and manufacturing aspects of big-science projects and complex industrial machines.

To summarize: if you need mere manpower, we may not be your best choice. However, if you need brainpower, give us a call!

A SELECTION OF OUR CUSTOMERS:

SRON – TNO (ESO) – Trioptics GmbH – Demcon – VDL (ESO) – Mecon – VSL – Eindhoven University of Technology – Abbott – High Tech Institute and several semicon equipment companies.



Dr. ir. Roger Hamelinck

Dr. ir. Chris Werner

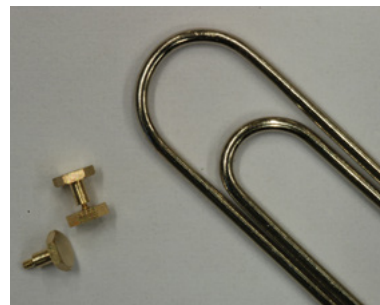
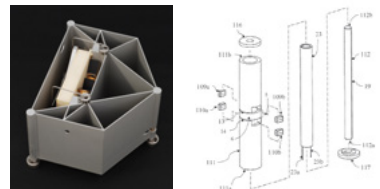
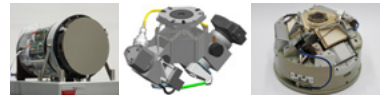
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JPE is a leading center of expertise in precision engineering. We develop electro-mechanical systems for challenging high precision applications in high-tech machinery and scientific instrumentation.

COMPANY PROFILE

Within our company we distinguish two main activities: High Tech Engineering and Cryo & Nano Products.

Within our High Tech Engineering (HTE) department, we develop and realize innovative solutions for your precision application.

Our developments find their way in high tech systems for large OEM's and scientific instruments for science research.

Within our Cryo & Nano Products (CNP) department, we develop cutting edge positioning products with nanometric accuracy for vacuum and cryogenic environment.

The company was founded by Huub Janssen in 1991 and nowadays with more than 25 engineers we serve customers all over the world.

COMPETENCES

- precision engineering
- mechatronics
- nanometer positioning
- positioning in vacuum and cryogenic environment

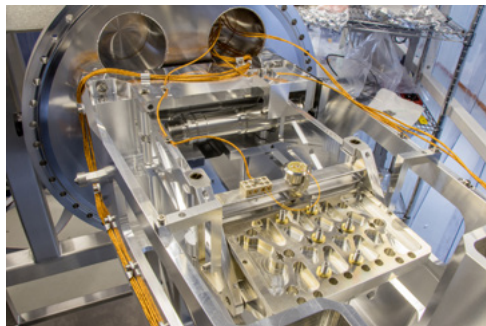


Driven by innovation

Huub Janssen

Founder & CEO

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COMPANY PROFILE

At Lencon we design, develop and produce products for both start-ups and multinationals. At Lencon we believe in creating technological progress. This way our customers not only stay one step ahead of the competition, but they also develop meaningful products.

We accelerate the process of technological progress and product development. With our own integrated design process, we know how to give focus and direction, so that we achieve pioneering solutions and meaningful products. We are a team of experienced multidisciplinary designers and engineers with a broad experience in various branches.

CORE COMPETENCE

- Product development,
- Engineering for smart cost reductions,
- Reliability optimization,
- Precision and mechanical engineering.

MARKETS

- Laboratory,
- Medical & care,
- Semiconductor industry,
- Defence,
- Space research.

REFERENCES

Amongst others: Hittech Multin, Ultimaker, Airborne, Lely, Thyssenkrupp, TNO.



Johannes Backer

Business Developer

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MECAL HIGH-TECH / SYSTEMS

MECAL develops and builds process improving and enabling solutions and products for manufacturers of precision machines and factory owners in the semiconductor industry. One of our technologies, HummingbirdTM active vibration isolation, is applied in research applications, microsurgical microscopes, electron microscopes and semiconductor production equipment.

ACTIVE VIBRATION ISOLATION

Active Vibration Isolation HummingbirdTM provides extremely low transmission of disturbances at low frequencies. It consists of sensors, a motion controller and actuators and operates as shown in the adjacent schematic.

HummingbirdTM starts isolating at a vibration frequency of 0,5 Hz reaching a factor of 10 suppression at 1 Hz in both vertical and horizontal direction. This world class performance at low frequencies is realized by the application of a unique and patented flexure mechanism. These vibration sensitive applications demand our low-noise sensor technology, enabling vibration levels as low as one tenth of VC-G. HummingbirdTM does not require a stiff floor as used for vibration isolation based on piezoelectric technology.

SUPPORT FRAMES

MECAL support frames based on active vibration isolation technology are used for vibration isolation

of scanning electron microscopes and other high precision machines. These support frames provide both high vibration isolation at low frequencies and stiffness that is required for precision machines with heavy stages and automatic loading units. MECAL support frames are cleanroom compatible and equipped with shielding to eliminate even the smallest magnetic field variation.

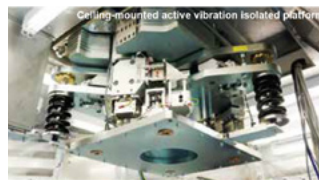
CEILING MOUNTED PLATFORMS

The ceiling-mounted active vibration isolated platform serves as a filter between the ceiling and the microscope and isolates your technology that is connected to the ceiling from all building vibrations, even at the lowest frequencies. MECAL's ceiling-mounted active vibration isolated platform provides microscope users with a stable and clear microscope image in any building and environment.

When you are interested and want to know more about our vibration isolation technologies please contact us via info@mecal.eu



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MI-PARTNERS

PARTNERS IN MECHATRONIC INNOVATION

MI-Partners is active in research and development of high-end mechatronic products and systems for science and industry. We offer our expertise in helping our customers in mechatronics related innovations or technological challenges especially in the field of system design, (thermo)dynamics and control.

We are specialized in concept generation and validation for ultra-fast, extremely accurate or complex positioning systems like stages, manipulators, robots and handlers. By early involvement in pre-development we can provide the complete trajectory up to design, realization and testing with a first time right result. We have a staff of 40 highly educated engineers with considerable experience. As we are working for customers in a wide variety of markets, we can benefit from our experience in all these different areas, and as such help our customers with fresh, innovative and cost effective solutions.

- Precision engineering
- Position metrology
- Dynamics and control
- Thermal dynamics
- Predictive modeling (dynamic/thermal/electromagnetic)
- Dynamic error budgeting
- Vibration isolation
- Air bearing design
- Actuator design
- Design for cryogenics/vacuum/contamination
- Magnetically levitated systems
- Optomechatronics
- Equipment control software



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NLR - ROYAL NETHERLANDS AEROSPACE CENTRE

R&D FOR SPACE

Royal NLR is a leading international research centre for sustainable, safe, efficient and effective aerospace solutions. NLR operates as an unaffiliated centre for applied research and offers innovative solutions and technical expertise, creating a strong competitive position for the industry.

The combination of in-depth insights into customers' needs, multidisciplinary expertise and state-of-the-art research facilities makes rapid innovation possible. Both domestically and abroad, Royal NLR plays a pivotal role between science, the commercial sector and governmental authorities, bridging the gap between fundamental research and practical applications.

NLR's activities span the full spectrum of Research, Development, Testing & Evaluation (RDT & E). Given NLR's specialist knowledge and state-of-the-art facilities, companies turn to NLR for support in the development of their products and services from initial concepts to space qualified products. Royal NLR is one of the largest technological institutes in the Netherlands.

A SELECTION OF NLR'S SPACE SPECIALTIES:

- Big Data Analytics & AI
- On-board payload data processing
- Space electronics
- Collaborative Satellite Technologies

- Micro RF Instruments
- Smart Antennas
- Electromagnetic compatibility
- Thermal management
- Structures & Materials
- (Micro) Launchers
- Testing & Qualification

RESEARCH INFRASTRUCTURE AND FACILITIES

NLR has available a wide range of test facilities with which it can test, verify and validate products. This includes environmental and structural testing, wind tunnel testing and (zero-gravity) flight testing. On the application side NLR has a long heritage in earth observation and satellite navigation. It is primarily focussed on applications in air traffic and defence, but also serves application domains like smart farming, critical infrastructures, and public safety & security.

- EMC Facility
- Vibration and Shock and Test Facility
- Thermal management facilities
- Structures Mechanical and Environmental Testing Facility
- Zero/low-G flight testing



May Kerstens

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SETTELS SAVENIJE

Settels Savenije is a company of over 140 professionals serving an international customer base in various high-tech markets. For these customers we invent, design, manufacture, assemble and test high-tech equipment, products and tools. The team is located at our unique and inspiring location at Strijp-T in Eindhoven.

DEVELOPMENT & ENGINEERING

Our research, development and engineering activities are covered by 5 expertise groups. Our expertise ranges from physics, mechanics, mechatronics, sensors to software and control. The unique combinations of skills and capabilities allows us to provide practical solutions for complex technical challenges which our customers are facing. Our ability to build proto's, FuMo's and proof-of concept models inhouse supports the short time to market of innovations of our customers and Design for Manufacturing of the products we design for them .

SYSTEM ASSEMBLY AND SUPPLY CHAIN

Our development and engineering activities are closely integrated with manufacturing, testing and assembly. We use a supply chain of various qualified strategic suppliers. Our assembly area includes a 600 m² ISO-6 cleanroom. Settels Savenije offers

unique solutions for the design, realisation and qualification of parts and modules according to the highest cleanliness standards in the industry supported by inhouse Residual Gas Analysis (RGA) capabilities for products up to 2 x 2 meters.

PRECISION PARTS

Settels Savenije Precision Parts manufactures complex high accuracy metal parts & modules for application in many crucial functions in high tech equipment in a brand-new factory. Production concentrates on high precision machining of parts and modules which in most cases are applied in critical functions of our customers' high tech products. Our fully automated machinery guarantees a process controlled and cost-efficient production.



John Settels

Director

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WHERE PHYSICS, MECHATRONICS & CLEANLINESS MEET

SIoux TECHNOLOGIES

WE BRING HIGH-TECH TO LIFE

Sioux Technologies has all the expertise in house to develop and assemble complex high-tech systems, often on the edge of what is technologically possible. Sioux's strengths lie in the unique combination of advanced competences in software, mechatronics, mathware, electronics, optics and assembly.

COMPANY PROFILE

This brings a multi-disciplinary approach in system engineering that still fits within the business case. With over 700 development engineers, Sioux supports or forms the R&D department of leading high-tech companies and ground-breaking start-ups. Sioux is keen to take responsibility: from creating ideas in the conceptual phase up to series production. Sioux adds value to its customers and helps them build innovative solutions that can contribute to a society that is smarter, safer, more sustainable, healthier and more fun.

MARKETS

Semiconductor, Analytical & Laboratory Equipment, Medical & Pharmaceutical, Image & Printing.



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Senior Project Developer

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Revenue 2020: 80M – 750 employees

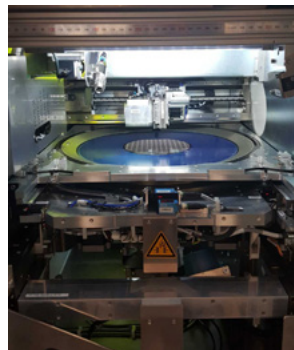
www.siox.eu

COMPETENCES

- **Mechatronics:** System Engineering, Drive & Control, Physics & Optical Design
- **Mechanics:** Production Engineering, FEM Analysis & Simulation, Flow & Thermal Analysis, Structural Dynamics, Accurate positioning.
- **Electronics:** Electro Technical Design & Engineering, High-Speed Digitization, Low Voltage – Low Power Electronics, Mixed Signal & Embedded Electronics.
- **Application Software:** Data Analytics Infrastructure, Cloud, UX, Testing.
- **System Control Software:** System Level Behaviour Modelling, Smart Motion Control Solutions, Medical Regulatory & Functional Safety, Reusable SW Infrastructure, Self-Diagnostics, System Analysis & Simulation, IoT Development, UX.
- **Mathware:** Image Processing & Analysis, Computational Physics, Scientific Computing, Science for Data Analytics, Optimization, AI & ML.
- **Assembly:** DfX, WCM, SCM, NPI, Lean.

REFERENCES

ASML – Kulicka
& Soffa – Philips
– Siemens –
Thermo Fisher
Scientific



TEBULO ENGINEERING BV

Engineering is the main activity of the Tebulo organization. Of the many projects which have been realized by Tebulo Engineering each year, approximately 80% is primarily engineering for the industry where innovation, development, improvement and creativity are key words.

With our engineering activities we serve the Steel-industry, Chemical and Petrochemical, Food, Public utilities, Energy companies, Nuclear-, Pharmaceutical- and the Automotive industry.

The projects relate mostly front-end engineering projects. However, parts thereof, such as studies, risk assessments, basic and detail engineering are important activities.

The projects are multi- or single disciplinary, where mechanical – and electrical engineering play a primary role. Obviously, civil and structural, Energy distribution (medium – and low voltage) Control technology, Measurement and control and Instrumentation as well as Installation technology have a share in our activities.

Beside our own control philosophy, programs are written for different manufacturer control systems and robots.

Within our engineering department Turn-Key projects, where complete mechanization is developed and supplied, are of great importance. Our marking -, strapping – and de-strapping machines, which are supplied worldwide, are also part of our engineering activities.

The project-based approach ensures that projects are completed smoothly, with just 'timed' turn to the right disciplines.

**Tebulo Engineering stands for:
"Technical experts driven by engineering".**



Technische Experts gedreven
door Engineering

www.tebulo.com

John van Stek

Werving & selectie/business development

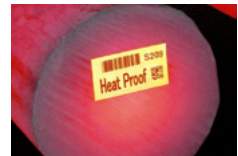
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TECHMASTERS BV

ABOUT TECHMASTERS BV

With many years of experience in the fields of development & engineering of industrial products, test-/ calibration equipment and mechanization/ tooling, TechMasters has been appeared a valueable partner for the industry.

OUR COMPANY

We are pur sang mechanical/ mechatronical developers/ engineers with a broad experience. We can act from idea up to and including delivery but also for assistance/ sub contracting in projects like (re)design, (value)engineering.

CORE COMPETENCES

- Precision technology
- Fine mechanics
- Vacuum & Medical technology
- Robotics & Mechatronics

MARKETS

- Analytical & Medical
- Science & Technology
- Semicon
- Research institutes
- Aerospace

REFERENCES

VSL/NMi – Shell – MAPPER – KROHNE –
ESA/ESTEC – Fokker – TNO



Aad van Loon

CEO/dga

Noordkade 64B

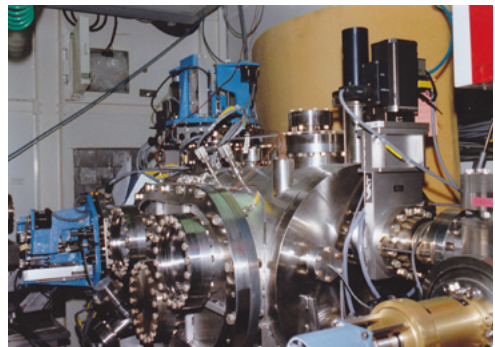
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It is TNO's mission to help the advanced Dutch industry in innovating. One of the focus areas of TNO is Big Science with activities in ground based astronomy, nuclear fusion, CERN/CLIC as well as in space instrumentation and other projects.

PRODUCT INFORMATION

TNO provides system architecture, multi-disciplinary (pre)design, alignment plans and execution, calibration plans and execution, and control of high-end opto-mechanical instruments and mechanisms. Realization and delivery of these systems is preferable done with industrial partners, certainly for larger instruments and for series production. Thus, TNO hopes to open new markets for these industries.

The instruments that TNO develops are characterized by picometer stability and sub-nanometer positioning accuracy; often operating in extremely hostile environments with long life time; and where necessary with intelligent image interpretation.

TNO's expertise in (adaptive) optics, mechanical engineering, control, image processing and contamination control enables the development of a wide range of complex instruments and mechanisms. Our flexure or magnetic bearing-based mechanisms have low friction and zero hysteresis.

We produce quality optics with low wave-front error from a variety of materials including Aluminium, Fused Silica, Silicon Carbide and Molybdenum. We know how to prevent, monitor and remove contaminants, ensuring long life times. And our abilities to process and interpret images are worldwide unrivalled.

REFERENCES

For nuclear fusion, TNO developed endoscopes (CXRS, Lidar), a control system for the plasma, contamination control tools and image processing for in-situ repair. For ground based astronomy, TNO has been playing important roles in the ESO programmes VLT and E-ELT on delay lines, mirror actuation and laser launchers. TNO has developed tools for extreme precise measurements and control on aspherical optical parts and for rapidly finding particles on wafers. TNO's experience in space is applied in HIFI for Herschel, metrology for Gaia, OMI and soon also TROP-OMI and delay lines for Darwin. Important commercial customers of TNO in the field of high-end optomechanics are ASML and Carl Zeiss.

TNO innovation
for life

Bart Snijders

Business Development

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Turnover: 494,6 M€ | 4,400 employees

www.tno.nl



VIRO is an open and progressive engineering firm: we help our clients to successfully combine technology, ambition, innovation, and performance. We specialise in product engineering, mechanical engineering and industrial projects. Our focus in these areas is on engineering and project management.

SPECIFIC EXPERTISE

Using a powerful combination of expertise and experience, we help our clients to push back boundaries and improve performance. From our offices in the Netherlands, Belgium and Germany our 750 employees work for clients worldwide in various market segments.

OUR CORE BUSINESS

- Product engineering
- Mechanical engineering
- Industrial projects

SPECIFIC EXPERTISE

- Systems engineering
- Robotics, mechatronics & vision
- Industrial intelligence
- Cable routing

OUR MARKETS

- Mechanical engineering | Semiconductor industry | Automotive
- Processing industry | Energy | Industrial and non-residential construction
- Food | Offshore industry | Amusement attractions | Aerospace | Defense

REFERENCES

Multiple leading companies in the semicon



Martin Dibbets

Director Netherlands/Belgium

VIRO Head office:

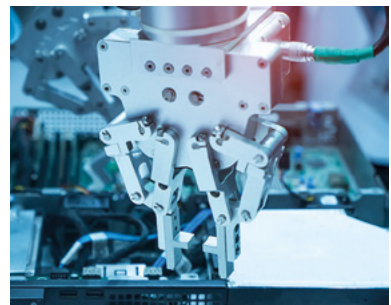
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Zwolle, Geel (B), Aalen (D), München (D) Osnabrück (D)

www.viro-group.com





11

**SAFETY SYSTEMS, LICENSING
AND PROTECTION OF HAZARDOUS
INSTALLATIONS, ACCESS CONTROL,
FIRE AND GAS DETECTION**

SAFETY SYSTEMS, LICENSING AND PROTECTION OF HAZARDOUS INSTALLATIONS, ACCESS CONTROL, FIRE AND GAS DETECTION	Company size	Speciality (USP)			Area							Service	Test & Measurement	Production / Assembly	Engineering	Development	R&D	System Supplier	Technical Consultancy	Systems Engineering	Project Management																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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New Cosmos -BIE	M	gas detector systems; safety; alarming	09; 10	gas detection; dedicated sensors; site service													x	x																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

NEW COSMOS – BIE

New Cosmos – BIE is a supplier of stationary and portable gas detection equipment, mixing high qualified gas detectors with smart forms of communications suitable for applications in gas and oil as well as any other type of industry.

Started in Europe over 25 years ago with a range of detectors for the Semiconductor Industry, New Cosmos – BIE is effectively since early 2011 a part of the global New Cosmos organization.

Together with our 60 years old parent company, New Cosmos based in Japan, New Cosmos – BIE serves beside Europe also customers in the Middle East and North Africa.

Our mission is to create a safer global environment with a reduced number of accidents.

Whilst continuing the developments of products and combining the excellent technology from both sides we aim to create a safer world with a reduced number of accidents in the industry and living environment.

OUR STRENGTHS:

- Sensor technology in house
- Over 50 years of experience
- Reliability
- Unique Selectivity
- Long life time
- Extended range of sensors for different gasses



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PRODUCT RANGE:

- Fixed gas detectors (diffusion/suction)
- Portable gas detectors
- Alarm systems
- Software supervision systems
- Grease /oil dust meter
- Odor level indicators
- Residential detectors

SOLUTIONS FOR THE FOLLOWING MARKETS:

- New Energy Markets
- Gas & Oil Exploration
- Chemical & Petrochemical
- Automotive Industry
- Laboratories
- Micro Electronics
- PV Industry

SERVICES:

Maintenance

- Upkeep
- Repair
- Training
- Survey



REFERENCES

Within the Netherlands: University Twente – University Delft – TNO – University Eindhoven – Smitovens – NXP – Shell – Philips – Fanuc – Yaskawa – Dow – DSM – Glaesum – ECN. Outside the Netherlands: ST Crolles – X-fab – Analog Devices – Helmholtz – Fraunhofer – University Sheffield – University Swansea – Toyota – Kawasaki – Zarlink – University Lund – Airliquide – Praxair – L-foundry – University Madrid



12 **OTHER MAGNETS**

OTHER MAGNETS	Company size	Speciality (USP)			Area							Service	Systems Engineering Project Management	Technical Consultancy	System Supplier R&D	Development	Engineering	Production / Assembly	Test & Measurement		
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal																Software
						Large	Small	Mechat.	Cryo	Vacuum	Electronics HW										
Goudsmit Magnetics Supplies		magnets and magnetic systems	02250105	permanent magnets									x	x	x		x	x	x		
Wijdeven Inductive Solutions	M	high end magnets for motion and power	0225	development; coilwinding; permanent magnets												x	x				

GOUDSMIT MAGNETIC SUPPLIES

GOUDSMIT MAGNETIC SUPPLIES – DUTCH QUALITY MAGNETIC COMPONENTS

Goudsmit Magnetic Supplies forms part of the globally operating Goudsmit Magnetics Group, a family business incorporated in 1959 with branches in the Netherlands, France, Germany, the UK, and the Czech Republic. The company is specialized in delivering high quality permanent magnets and magnet systems to the automotive, aerospace, electronics and medical industries.

CERTIFICATIONS

Goudsmit Magnetic Supplies is one of the few European magnet suppliers that is both ISO 9001:2008 and ISO/TS 16949:2009 certified. As such, we are capable of conducting internal process audits in accordance with VDA6.3. This enables us to operate in many market segments, including the automotive, oil & gas, space, medical and even green technology industries. We utilize a globally operating distribution network and offer the support of our skilled R&D and QA engineers, who have the most advanced measuring equipment available.

MAGNETIC MEASUREMENTS & CALCULATIONS

Our most recent test equipment acquisition is an optical 3D scanner which enables us to provide three-dimensional measurement data and analyses for industrial and automotive parts. Rather than just measuring individual points, the complete geometry and basic shape of an object are precisely

established in a dense point cloud or polygon mesh. In addition we also are able to perform magnetic calculations in 3D.

SUPPLY CHAIN INTEGRATION

Goudsmit Magnetics role in supply chain integration is to serve as a sounding board for our customers and to be part of the engineering, development and testing process for the component or assembly by utilizing our extensive experience not only in application engineering but also in the sourcing of high quality products. The key to successfully addressing trends such as falling cost prices, increased flexibility and global sourcing is long-term, reliable, predictable relationships between OEMs and the tier1, tier2 and tier3 suppliers. Establishing strong relationships requires excellent collaboration and communication throughout the chain and mapping out the improvement potential of the whole chain so it can compete, or continue to compete, at an international level.

IN A NUTSHELL

Being able to source high quality products, manage logistics, be a sparring partner in design and development, validate component requirements with state-of-the-art equipment and contribute to an optimized supply-chain makes Goudsmit a valuable and serious partner for the high-tech industry.

GOUDSMIT
MAGNETICS GROUP

Marc Teeuwen
Sales Manager

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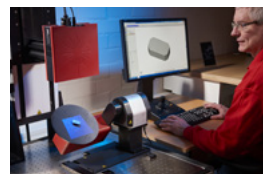
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VDA | Verband der
Automobilindustrie



WIJDEVEN INDUCTIVE SOLUTIONS

KUK WIJDEVEN

As a subsidiary of KUK Electronic AG, Wijdeven develops and produces custom specific transformers, coils and electromagnetic components for the high-tech industry for decades.

We offer short communication lines, a short time-to-market of prototypes and a broad experience of our employees in the field of winding techniques. Thanks to our fully automated production units, we are also able to supply large serial volumes (+ 1Mpcs) worldwide.

Our specialisms are the winding of orthocyclic coils with a high copper fill factor and **high-frequency transformers and coils**. To complete the inductive portfolio we supply **low-frequency transformers** up to 3 MVA as well as **medical safety transformer cabinets**.

PRODUCTION KUK WIJDEVEN

KUK Wijdeven produces coils and transformers worldwide. More than 40 highly motivated employees are divided into two ISO 9001 certified sites;

- In Ter Apel is the production facility, operations and finance department
- In Oirschot is the R&D department, sales department and the 'proto shop'.

If the customer needs prototypes KUK-Wijdeven will be able to produce them with rapid prototyping. KUK Wijdeven adheres to the same process procedures, quality specifications and management guidelines that apply at Swiss headquarter.

KUK GROUP

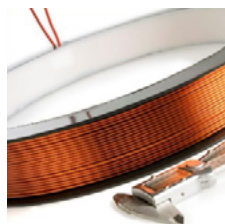
Every year, the KUK Group winds more than 200 million coils, assembles more than 1 million printed circuit boards and produces around 250.000 modules for customers all over the world.



René van den Heuvel

Sales Director

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13
**INFORMATION- AND
COMMUNICATION TECHNOLOGIES
AND CODAC (CONTROL,
DATA ACCESS AND COMMUNICATION)**

INFORMATION- AND COMMUNI- CATION TECHNOLOGIES AND CODAC (CONTROL, DATA ACCESS AND COMMUNI- CATION)	Company size	Speciality (USP)			Area							Service								
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal															
						Large	Small	Mechat.	Cryo	Vacuum	Electronics HW									Software
4DSP BV		information technology	049001; 040509; 0304	analogue and digital electric						FPGA; DSP; data acq	embedded									
Advanced Solu- tions NL	V	information technology	0405; 040509; 0350	electronics design; simulation			x			DSP; signal analysis	embedded			x			x	x	x	
Stream HPC BV	S	software for GPGPU computing; R&D	0401; 0405; 040502	code optimisation; low level programming							OpenCL/ MP; CUDA			x		x	x	x		
Tessella	M	science powered software technology	04	consulting; IT architecture; design and build							x			x				x	x	

4DSP

LEADER IN DATA ACQUISITION AND SIGNAL PROCESSING SOLUTIONS

4DSP is an innovative company specialized in the design and production of FPGA products, high speed digitizers and turnkey systems for the most demanding applications. Located in the Netherlands, 4DSP is ideally suited to partnering with European companies in order to deliver solutions for the most challenging applications.

PRODUCTS

- **FPGA COTS Boards:** Based on Xilinx Virtex and Kintex family FPGAs; in PCIe, VPX, XMC and FMX form factors
- **FMC Modules:** I/O and coprocessor boards: Analog inputs and output with up to 5.6 GHz sampling rate and up to 16 channels, radio transceivers, optical transceivers, clock sources and Digital Signal Processors (DSPs).
- **FPGA IP:** FFTs, digital filters, DDC, Serial FPDP and PCIe with DMA.
- **Systems:** Complete systems that can be either used as turnkey solutions or development platforms.
- Custom Solutions, Support and Consultancy

APPLICATIONS

4DSP delivers high-performance DSP solutions for the specific requirements of Military, Aerospace, Biomedical, Chemical Science, Telecommunication and Research applications such as Image Processing, Software Defined Radio (SDR), RADAR, SONAR, Airborne Surveillance, Medical Imaging and Fiber Optics Sensing.

REFERENCES

4DSP serves hundreds of customers across multiple industries including NASA – Boeing – BAE Systems – Lockheed Martin – Pratt & Whitney – Anite Telecom – Philips – CERN – RUAG Space, NLR, SRON – PSI – Siemens – Bosch – Fraunhofer and many more.



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ADVANCED SOLUTIONS NEDERLAND

Advanced Solutions Nederland is a hi-tech design consultancy that specialises in providing custom made DSP (digital signal processing) algorithms and hardware design services for a broad portfolio of sensor measurement applications.

PRODUCT INFORMATION

Our core competence is the development and implementation of advanced signal analysis algorithms for high performance sensor applications. Typical applications include: noise reduction in speech/audio data, automotive radar tracking algorithms (speed cameras, collision avoidance systems), feature extraction, and non-linear system identification.

Whether you require feasibility advice, critical thinking, or a fully integrated product solution, we offer a comprehensive range of managed services at any stage of your product design. Building upon our track record of providing international businesses with working prototypes, we integrate the best technologies and talents in order to convert your concept into reality.

SUMMARY OF CORE COMPETENCIES

- Real-time DSP algorithms.
- Non-linear signal analysis.
- Simulations.
- Embedded software.
- Low noise, ultra-precise instrumentation and measurement systems.
- Prototypes.
- Proof-of-concept demo systems.

SELECTED REFERENCES

Mitsubishi Electric (UK) – Shell (NL) – Etronic (DK) – Hi-tech RF & Microwave solutions (NL) – Gatsometer (NL) – Gnoka (NL) – NeuroRobotics (UK).



Dr. Sanjeev Sarpal

Director

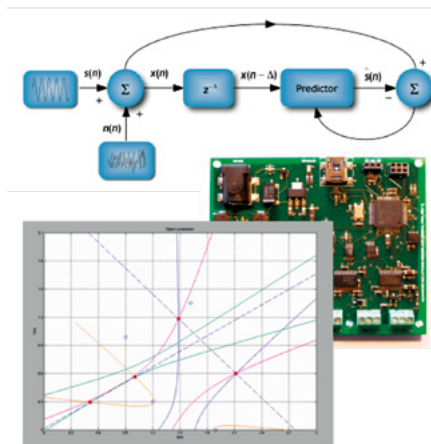
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STREAM HPC BV

HIGH PERFORMANCE SCIENTIFIC SOFTWARE DEVELOPMENT

**Both building Scientific Software and HPC Software are an art of engineering.
We combine both.**

Stream HPC is an international software development company based in the Amsterdam that specializes in building fast software using the power of GPUs and clusters. Our team consists of developers who have years of experience in building complex models into fast software. We have a long track-record of 10 years and many recurring customers.

EXAMPLES OF OUR EXPERIENCE:

- Large collision experiments
- Real-time Big Data processing
- Specialised linear algebra libraries
- Quantum chemistry/physics simulations
- Image and video processing

OFFERED SERVICES:

- OpenCL, CUDA, OpenMP and MPI programming
- Generic super-computer programming
- Improving existing code
- Low-level programming
- Documenting black boxed software

STREAM
High Performance Computing

Vincent Hindriksen

Managing Director

Naritaweg 12B

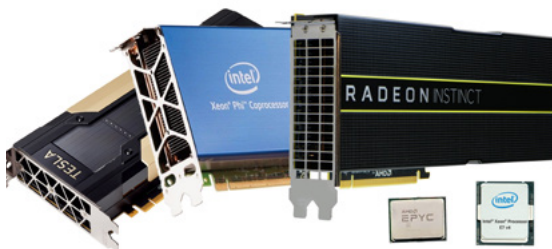
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Tessella is the international provider of science powered software technology and consulting services. World leading organizations choose our unique blend of science, software engineering and sector expertise to deliver innovative and cost-effective solutions to complex real-world commercial and technical challenges. Our people are high achievers from leading universities and are passionate about delivering value to clients; more than 50% hold PhD qualifications.

We are proud that our work makes the world a better place to live in: developing smarter drug trials; preserving the digital heritage of nations across the globe; minimizing risk in oil and gas exploration; controlling the orbit and attitude of satellites; researching fusion energy.

SERVICES

IT Consulting Tessella IT consulting services advise businesses on how best to use information technology to meet their business objectives. We provide a broad range of IT consulting skills that include: business analysis, IT strategy, supplier selection and IT architecture.

Technical Consulting With over 100 PhDs in the company, and a broad experience in academic and industrial research across a wide range of sectors, Tessella constitutes a world class problem solving engine able to bring novel ideas and innovation to your business.



Dr. Eric Arends

Operations Manager

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Turnover: €23M | 240 employees

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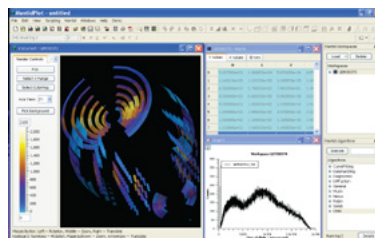
Science Powered Software Development & Systems Integration has been at the heart of what we do for over 25 years. In that time we have designed, built and deployed thousands of successful software systems and IT projects, for hundreds of clients.

REFERENCES

Tessella customers include: JET fusion research laboratory – ITER – TNO – Deltares – European Space Agency – Dutch Space – Rutherford Appleton Laboratory – Diamond Light Source – AkzoNobel – Unilever – Shell – Koninklijke Bibliotheek

"Tessella's background in science and their professional approach to system design and development means we have been able to significantly increase our overall capacity, efficiency and quality." - Aart Wismeijer, Senior Researcher, High Throughput Experimentation. AkzoNobel

"...Tessella really understands R&D users and processes. This translates into responsive levels of support, and a real appreciation for how each application can be enhanced going forward." - Pete Keeley, Innov8 Programme Manager, Unilever





14 **PHOTONIC TECHNOLOGIES**

PHOTONIC TECHNOLOGIES	Company size	Speciality (USP)			Area							Service	Systems Engineering Project Management	Technical Consultancy	System Supplier R&D	Development	Engineering	Production / Assembly	Test & Measurement	
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal															
					Large	Small	Mechat.	Cryo	Vacuum	Electronics HW	Software									
Diamond Kimberlit BV	M	Optical fiber Technology	08040403; 080201	fiber-optics interconnecting parts	x	x	x	Feedthrough								x	x	x	x	
LioniX International		photonics; MEMS; microfluidics and technology	030105; 0803	customized microsystem solutions in scalable volumes						PIC; MEMS; opto-fluidics	embedded	x		x	x	x	x	x		
Sumipro	S	high precision optic systems and components	0801	design and consultancy; precision machining; coating										x		x	x	x		

DIAMOND KIMBERLIT BV

THE COMPANY

DIAMOND is a worldwide leader in supplying high precision fiber optic solutions and has been serving successfully several markets for over 30 years. Also, **Diamond** is known as a dynamic and innovative company, able to develop reliable, customized components and equipment, in response to the increasingly demanding customer requirements.

TECHNOLOGIES

Diamond provides a wide range of products based on sophisticated technology and its strong know-how acquired over many years. Manufacturing special fiber-optic interconnecting parts is our core business, a specialization that allows us to meet the most different kinds of customer's needs.

MANUFACTURING DEPTH

Diamond has a well-established competence in processing high-quality ceramic, metal and plastic components, right from the raw material to the finished product. This system allows the various manufacturing processes to be controlled and enables us to guarantee that each single component meets all the quality, reliability and performance standards which stand for Diamond products throughout the world.



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MECHANICAL COMPETENCES

Integrated Ceramic production (pressing, sintering, machining); Precision metal machining in non-standard metals (Ti, WC, Kovar, stainless, ...); High precision plastic injection; Ultra-high precision lapping; Ultra-high precision drilling; Fiber-ferrule polishing.

OPTICAL COMPETENCES

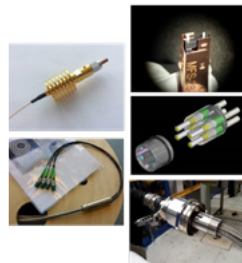
Fiber active core alignment; Active Polarization Orientation; Contact optical interfaces; Non-Contact optical interfaces; High power optical applications; 3D linear (X,Y,Z) active fiber positioning; Multi-Channel concepts.

ASSEMBLY COMPETENCES

Singlemode Fiber; Multimode Fiber; Standard PM Fiber; Enhanced PM Fiber; Reduced Clad Fiber; Double Clad Fiber; Large core Fiber; Small core Fiber; Multicore Fiber; Photonic Crystal Fiber.

REFERENCES

Nikhef – CERN – TNO – ESA – NASA – ECN
– Mapper – Philips – ASML – Thales – Dutch
Defense – NATO –
Fugro – Fokker Elmo
– TU Eindhoven – TU
Delft – UTwente –
Leiden University – VU
Amsterdam and many
more.



LIONIX INTERNATIONAL

OUR CHIPS DRIVE YOUR BUSINESS

LioniX International is a leading global provider of customized microsystem solutions in scalable production volumes. We provide customized solutions for OEM's and System Integrators, from design to fully assembled modules, by vertical integration and in scalable production volumes. We maintain our technology leadership secured by a strong IP position.

LioniX International core competences are in Photonic Integrated Circuits (PIC), customized MEMS, and opto-fluidics.

PHOTONICS

MEMS, Microfluidics & Technology Services



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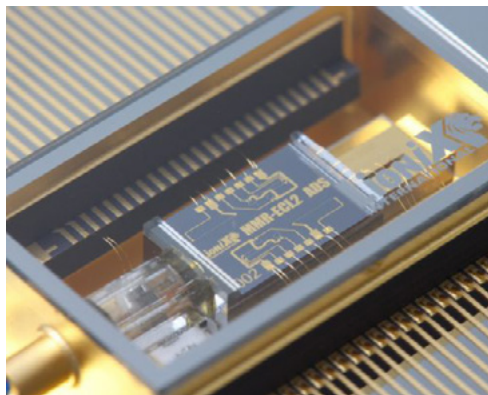
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Contact details

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F: +31 (0) 53 20 11 303

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For more than 25 years Sumipro supplies high precision optics for customers all over the world. We help and support companies with design and manufacturability, produce prototyping parts and small series optics. Our customers have a background in all kind of industries as medical, aerospace, defence, space, VR/AR, injection moulding and optical metrology.

EXPERTISE

We realize custom made optics by means of diamond turning and fly-cutting. Optics for night vision systems, mirrors for imaging and communication systems, light sources, polymer lenses and inserts for injection moulding, etc. Materials that can be used range from aluminium to nickel and other non-ferro metals as well as lenses from optical quality polymers. We offer an in-house coating facility, creating a one-stop shopping concept for your optical design.

Product information: Development and manufacturing of optical components with competitive pricing, fast delivery lead times and a high accuracy: surface form errors below ISO 3/1(1), depending on geometry, material and size and surface roughness values $Ra < 10\text{ nm}$. We specialize in aspherical, off axis, non-rotational symmetric, diffractive/Fresnel and plano surfaces. Our main product lines are:

Mirror Optics	Polymer optics	IR optics	Inserts	Consultancy
Max. diameter 300 mm, made from various aluminium alloys (also RSA), copper or other non-ferro materials.	Fast prototyping in various optical polymers (PMMA, PC, Zeonex, OKP, Topaz, Apel). Lenses including complex milled mounting flanges are also possible.	Lenses realized in germanium, silicon and high purity float zone silicon (HPFZ) up till diameters of 240 mm.	Diamond turned inserts in Nickel, Aluminium, brass or RSA for injection moulding or we can be your partner for the delivery of small to medium volume series.	Innovative solutions in design, engineering and rapid prototyping. Our engineers can help you to create better optics and systems.



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For most of the optics we can supply them with a reflective or an AR coating. Standard coatings are among others: reflective for mirrors e.g. gold, silver, aluminium protective and enhanced coatings; AR for VIS and IR, average reflectivity $<0.5\%$ or by custom design. Besides AR we can supply front sides with DLC (IR).

Please contact us with your custom design or optical challenge.





15
MATERIALS HANDLING:
DELICATE AND/OR HEAVY GOODS,
LIQUIDS AND GASES

MATERIALS HANDLING: DELICATE AND/OR HEAVY GOODS, LIQUIDS AND GASES	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	Supply	System Supplier	R&D	Development	Engineering	Production / Assembly	Test & Measurement	
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal																		
						Large	Small	Mechat.	Cryo	Vacuum	Electronics HW												Software
Ecomatters		chemical safety; sustainability	1090	consultancy; service; training											x								
Harsveld Apparatenbouw BV	S	process equipment supplier	0901; 02; 060204; 1302	pipng; vessels; construction	x	x										x			x	x			
Hydro-Carbon Separation Systems BV		separation; filtering of hydro-carbons	0902; 09031003; 1003	customised separation; filtering systems											x				x	x			
HQ Pack	S	packaging; handling and transport	11; 1102; 1104	integrated handling and transport solutions	x	x	x	x	x					x	x				x	x	x		
IPS Technology	S	packaging; handling and transport	11;1102;1104	integrated handling and transport solutions	x	x	x	x	x					x	x				x	x	x		
Lamers High Tech Systems	M	processing high purity gasses and liquids	0602; 09; 1006; 1309	engineering; production; on site installation; turnkey				x		x				x	x	x	x		x	x	x		
Montair Proces Technology BV	M	nuclear proces technology; pollution	09; 10	turnkey systems supply; projects										x		x			x	x	x		
PTB Special Equipment		customized materials handling equipment	1103; 1104; 1110	engineering; manufacturing												x			x	x			
Smink Group BV	S	installations and systems for high purity	09; 10	engineering; manufacturing; orbital welding											x	x			x	x	x		

ECOMATTERS

Ecomatters provides services, tools and training in the field of sustainability and chemical safety and links these topics where possible. Among our multinational clients are chemical and pharmaceutical companies, manufacturers of cosmetics and cleaning products, companies that provide water and environmental services and retailers. Within each project we are committed to achieve tangible results that are comprehensible and useful within the organization. We focus on customer satisfaction in order to build sustainable business relationships.

SUSTAINABILITY

We offer sustainability strategy consultancy services as well as sustainability assessments based on Life Cycle Thinking, such as environmental footprinting, Life Cycle Assessment (LCA) and Life Cycle Inventory (LCI) data management. We assist organizations in determining their stance on sustainability and setting concrete sustainability goals. Further, we perform quantitative analyses in the area of social, financial and environmental issues and identify any issues within these sustainability aspects for our clients.

Based on Eco Efficiency Analysis (EEA), Ecomatters has developed the Customer Value Calculator (CVC). The CVC is a user-friendly, interactive model, which quantifies the business case of your

sustainable product throughout the value chain. Fully customized to customer-specific products and/or scenarios, the CVC provides an integrated overview of financial and environmental impacts of your product.

CHEMICAL SAFETY

In the field of legislation and regulations, Ecomatters provides advice and guidance on chemical safety, substance management, REACH, EU-GHS/CLP, and product registrations. Depending on our customer's needs we take the full project off their hands or part thereof, such as performing (eco) toxicological risk assessments, authoring MSDSs, creating exposure scenarios or calculating hazard classifications.



ecomatters

Max Sonnen

Partner

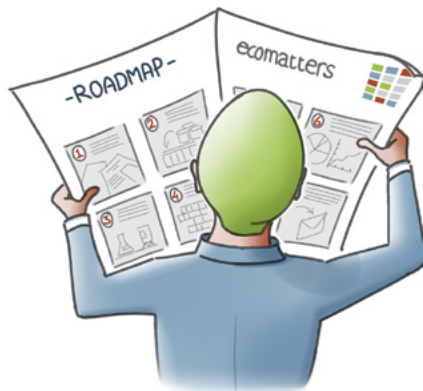
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HARVELD APPARATENBOUW BV

ENGINEERING, MANUFACTURE AND INSTALLATION OF

- Piping
- Plate- and construction work
- Pressure vessels & tanks
- Heat exchangers
- Skidbuilding

MATERIALS

- All Steel and Hi alloy Steels
- All Stainless Steels and heat-resistant Steels
- Duplex and Super Duplex
- Aluminium
- Titanium, Hasteloy®, Incoloy®, Inconel®, Monel®, Haynes®

CERTIFIED

- ISO 9001
- ISO 3834-2
- PED Module H and H1.
- Workshop Approval Germanischer Lloyd

“We have built the Smelt Reduction Vessel for the Hlsarna pilot plant”

REFERENCES

Albemarle – Danieli-Corus – EXXON mobil –
Gardner Denver Nash – Linde Gas – Tata steel – e.a.



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HYDRO-CARBON SEPARATION SYSTEMS BV

Hydro-Carbon Separation Systems BV is an engineering and sales organization focussing on filtration and separation solutions in the range of hydrocarbon based products, applications and markets all over the world.

We specialize in the filtration and separation of process streams, such as fuels, (natural) gas, oils, base chemicals and water.

We provide engineering, design and supply of customized filtration and separation solutions, based upon years of relevant experience.

We offer a range of products including – but is not limited to – cartridge filters, coalescers, filter/water separators, cyclones, settlers, monitors, degassers (OILML-R117-1 approved), and separators for hydrocarbon liquids and gasses.

New pressure vessels can be designed according to customer's requirements, specifications and international pressure vessel codes including ASME U-stamp and NoBo inspections.

Existing vessels can be retrofitted with high quality filter-, coalescer- or monitor replacement cartridges for improved performance or better economics.

With this specific knowledge we are in the position to offer custom made:

- Filters to remove solids from refined hydrocarbons as diesel, naphtha, gasoil, kerosene, gasoline, transformer oils etc.
- Filter/water separators for removal of water from hydrocarbon liquids and gasses
- Oil separators to remove hydrocarbons (oil) from water.
- Degassers (OIML R117-1) to remove gas from liquids in custody transfer metering systems.
- Tankdewatering systems.
- Unloading systems

We served already several international known companies like BP, Shell, Siemens, Dow Chemical, IMTECH, KROHNE Oil&Gas, URUK Engineering etc , with our filter and separator vessels and internals. We welcome your technical questions or challenges in the field of filtration and separation.



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HQ PACK

HQ Pack is one of the world's leading companies in the field of high-tech packaging. We design, develop, prototype, produce, clean, manage and distribute packaging for high-quality, precise and/or fragile industrial products.

Our customers are leading, renowned companies active in the following market segments:

- Semiconductor industry
- Big science (ao. E-ELT and CERN)
- Optical and photonics industry
- Aerospace industry
- Machine construction and mechanical components

HQ Pack is a full service distribution partner.

We develop optimal packaging solutions and

distribution processes for high-tech industrial products in close cooperation with the customer.

The results are various handling tools and types of packaging which allow products to be transported over long or short distances without any problems.

The solutions vary from simple cleanroom packaging to high-end, customized packaging composed of different parts and materials.

HQ Pack's head office is located in Eindhoven, the Netherlands. HQ Pack also has a branch in Johor, Malaysia, Bethel (CT) and Fremont (CA), United States of America, which allows us to offer our services worldwide.



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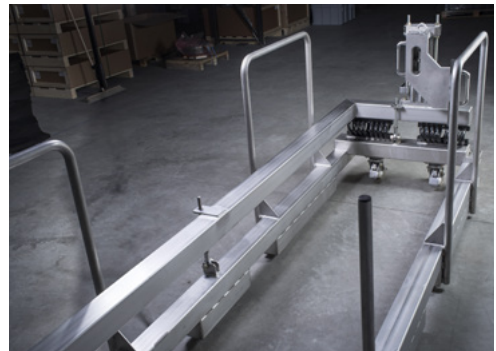
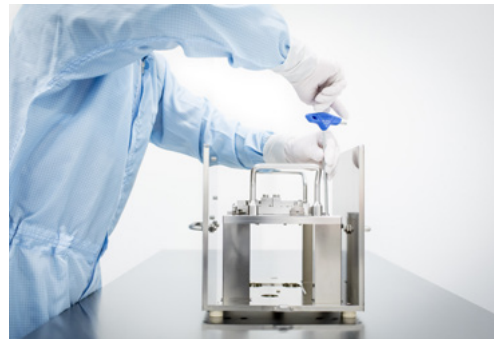
IPS TECHNOLOGY

IPS Technology is a renowned and independent advice and design bureau in High Tech packaging, tooling and testing.



IPS Technology develops a packaging transport method for industrial products that provides optimum protection. We advise on disassembly, shipping and reassembly of products and product components and have invested substantially in highly advanced test facilities. We test packaged and unpackaged products and conduct climate tests, corrosion tests, thermal shock tests, vibration tests and impact tests.

Innovar Cleaning Control, the sister company of IPS Technology, is a specialist company that is capable of providing the entire process of cleaning, qualification, assembly and transport.



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LAMERS HIGH TECH SYSTEMS BV

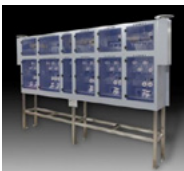
Lamers High Tech Systems is a leading supplier in the semiconductor, PV solar, aerospace, pharmaceutical, and other technology driven markets for over 25 years.



Complex piping set up



IBC Chemical Cabinets



Chemical distribution



DI Water system



Gas bottle and distribution Cabinets



Toxic Piping



Exhaust Piping



Waste water treatment

It is our mission to bring ultra-high purity fluid handling, conditioning, and delivery solutions to our customers that minimize the total cost of ownership while maintaining the highest levels of quality and reliability.

Lamers High Tech Systems BV is headquartered in Nijmegen, The Netherlands and has an additional production site in Kerkrade. Both facilities have

certified orbital stainless steel welding, plastic welding, and assembly in cleanrooms up to class 10 for high purity manufacturing.

In addition, Lamers High Tech Systems provides R&D, design engineering, and the global installation and commissioning services to ensure our customers systems startup in the most efficient and productive manner.

The installation teams have the capabilities to do turnkey installation of complete infrastructures. These services include: Gases, Chemical and Power supply systems, Cooling, Demi Or process water systems, gas exhaust and scrubbing systems, drainage and waste water treatment systems. These installations and piping systems are qualified and validated after installations are tested by our in house team that have dedicated equipment depending on the customer's specifications. The teams have done a number of installations worldwide and "hot" commissioning at the point of use.



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MONTAIR PROCESS TECHNOLOGY BV

Montair Process Technology BV, established in 1971, provides customised turnkey solutions on a worldwide basis. Montair Process Technology BV is an independent member of the Manders Industries Group with affiliated companies established in the Netherlands, Belgium, Romania, India and the USA.

PRODUCT INFORMATION

The core business of Montair Process Technology BV is divided into two categories:

- Air pollution control & thermal treatment systems
- Special process equipment.

TURNKEY PROJECTS

Montair Process Technology BV focuses its activities mainly on realisation of turnkey projects. From the design and engineering phase to the final start-up of the systems, Montair Process Technology BV will carefully manage all aspects of a project. All stages of a project are realised under our own administration in our brand new plant.

The manufacturing department of Montair Process Technology has a well-equipped machinery. This department mainly processes stainless steel, high-nickel alloys, aluminium and thermoplastics. The engineering and manufacturing department is also responsible for the development and assembly of complete control systems including HMI and data logging capabilities.

Montair Process Technology BV is certified according ISO 9001, SCC** and ISO 3834-2 (under construction).



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PTB SPECIAL EQUIPMENT

CUSTOM BUILT MATERIAL HANDLING EQUIPMENT

PTB Special Equipment is a manufacturer of non-standard mobile material handling equipment. Pallet trucks, pallet stackers and industrial tow tractors up to 50 tons lifting capacity.

REFERENCES

The company has built special machines for many well-known business partners, including ASML
– Mercedes Benz – Philips – NedTrain – APM
Terminals – Hitachi and many others.

PTB Special Equipment brings non-existing solutions to reality.

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Director

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transportmiddelen@ptb-group-eu

www.ptbspecial.com /

www.ptbmachinefabriek.nl



SMINK GROUP BV

WeWe (co-) develop, produce, supply and install components, sub-systems and complete installations in the high-purity industry. Smink Group follows strict quality protocols accurately and supplies its products and services in accordance with the relevant standards including GMP and FDA.

This, combined with the company's flexible no-nonsense approach and high sense of quality, results in end products that are guaranteed to meet your specific requirements.

When you are a manufacturer, engineer, engineering agency or contractor and you have to take care of the construction or modification of a high-purity installation, why not challenge Smink?

Just tell us what you want.

Experience our problem-solving capacity, our personal commitment, and our straightforward solution-oriented approach!



Rene Smink

Director

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16
**EDUCATION/TRAINING/
INSTRUCTION**

EDUCATION/ TRAINING/ INSTRUCTION	Company size	Speciality (USP)			Area							Service	Supply	Production / Assembly	Test & Measurement							
																Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal			
		Large	Small	Mechat.	Cyro	Vacuum	Electronics HW	Software														
Mikrocentrum		knowledge and network organization	1214; 129004; 13	technical training-courses; trade fairs-thematic events		x	x	x		x	x	x		x	x	x						
High Tech Institute		courses and training in precision engineering	121402; 121404; 1290	open enrollment or (customized) in house courses	x	x	x	x	x	x	x	x	x	x	x	x						

MIKROCENTRUM

TOGETHER WE CREATE THE TECHNOLOGY OF THE FUTURE

**For over 50 years, Mikrocentrum is supporting industrial companies with
Training - Events – Business**

We organize courses, trade fairs, events and network meetings in the following technical fields:

- Additive manufacturing and prototyping
- Agri and food technology
- Automotive technology
- Electronics and electrical engineering
- Extended Reality
- Mechatronics, robotics and industrial automation
- Optics, photonics and lasers
- Precision technology and mechanical engineering

OUR COLLABORATION PARTNERS

DAA, Arburg, Brainport Industries College, DSPE, Engel, EVMI, flam3d dark, Vereniging ION, Iscar, Lautus, Mitutoyo, Federatie NRK, Spartners, Summa College, VOM, Jakajima, RGB Digitaal, RAI



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HIGH TECH INSTITUTE

Knowledge that works

We help technology-driven people and companies grow from good to great. Our advanced technical and leadership trainings are designed to give participants fresh insights into both their field of expertise and the impact they can have while also

challenging them to take on a transdisciplinary approach. We believe that world-changing developments are realized when teams of professionals appreciate each other, challenge one another, and are willing to lend a helping hand.





17
MISCELLANEOUS

MISCEL- LANEOUS	Company size	Speciality (USP)			Area							Service	Project Management	Systems Engineering	Technical Consultancy	Supply		Development	Engineering	Production / Assembly	Test & Measurement
		Discipline (WHAT)	Procurement codes	Technology-/ skill-/ product centric (HOW)	Metal											Software					
					Large	Small	Mechat.	Cryo	Vacuum	Electronics HW											
ATG Europe		on site technical services	1305; 1307	projects; simulation; analysis; FEM						x		x	x	x	x		x	x	x		
Atkins BV	L	technical services	13	design and analysis; areospace; consulting									x	x	x		x	x	x		
Deerns Nederland BV		purity and contamination control	050305; 13	projects; service; support											x			x	x		
elQuip		technical room furniture	1120105; 120106																		
Inno4life		life science; engineering; packaging	tailor made; automation; system integration	integrated handling and transport solutions										x					x	x	
Omneo Systems		contamination control for supply chain	010208; 10; 1214	development of innovative cleaning concepts											x						
Thomas Thor Associates	S	staff and interim consultants for nuclear	13; 1312	recruitment; executive search									x	x							

ATG EUROPE

ATG is recognized as a leading provider of specialized engineering, scientific and technical services to the Aerospace, High Tech and Offshore industry. With highly educated personnel operating in different branches ATG Europe provides access to the brightest minds. ATG has three main core competencies: Projects, People and Medialab.

ATG PROJECTS

ATG Projects excels at delivering highly demanding engineering projects in the areas of structural, thermal and flow analysis. Our team of in-house engineers is experienced in analyzing and solving complex problems in demanding technical fields and industries. Major customers include the European Space industry, EADS/Airbus, Atlas Copco and Shell. From 2008 onward our focus has broadened to other challenging areas such as Offshore, Energy and High Precision. As an example ATG Projects has worked on structural parts of various Airbus aircraft, it has been responsible for the thermal design of the vegetation instrument on board the Belgian PROBA-V satellite and has given consultancy for the optimization of a supersonic gas separating system for Twister. Next to that it is and has been involved in various R&D projects ranging from investigations in new structural concept using composites to the development of a helicon plasma thruster.

ATG PEOPLE

ATG People is the key player in delivering highly educated personnel for High Tech environments throughout Europe. Our brightest minds are engaged in innovative projects performing to high standards and utilizing the full extent of their professional knowledge. With our 30 years of experience we have access to the brightest minds in for instance structural, electrical, mechanical and automation engineering.

MEDIALAB

ATG Medialab is our high-end 3D visualization studio that has the ability to visualize technical and scientific complex projects is unmatched worldwide. The outstanding reputation among customers is earned by the scientifically and technically sound visuals of complex subjects. Sectors of activities are the Aerospace, Semiconductors, Defense, Offshore and Energy industries.

REFERENCES

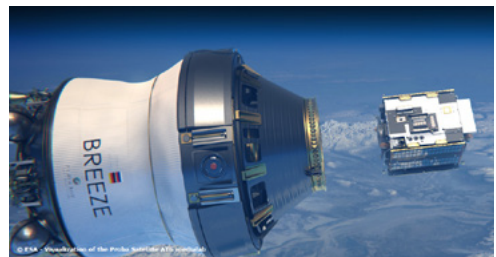
ESA – OHB – Qinetiq – Kongsberg – ASML – TNO
– EADS/Airbus – Lockheed Martin – Atlas Copco



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Atkins BV, part of Atkins Aerospace and Atkins Plc, is a leading multinational aerospace design and analysis consultancy, with over 17000 permanent staff worldwide. Atkins Plc operates in multiple markets, including: Aerospace, Defence, Highways & Transportation, Oil and gas, Nuclear, Telecommunications, Rail, Water and Environment. As a result we have access to a variety of engineering capabilities such as Atkins Nuclear. Qualified to AS9100 : 2004 rev. C across all offices

PRODUCT INFORMATION

We design and analyse main components for many new aircraft programs, as have emerged onto the market over the past ten years such as the Airbus A380, A400 M and A350XWB, Lockheed Martin JSF and Mitsubishi Jet:

- Wing structure including integration of engine, landing-gear and movables
- High-lift devices
- Fuselage structure and interior
- Future aircraft program concept studies
- Structural integrity prediction methods development
- Landing gear systems & structures engineering services
- Engine components for low pressure compressor

For ITER-NL, Atkins performed an optimisation study of the concept for Remote Handling Tooling of the Port Plugs.

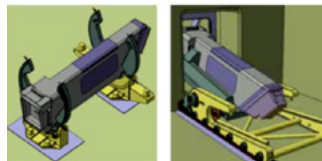
SPECIFIC EXPERTISE INCLUDES

Structural and mechanical engineering for large and complex international projects including integration and design for manufacturing.

- **Structures:** Light weight metallic and composites
- **Systems:** Landing gear, Controls, Fuel systems
- **Interiors:** cabin, cargo-hold, flight-deck
- **Aero Engines:** Compression & transmissions
- Our main tools are CATIA V5, Unigraphics NX, MSC PATRAN/NASTRAN, HyperMesh, PDM.

REFERENCES

Our Customers include Airbus – Rolls-Royce – Fokker – Bombardier



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DEERNS NEDERLAND BV

Deerns delivers solutions for high-tech facilities where contamination control is paramount. Our Clean Tech experts have decades of expertise and experience in developing, designing and putting into operation contamination controlled research and manufacturing facilities.

Our design methodology puts the client's process at the center of the design. This 'future ready' approach is crucial in achieving successful solutions that effectively integrate all aspects of operations, processes and equipment within the facility, the supporting systems and technical infrastructure. Our projects include research and production spaces, both new and renovated, providing improved efficiencies, flexibility, and people-centered spaces that meet international standards.

KEY REFERENCES

ASML – FOM – Nikhef – imec – Danone – DSM
– MESA+ – MSD – SRON – University Eindhoven –
NXP – Bayer – ARCNL – VU Amsterdam

OUR CLEAN TECH SERVICES

- Project Programming
- Project Management
- Design and Engineering
- Construction Supervision
- Qualification & Validation
- Hook-Up
- Operational Support



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ELQUIP

e!Quip has been for over 30 years overall designer of workshops in the field of electrical and electronic engineering and assembly. Advice and guidance form the basis for each project, customized solution or delivery of finished products.

PRODUCT INFORMATION

The range (ESD-safe) workshop furniture consists of a variety of workbenches and workbench configurations, work chairs, filing cabinets and trolleys. Additionally e!Quip offers a wide range of tools, (ESD) accessories and instruments (including oscilloscopes, spectrum analyzers, generators, power supplies and multimeters of the brand BK Precision).



The workshop furniture brand Flexiline® has been developed by e!Quip on the basis of customer requirements. Much attention has been put into ergonomic aspects, flexible applicability and extensibility. As a basis a worktable is used, which can be extended with measuring uprisings, electrification (230/400V), instrument-consoles (for 19" equipment), electrical work height control,

lighting, soldering fume, etc. A client can customize the products and extend them to his own needs. The product is mainly used in the fields of R&D, service, maintenance, repair, calibration, small-scale production in the fields of electronics, such as appliances assembly, and in education.

Our customers can be found in the industry, utility companies, government, hospitals and technical/scientific & educational institutes.

REFERENCES

Amolf – TU-Delft – TU-Eindhoven – NXP – ASML – Intel – Fugro – Technolution – NUON powergeneration – Roy – NL Navy – Thales – TNO – RTD – Tokheim – DAF Trucks – Heineken – and many more.



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YOUR ENGINEERING –TO-PRE-ORDER PARTNER

Inno4Life specialises in complex customer-specific engineering-to-order projects for the Life Science Industries, namely the Pharmaceuticals (Human and Veterinary), Medical and Food Industries. Requests from other industries will be considered on a case-by-case basis.

Our knowledge is deeply rooted in the automated pharmaceutical packaging industry, we have therefore the in-built expertise, discipline and the very specific know-how to help overcome the evolving challenges constantly faced by our customers in highly regulated markets.

Relying on the combination of many years of experience and skills in managing large-scale international projects, we offer a complete range of solutions in the following areas:

- Equipment & Support
- System Integration
- System Optimization
- Expert Advice



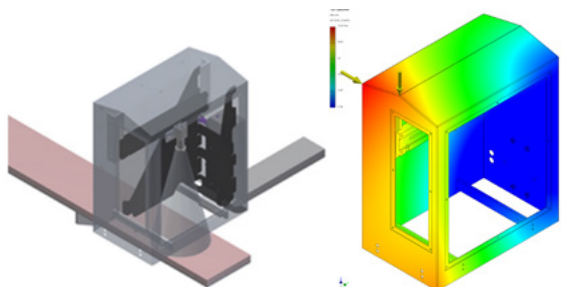
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We supply a wide range of equipment and services in the field of automated high-production:

- System & Module Development
- System architecture design
 - engineering
 - prototyping
 - test equipment
- System improvement
 - validation
- Assembly
- Installation
 - service support

Inno4Life specialises in complex customer-specific engineering-to-order projects for the Life Science Industries, namely the Pharmaceuticals (Human and Veterinary), Medical and Food Industries. Requests from other industries will be considered on a case-by-case basis. Our knowledge is deeply rooted in the automated pharmaceutical packaging industry, we have therefore the in-built expertise, discipline and the very specific know-how to help overcome the evolving challenges constantly faced by our customers in highly regulated markets.



OMNEO SYSTEMS

CONTAMINATION CONTROL FOR THE HIGH-TECH SUPPLY CHAIN

OMNEO offers a reliable contamination control system for the entire supply chain in the high-tech industry. We validate and control the production processes according to set standards and we develop innovative cleaning concepts.

WHY OMNEO

- The certainty of a proven measurement technique in according with standards as ASML GSA cleanliness grades
- The convenience of covering all chains in achieving cleanliness
- The ability to identify, count and classify contamination
- The availability of detailed and validated information to improve workspace and processes

CONSULTANCY & TRAINING

Every part of the process has an impact on the quality of the end product. We are happy to use our cleanliness expertise for you to increase your gross profit, increase your market share and/or reach a new target group.

PROCESS VALIDATION & CONTROL

Based on the set requirements and standards, we validate the steps of your production process with our validation test blocks and periodically check



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this with our control testblocks on the basis of an agreed schedule.

PDM PARTICLE DEPOSITION MONITORING

No matter how good your cleanroom and/or cleaning system is, you cannot prevent particle deposition on critical surfaces. By obtaining quantified and qualified data per time unit with our OMNEO-PDM you can determine whether your cleanroom and/or cleaning system meets the requirements.

RGA RESIDUAL GAS ANALYSIS

We design and realize custom RGA systems and apply the software we have developed ourselves. In our own laboratory we use an ultra-precise and unique RGA system for our test blocks for the various types of processing for the purpose of validating and controlling your processes.

CLEAN LOGISTICS

Preventing contamination after cleaning is therefore a challenge. This applies to both internal and external transport, as well as for handling and packaging. To prevent is better than to cure.

TRACK & TRACE

We have built a web-based portal that allows you to check, among other things, whether your supplier uses the right materials, performs the periodic RGA checks and chemical analyses you have requested.



THOMAS THOR ASSOCIATES

A BRIEF DESCRIPTION OF OUR BUSINESS AND MAIN AREAS OF EXPERTISE

Thomas Thor Associates provide Recruitment and Executive Search services to the global nuclear industry. Our clients include governments, regulators, utilities, operators, equipment manufacturers and supply chain organisations across the nuclear industry. With offices in Europe and the Middle East, we are set up to recruit nuclear professionals for our clients on an international scale. Our staff is multinational and multilingual and we have a live network of over 23,000 nuclear professionals globally.

WHAT MAKES US DIFFERENT TO OUR COMPETITORS?

- We are completely focused in the recruitment of professionals for the nuclear industry, both temporary and permanent staff.
- We have a successful track record in recruiting nuclear specialists for international clients and consortia.
- We are specialists in the international relocation of nuclear professionals.
- We represent multinational and multilingual experts in the nuclear industry.

Our network of candidates includes internationally mobile project and engineering specialists in new build, commissioning, operation and decommissioning in the following disciplines:

- Executive and Board Level Positions
- Project and Programme Management (design, construction and commissioning)

- Project Support and Control (Planning, Contract, Cost, Time Schedule)
- Safety (deterministic and probabilistic)
- Quality, Human Factors, Human Performance and Risk Management
- Licensing and Regulatory
- Process and Design Engineering
- Procurement, Supply Chain and Supplier Management
- Senior technical specialists – areas including I&C, HVAC, Thermo hydraulics, Reactor Physics
- Plant Operations and Maintenance
- Waste management and decommissioning strategy

THE SERVICES THAT WE OFFER

- Provision of interim/temporary consultants
- Recruitment of permanent staff (contingency, retained search, executive search and campaign management)
- Industry information and survey results



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