MORE LIGHT

Jenoptik
Capital Market Day 2018

Jena, February 8th 2018

Agenda

08:30 - 09:15	Welcome and introduction		*Dr. Stefan Traeger*
	Financials 2017		*Hans-Dieter Schumacher*
	Our STRATEGY 2022		*Dr. Stefan Traeger*
09:15 - 09:45	Photonics – a key enabling technology of Jenoptik		*Jay Kumler*
09:45 - 10:15	Q&A session		
10:15 - 10:45	--- COFFEE BREAK ---		
10:45 - 11:45	High-speed talks on our businesses	Part I	*Dr. Ralf Kuschnereit*
	_ _ _ _ _ _ _ _ _ _ _ _	Part II	*Volkmar Hauser*
	_ _ _ _ _ _ _ _ _ _ _ _	Part III	*Kevin Chevis*
	_ _ _ _ _ _ _ _ _ _ _ _	Part IV	*Dr. Stefan Stenzel*
11:45 - 12:00	**The new Jenoptik**		*Dr. Stefan Traeger*
12:00 - 12:30	Q&A session		
12:30 - 13:30	--- LUNCH ---		
14:00 - 16:00	Factory tour		

01

1.1
Welcome and introduction **Dr. Stefan Traeger**

1.2
Preliminary results 2017 for the Jenoptik Group Hans-Dieter Schumacher

1.3
Our STRATEGY 2022 Dr. Stefan Traeger

Highlights in 2017

- Acquisition of ESSA Technology, UK
- Grand opening of our new technology campus in Detroit, Michigan
- Acquisition of Five Lakes Automation, US

Strong growth and margin expansion in 2017

- Revenue of approx. 748 million euros → up +9.2% vs. prior year
- EBIT of around 78 million euros → Margin ~10.4%

01

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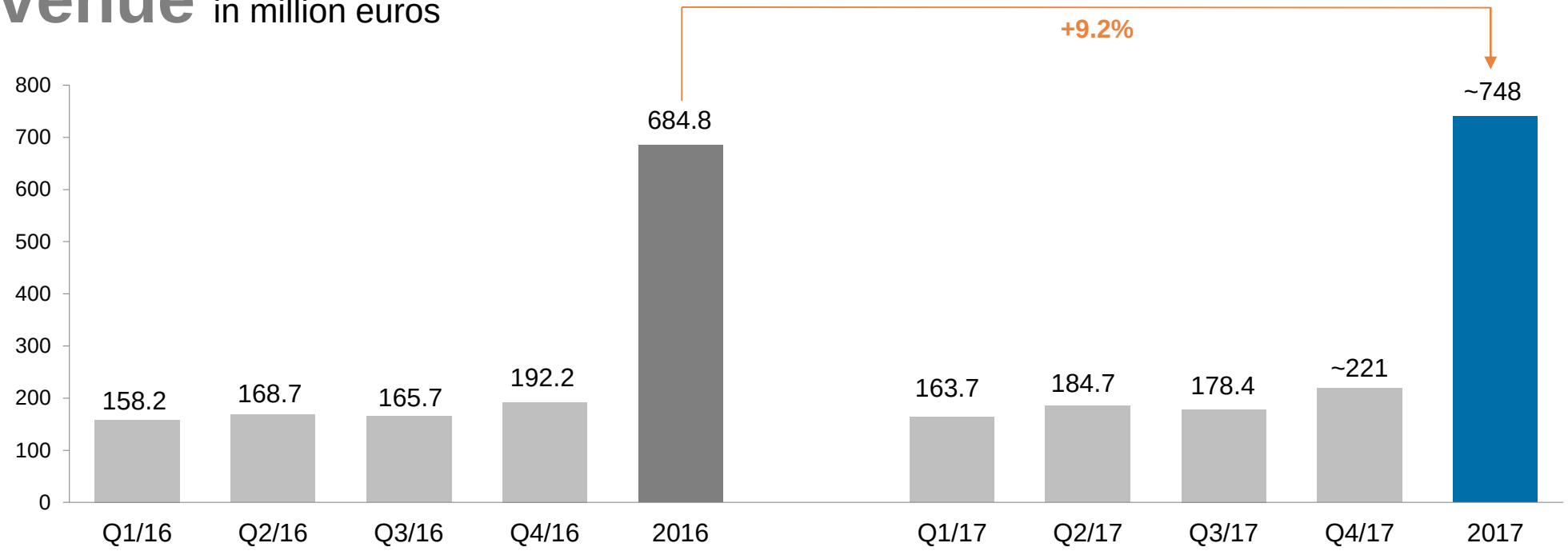
2017 - revenue showed stronger than expected growth

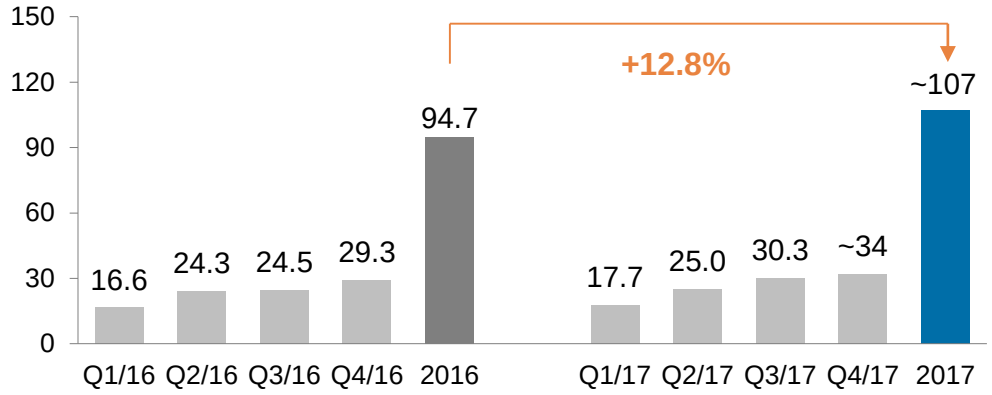
Revenue in million euros



- Growth in particular in the Optics & Life Science as well as Mobility segments
- Stronger demand for optical systems in the area of semiconductor equipment,
  but also for systems of the Healthcare & Industry area and for traffic safety solutions and regionally from the US

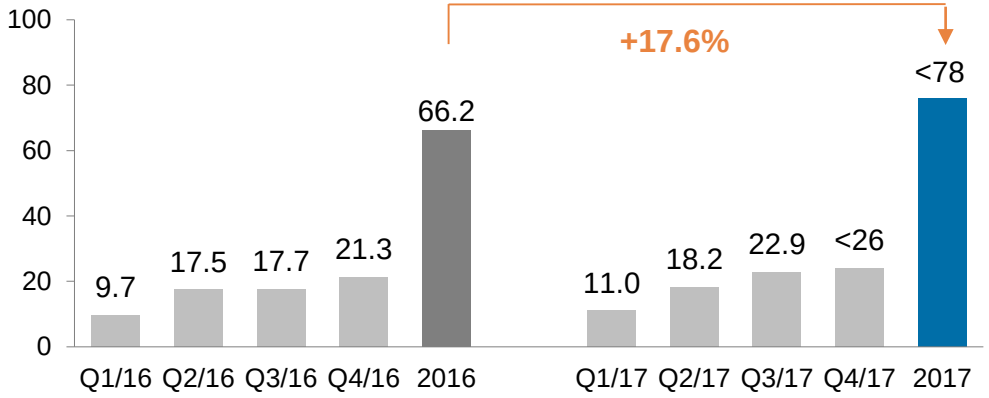
2017 - significant improvement of operating results

EBITDA* in million euros



- Stronger increase than revenue
- Continuous improvement in the course of the year
- EBITDA margin >14% (prior year 13.8%)

EBIT* in million euros

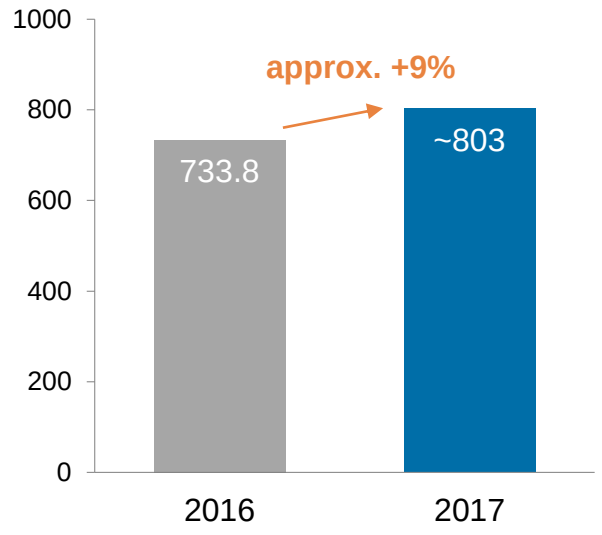


- EBIT also showed stronger growth than revenue
- EBIT margin at ~10.4% (prior year 9.7%)
- Rise due to a more profitable revenue mix
- Optics & Life Science segment with substantially higher EBIT contribution
- One-off expenses and ppa effects from acquisitions of Essa and Five Lakes Automation in the Mobility segment

* Continuing operations

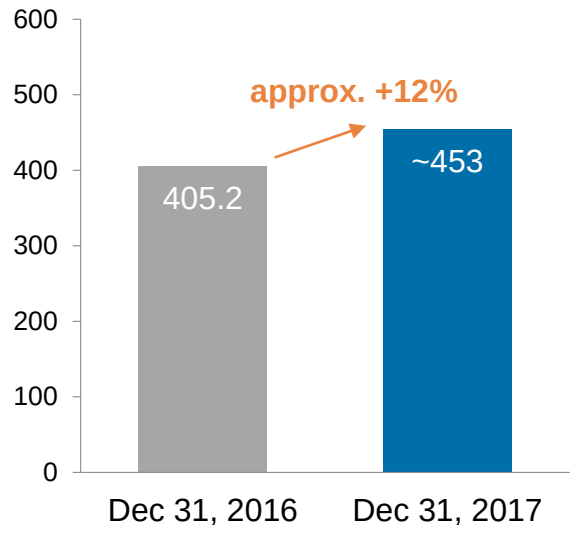
2017 - solid order position and project pipeline create good basis for further growth

Order intake in million euros



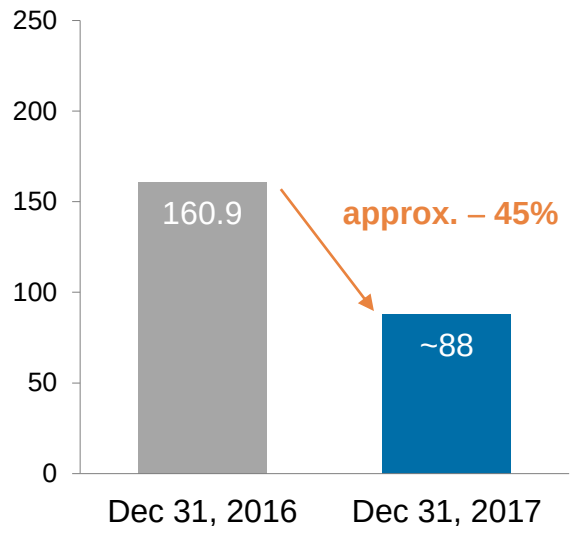
- Tailwind from Optics & Life Science as well as Mobility segments (e.g. toll enforcement project)
- Book-to-bill ratio clearly >1

Order backlog in million euros



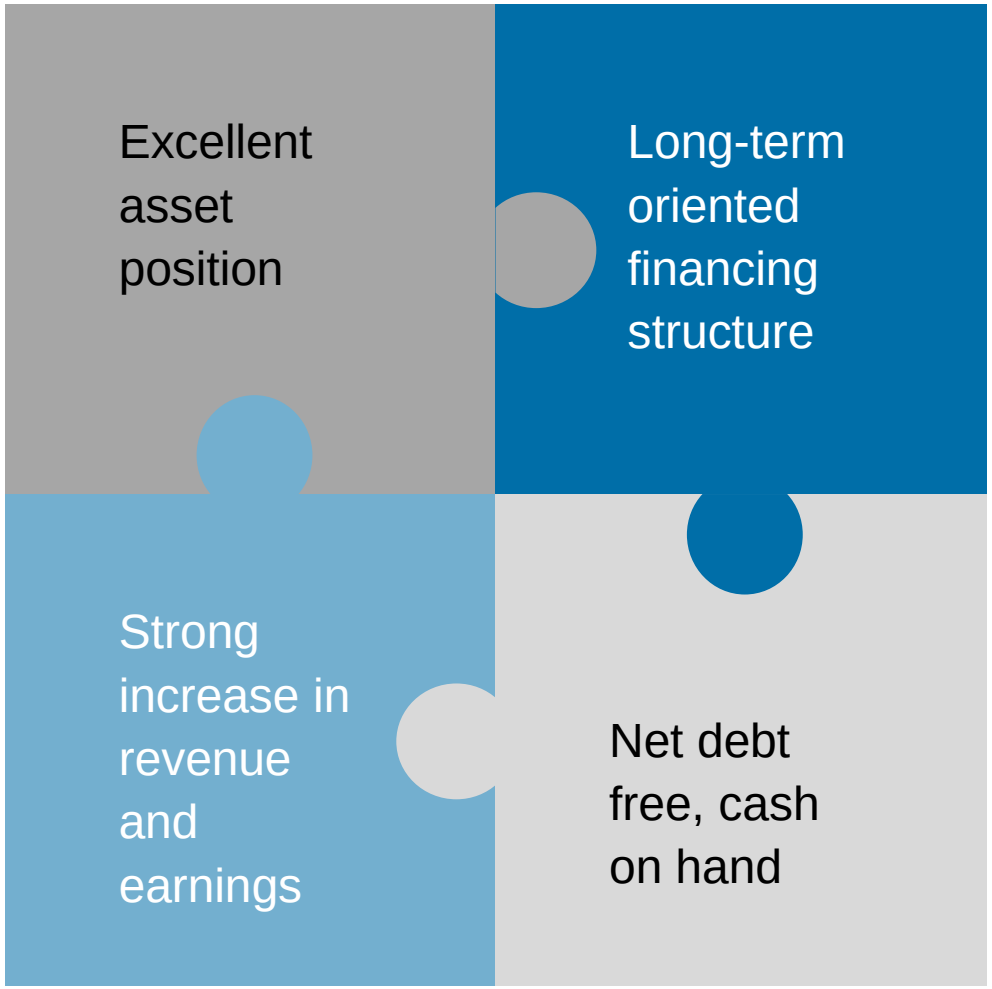
- Order backlog showed substantial rise
- Strong basis for 2018

Frame contracts in million euros



- Major orders in part recorded as frame contracts
- Decline due to reclassification as order intake and backlog

We have created a strong basis for further development



Financial and asset position provides sufficient leeway for both –
organic growth and acquisitions

01

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Our STRATEGY 2022 — **Dr. Stefan Traeger**

Transforming Jenoptik into a Focused Technology Group

Diversified Industrial Conglomerate

2007

Steering Jenoptik through difficult times:

- Managing the 2008 Financial Crisis
- Building a global infrastructure
- Net debt reduction

Focused Technology Group

2017

Strategy 2022

- MORE FOCUS
- MORE INNOVATION
- MORE INTERNATIONAL

We are in a strong financial position for accelerated growth and margin expansion.

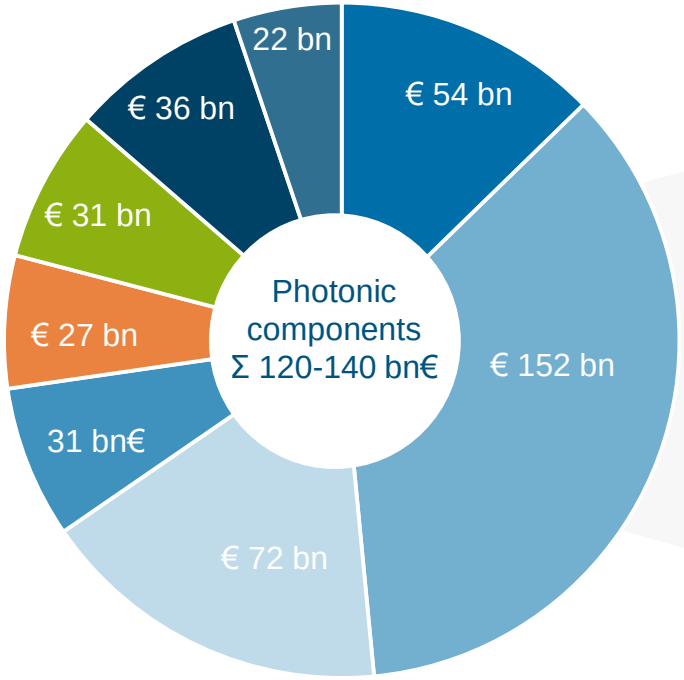
Transforming Jenoptik into a Focused Technology Group

Photonics – The Mastery of LIGHT

- an enabling technology, influencing almost all areas of our society
- is a global marketplace of ~ € 600 bn, growing 2x global GDP on average
- is at the Heart of Jenoptik

We will intensify our FOCUS on photonic technologies and manage our portfolio more actively.
Our non-photonic businesses will operate under a new independent brand.

Attractive photonic applications at the core of Jenoptik



World market in Photonics:

~ € 600 bn,
CAGR of ~5-6%

Jenoptik will particularly focus on:

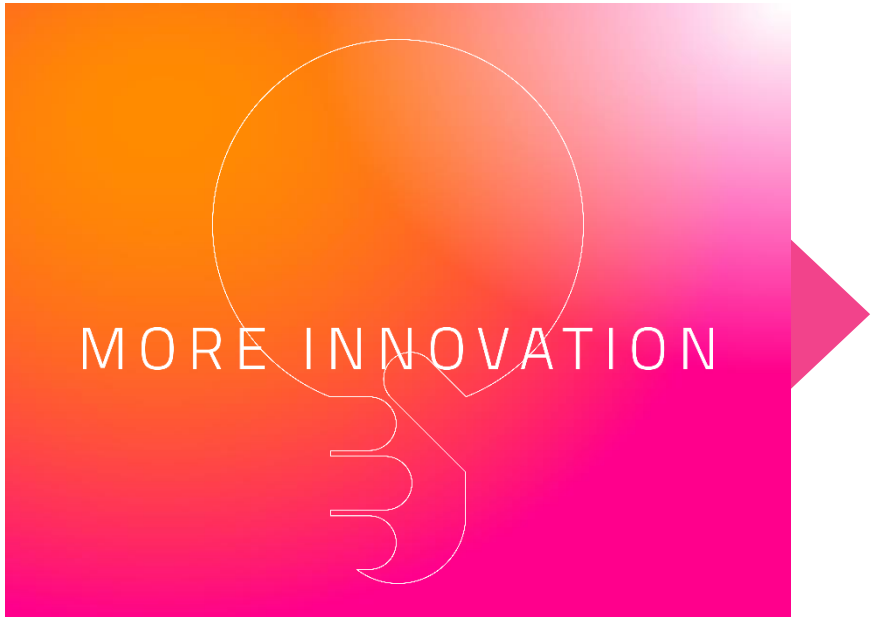
- Information processing (i.e. semiconductor equipment manufacturing and communication)
- Biophotonics
- Smart manufacturing
- Sensing, monitoring, measurement (public safety, traffic solutions)

- Solar PV & Alternative Energy
- Lighting & Displays
- Consumer & Entertainment
- Defense, Security, Law Enforcement
- Advanced Manufacturing
- Sensing, Monitoring, Measurement
- BioPhotonics
- Optical Information Processing

Source: SPIE (2016), Agileon Strategic Consultancy

We aim at photonic applications allowing for technical differentiation.

Transforming Jenoptik into a Focused Technology Group



Stepping-up our R+D work

- Enhancing our application know-how and expertise by establishing application centers in all major geographies
- Higher level of R+D: By 2022 we will spend ~10% of sales on innovation and product development

We will nurture a culture of MORE INNOVATION:
Faster development cycles – more freedom to explore – encouraging competition of ideas

Transforming Jenoptik into a Focused Technology Group

Building a truly global enterprise

- Expanding our business in Asia, with particular focus on China
- Local R&D teams in all major markets and production facilities in all regions
- At least one of our divisions will have its headquarters outside of Germany

We create an INTERNATIONAL culture in a diversified leadership team.

Transforming Jenoptik into a Focused Technology Group

Strategy 2022: three pillars for growth and margin expansion

Leveraging our core competencies in Optics & Photonics

Stepping-up our R&D work

Building a truly global enterprise

Our new structure starting 2019: Focused Divisions and Technology Synergies

Photonic ……. Mechatronic

Division	LIGHT & OPTICS OEM-Business	LIGHT & PRODUCTION B2B-Business	LIGHT & SAFETY B2G-Business	"New-DCS" A member of Jenoptik Group
Characteristics	 – Design & Manufacturing **Business Partner for OEM customers** – Provides optical components, modules and systems for applications in the **Semiconductor Manufacturing Space, the Communication Segment and in Biophotonics**	 – **Engineering Business** offering products, services and solutions for industrial consumers – Focuses on **Smart Manufacturing and Process Automation** using primarily Optical and Photonic technologies	 – Provider of imaging-based solutions for **Public Safety** – Uses image and video analysis skills, deep learning technologies and data management **solutions** – Offers „**Soup to nuts" services** for public customers around the globe	 – Member of Jenoptik Group which offers services and solutions under its **own brand**, which fits best to its specific commercial needs – Focuses on **electro-mechanical solutions** for partners in the **Aviation and Security Industry**
	Merger of Optical Systems and Healthcare & Industry divisions	Today's Automotive division	Today's Traffic Solutions division	Carve-out from DCS division (Aviation, Power Systems, Energy&Drive)

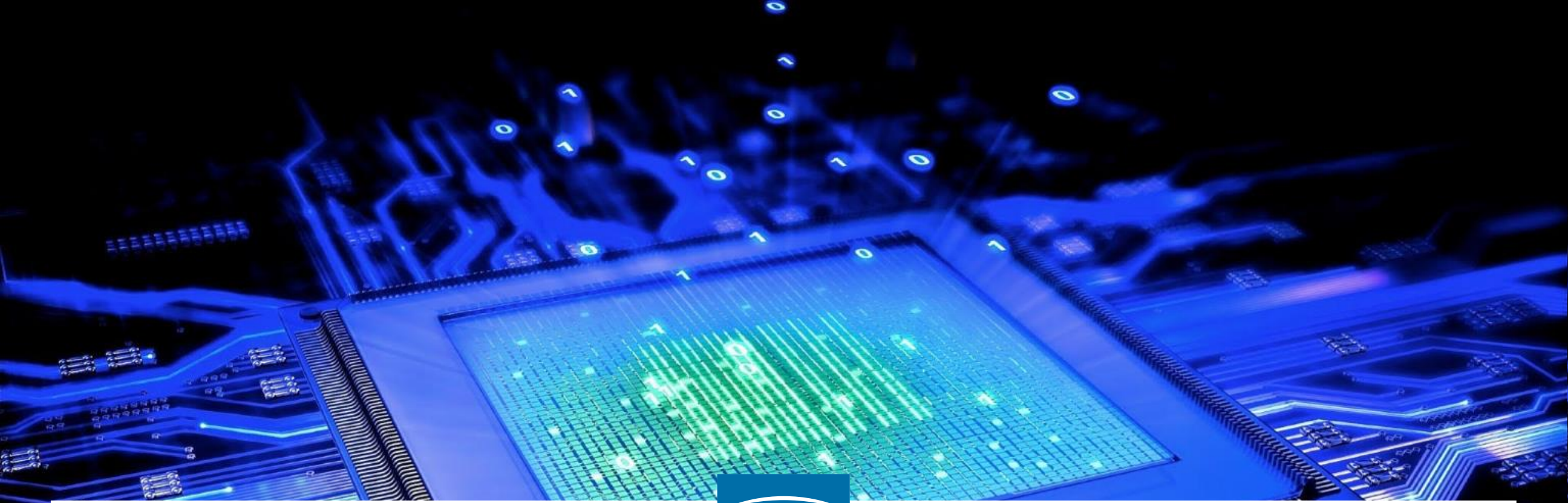
We will prepare the move in 2018 and start reporting in the new structure in 2019.

02

2.1
Photonics – a key enabling technology of Jenoptik

Jay Kumler

- Discuss Photonics and its enormous technological and economical potential
- Discuss Jenoptik`s key technologies and skills in photonics

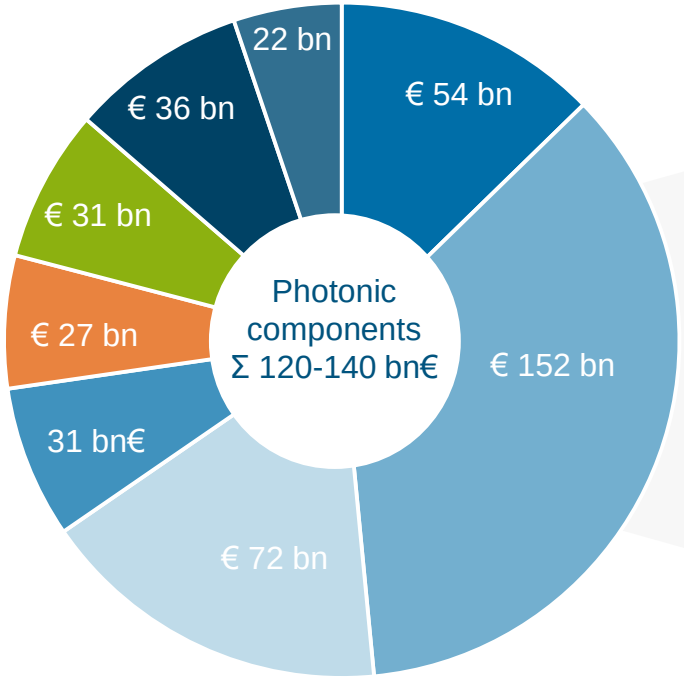


Jenoptik Capital Markets Day 2018

PHOTONICS – ENABLING TECHNOLOGY AT THE HEART OF JENOPTIK

Jay Kumler | Feb 8th 2018

Attractive photonic applications at the core of Jenoptik



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- Optical information processing
- BioPhotonics
- Smart manufacturing
- Sensing, monitoring, measurement

- Solar PV & Alternative Energy
- Lighting & Displays
- Consumer & Entertainment
- Defense, Security, Law Enforcement
- Advanced Manufacturing
- Sensing, Monitoring, Measurement
- BioPhotonics
- Optical Information Processing

Source: SPIE (2016), Agileon Strategic Consultancy

We aim at photonic applications allowing for technical differentiation.

Photonics impacts all of our lives

Live Longer – Photonics in Health Care

Detect disease early when it can be cured

- Diagnostic instruments
- Optical coherence tomography
- Lasers for ophthalmology
- Modular imaging platforms

Smarter and Safer Transportation

Photonic building blocks for smart roads and cities

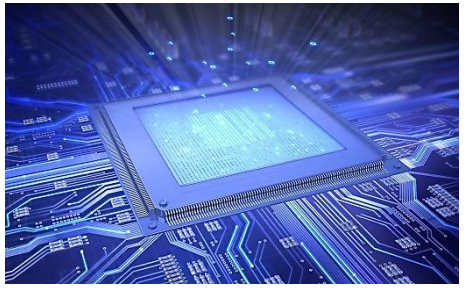
- Red light enforcement
- Speed control
- License plate recognition
- LiDAR (Light Detection And Ranging)

Smarter Factories

Precision laser machines and optical metrology

- Laser Material Processing
- Perforating, cutting and welding with lasers
- Integrated metrology
- In-line Optical inspection

Enabling the digital world



Faster communications for more people, better displays

- Critical components for next gen transceivers
- Silicon photonics
- Organic Light-emitting Diode (OLED) display inspection
- Free space optical communications

JENOPTIK's Photonics Qualifications

Photonics Innovation

- Strong IP portfolio
- Global reach
- Deep expertise in regions
- Able to recruit the top talent

Live Longer – Photonics in Health Care

Photonics is improving human health by unlocking the power of the genome. Our focus on innovation has established Jenoptik as a global OEM leader in DNA sequencing and array-based technologies, serving customers in the research, clinical and applied markets. Our customer's products are used for applications in the life sciences, oncology, reproductive health, agriculture, and other emerging segments.

Optical coherence tomography (OCT) is now the dominant diagnostic tool for conditions like macular degeneration and glaucoma. OCT is now being applied in areas of gastroenterology, dermatology and oncology.

Jenoptik Lasers enable Medical Applications & Solutions

Diagonstics
& Therapy

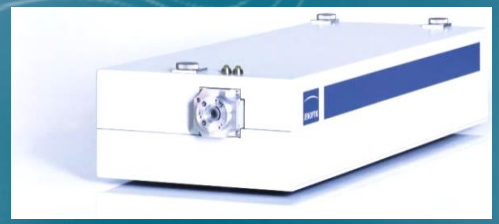
Skin Treatment

Ophthalmology

Surgery
& Endoscopy

Femtosecond Lasers

Picosecond Lasers



Nanosecond Disk-Lasers

Nanosecond Fiber-Lasers

PROGRES GRYPHAX® series
microscope cameras

JENOPTIK

PROGRES GRYPHAX® SUBRA

KEY FACTS

- Full HD microscope camera with 30 fps
- 5.5 x 5.5 µm pixel size
- 2/3" sensor
- Global shutter
- Software included

PROGRES GRYPHAX® PROKYON

KEY FACTS

- True color microscope camera 20.7 I 9.2 I 2.3 MPix
- 60 fps at 2.3 MPix
- Pixel size 5.86 x 5.86 µm
- Dynamic range 73.3 dB
- 1/1.2" SONY sensor (back-illuminated)
- Global shutter
- Software included

PROGRES GRYPHAX® ARKTUR

KEY FACTS

- 3.8 MPix microscope camera with 8 MPix option
- 30 fps at 8 MPix
- Fits perfectly to 4k monitors
- Dynamic range 66 dB
- 2/3" sensor
- Software included

PROGRES GRYPHAX® NAOS

KEY FACTS

- 5 MPix microscope camera with 20 MPix option
- 30 fps at 5 MPix
- Dynamic range 71.8 dB
- 1" sensor
- Software included

PROGRES GRYPHAX® KAPELLA

KEY FACTS

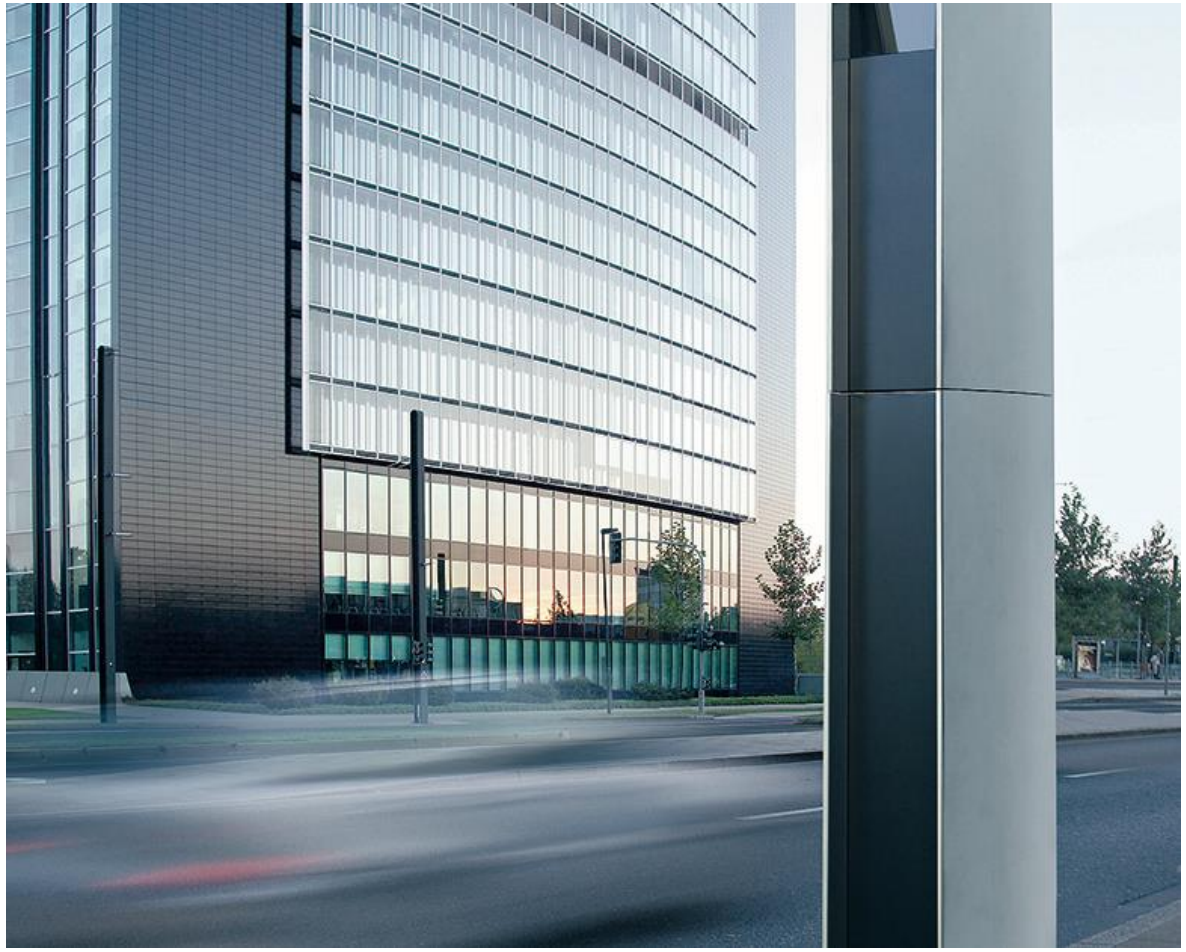
- Color microscope camera 2.3 MPix with 60 fps
- Pixel size 5.86 x 5.86 µm
- Full HD record at video speed
- Dynamic range 73.3 dB
- 1/1.2" SONY sensor (back-illuminated)
- Global shutter
- Software included

PROGRES GRYPHAX® RIGEL

KEY FACTS

- Monochrome microscope camera 2.3 MPix with 60 fps
- Pixel size 5.86 x 5.86 µm
- Dynamic range 73.3 dB
- 1/1.2" SONY sensor (back-illuminated)
- Global shutter
- Software included

Smarter and Safer Transportation



Safer roads with speed control and red light enforcement

LiDAR platform for autonomous vehicles

State-of-the-art systems allow to improve road traffic safety

Traffic Solutions

- The world's widest range of sensor technologies: lasers, radar, piezo sensors, induction loops
- Supplier for whole process chain of traffic law enforcement
- More than 30,000 installed systems in over 80 countries
- Areas of application
  - Stationary and mobile systems for speed and red light monitoring
    - Global No 1 for mobile and stationary traffic safety equipment
  - Measurement of average speed
  - Automatic license plate recognition for police and civil enforcement
  - Toll monitoring systems
  - Reliable and efficient modular back-office software for evaluating traffic monitoring data
- Traffic Service Provision: Financing and service solutions for your traffic safety projects

I3S – JENOPTIK LiDAR Scanner

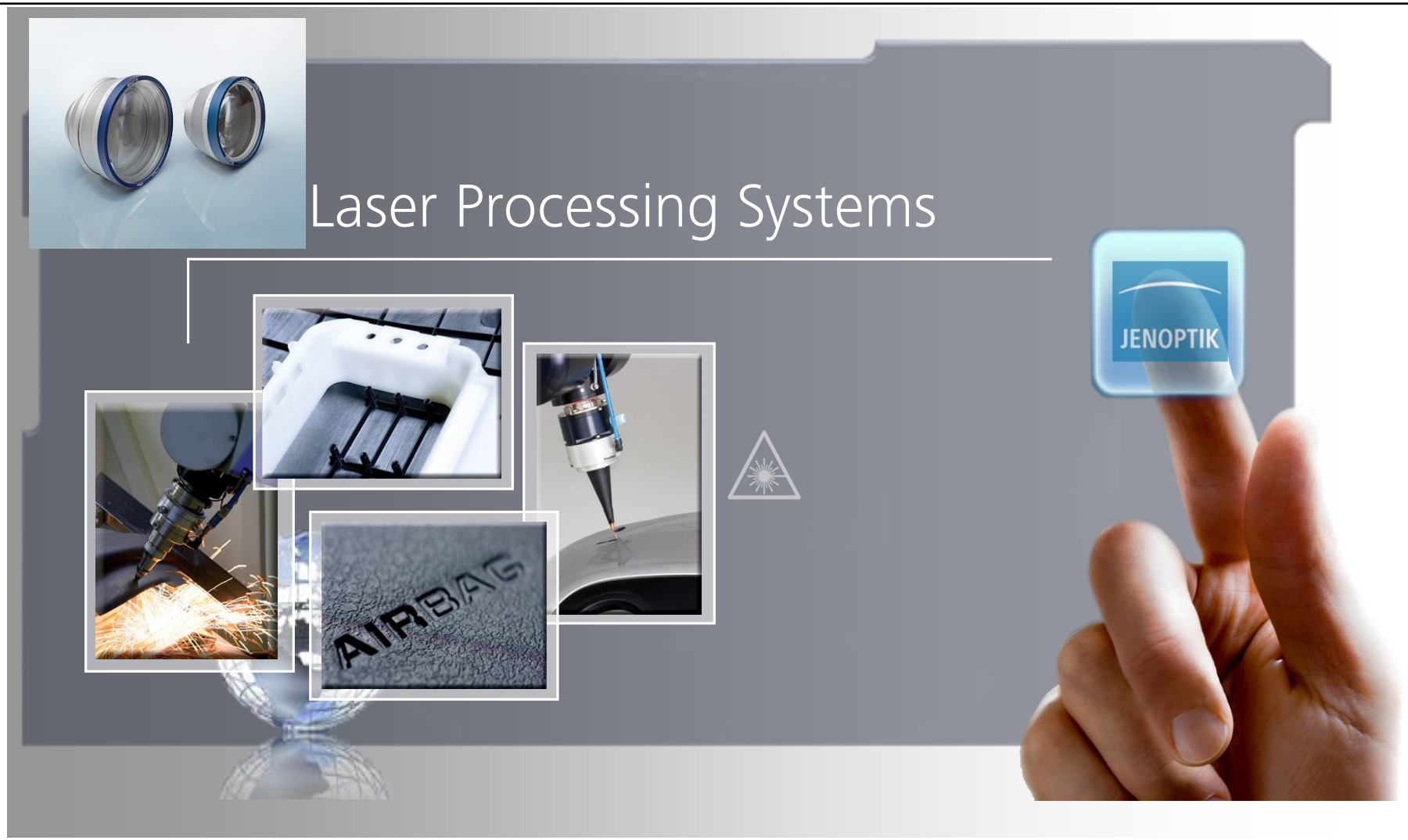
Industrial Automation and its latest trend Industry 4.0 requires reliable and immediate information for process control – for example, for guiding autonomous, driverless transportation vehicles delivering valuable goods. Environmental data collected by 3D LiDAR Scanners turn out to be vital for navigation and collision avoidance.

Our new I3S 3D LiDAR Scanner will play an important role not only in industrial automation and industrial safety, but also in public safety and security applications, for object protection, or surveillance.

Applications

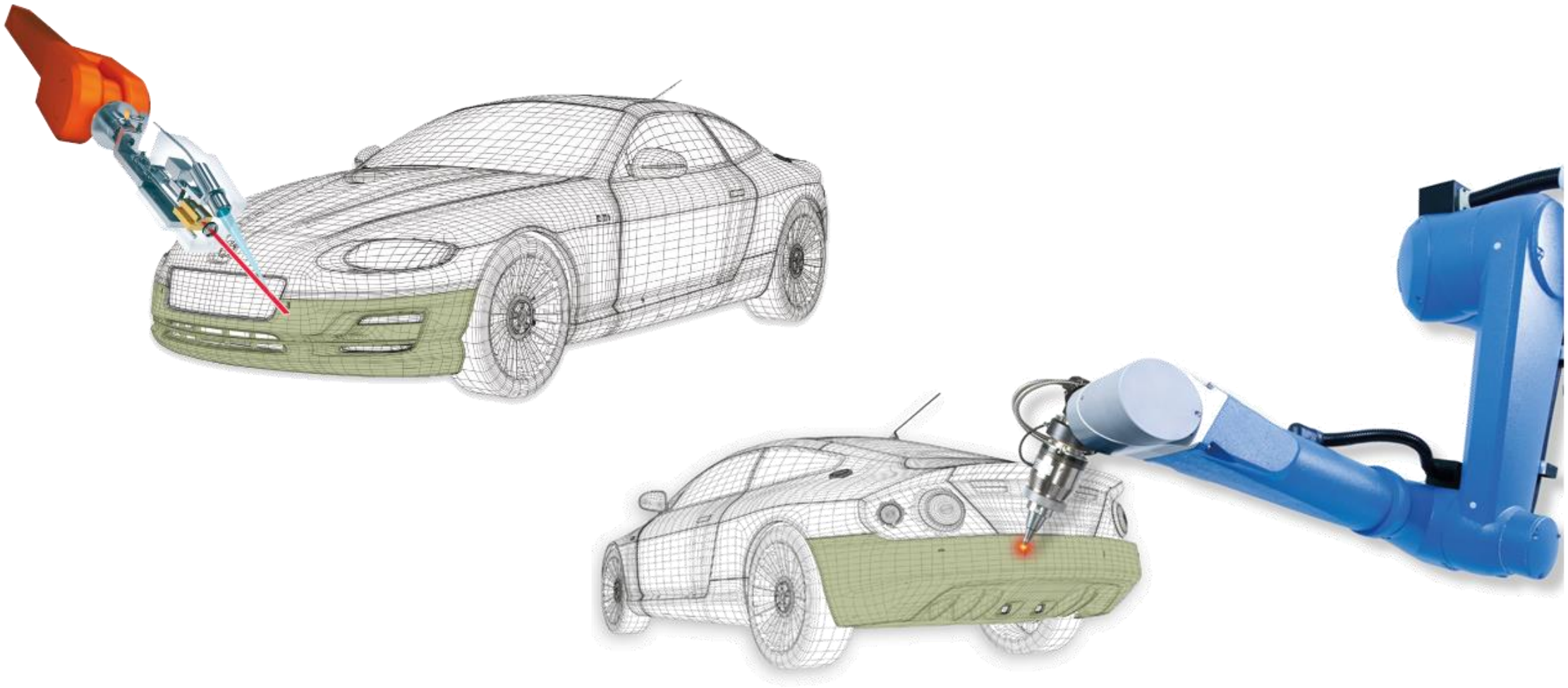
- Industrial automation, transport and logistics
- Driverless, autonomous transportation systems
- Unmanned Aerial Vehicles (UAV, drones)
- Unmanned Ground Vehicles (UGV)
- Autonomous agricultural machines
- Public safety & security, surveillance, object protection

Smarter factories



JENOPTIK-VOTAN®BIM & JENOPTIK-VOTAN®W

Laser processing systems for bumper cutting and welding

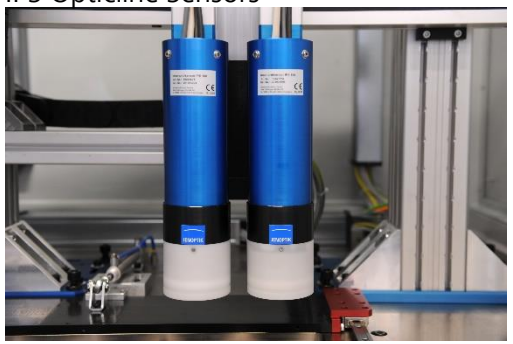


Photonics-enabled inspection in automotive industry

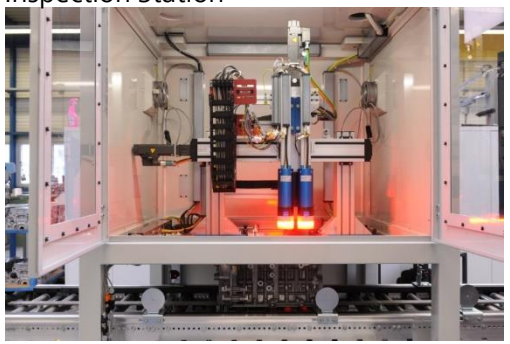
JENOPTIK IPS100 HR – Surface inspection of bores in engine blocks

- Automated part handling and measurement of engine blocks (In-line)
- 360 degree optical inspection, with focus module and LED ring illumination
- Control software with GUI interface
- Detects scratches, porosities, holes, defects
- 100+ systems installed worldwide

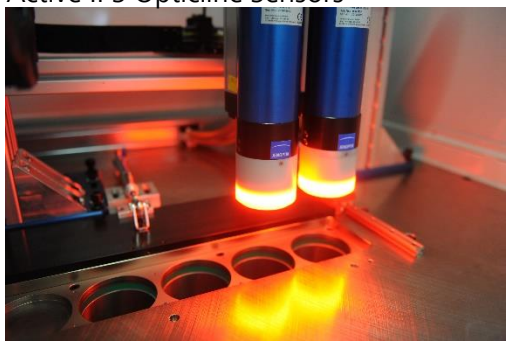
IPS Opticline Sensors



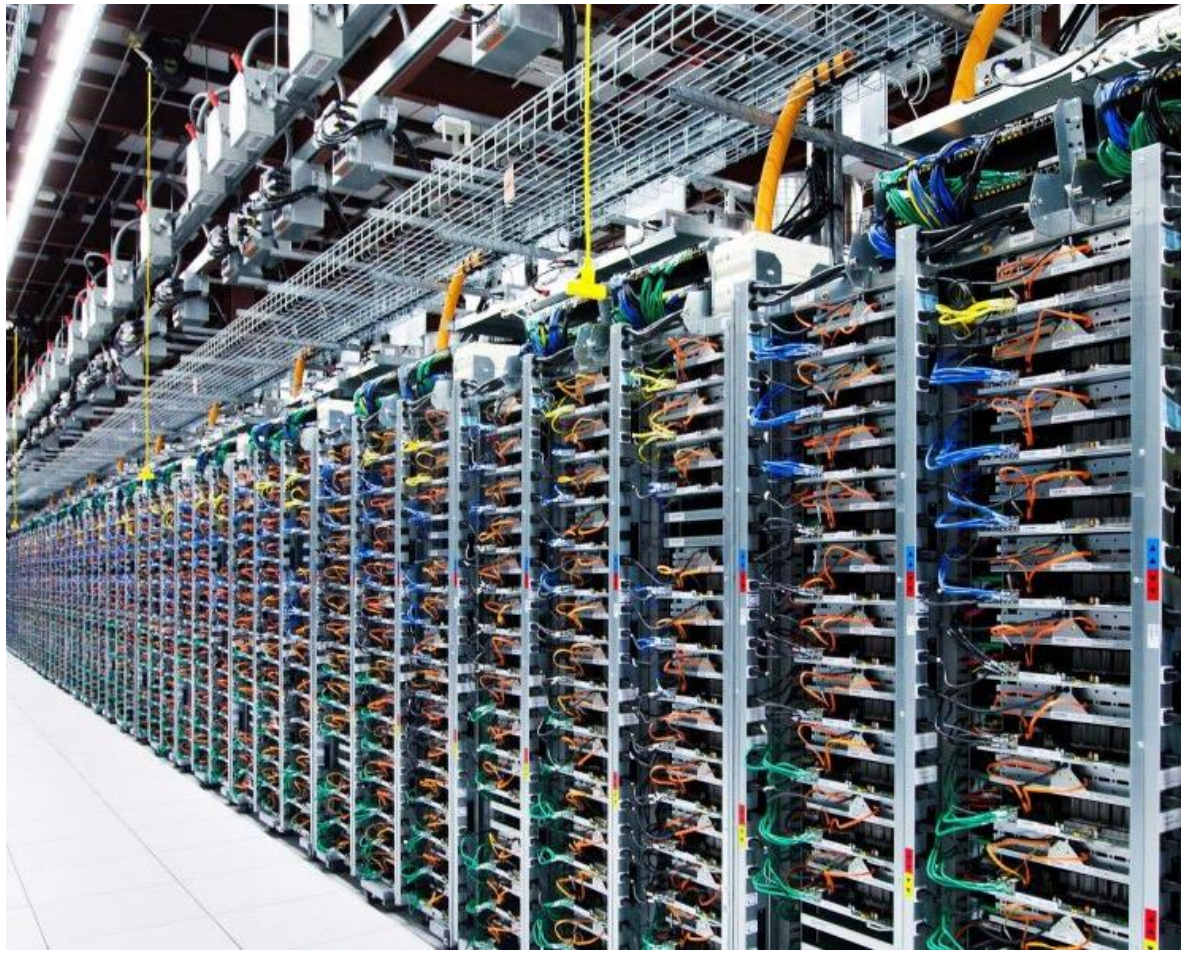
Inspection Station



Active IPS Opticline Sensors



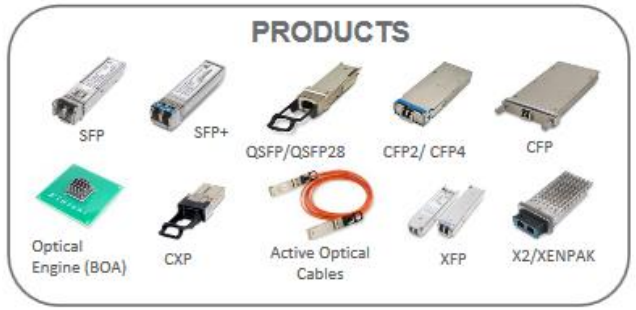
Enabling the Digital World

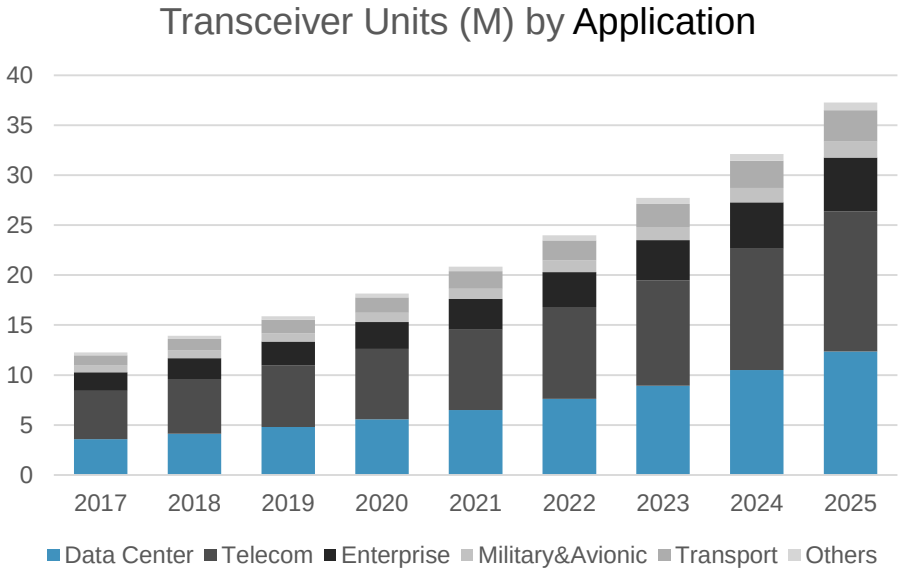


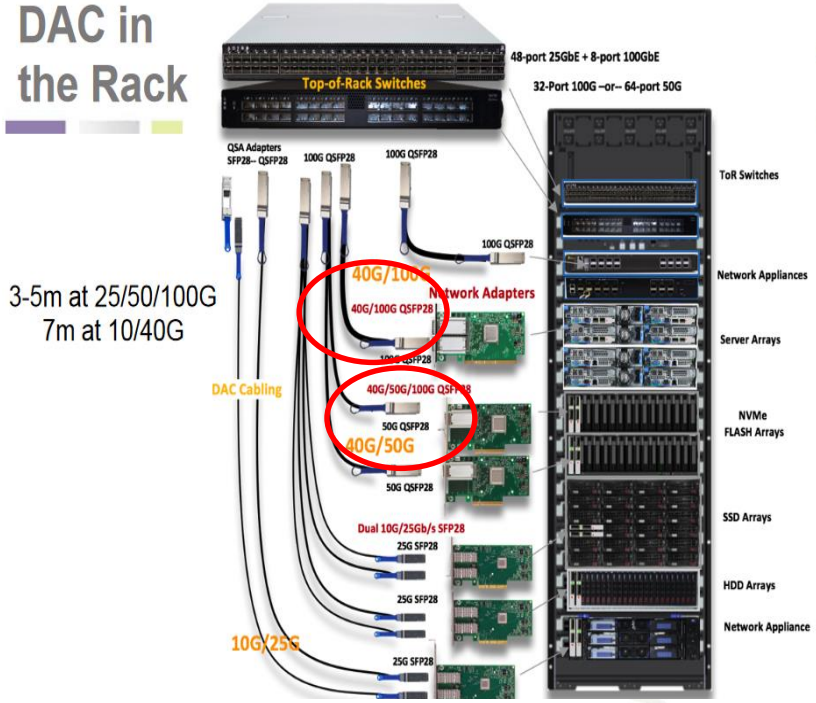
Hyper scale data center

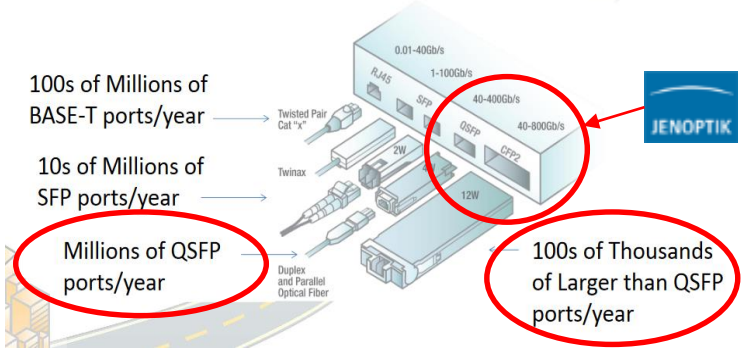
OLED displays

Jenoptik Products enabling Hyperscale Data centers









2017 Ethernet Roadmap for Networked Storage presentation (Association for Storage networking).

The State of Ethernet Optics" from Ethernet Alliance.org

JENOPTIK Products enable manufacturing and testing of Consumer Electronics

OLED Flat Panel Display inspection

The desire for thinner, better, more power-efficient and sharper displays in consumer electronics has fueled the demand for OLED displays.

Flexible OLED displays are the next progressive step in the technology's evolution.

Jenoptik delivers R-G-B imaging systems with diffraction limited performance and extended depth of focus.

JENOPTIK Products make ubiquitous broadband possible
New Development Projects with Google X

- AP State FiberNet announced that they'll be rolling out two thousand free-space optical communications links created by Google X.
- These FSOC links will form part of the high-bandwidth backbone of their network, giving them a cost effective way to connect rural and remote areas across the state. The links will plug critical gaps to major access points, like cell-towers and WiFi hotspots, that support thousands of people.
- Andhra Pradesh, a state in India which is home to more than 53 million people.
- **Less than 20% of residents currently have access to broadband connectivity**

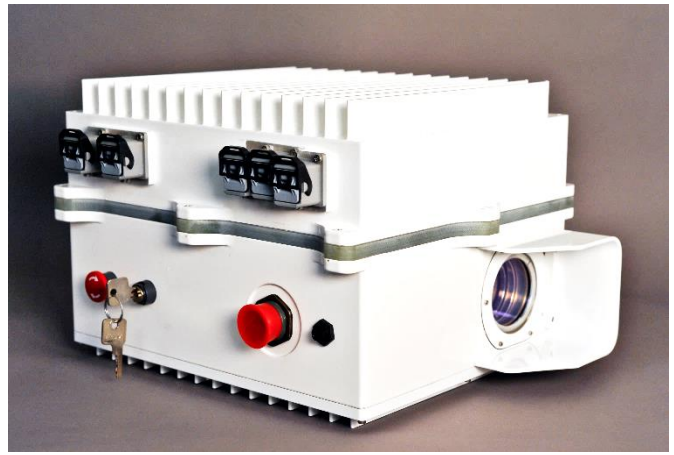
Google signed MoU with Andhra Pradesh (India)
To supply high speed internet to households, schools and public health centers

AP Fiber grid is an ambitious project launched to give affordable high-speed internet connection to every household in the state.

The pilot project aims to connect
- 14.5 million households
- 12,198 Panchayats (village councils)
- 60,000 schools
- 10,000 government offices
- 6,000 Public Health Centers with high-speed internet.

"This association with X labs to implement FSOC in AP is first of its kind in the world to provide wireless internet connection at a higher speed of up to 20Gbps and to a distance of up to 20kms.

This significant partnership will offer a major boost to the state's digital infrastructure and help overcome hindrances in terms of connecting isolated and difficult terrain, forest areas, river crossings, and railway crossings" said Andhra Pradesh IT minister Nara Lokesh.



Top photo credit Jenoptik
Bottom photo credit Google X, used with permission

Awarded and Active Photonics Patents

JENOPTIK AG

1,248 Active patents
in
465 Patent families

Optical Systems Division

274 Active patents
in
152 Patent families
+
85 Patents in progress

Health Care Division

148 Photonics patents

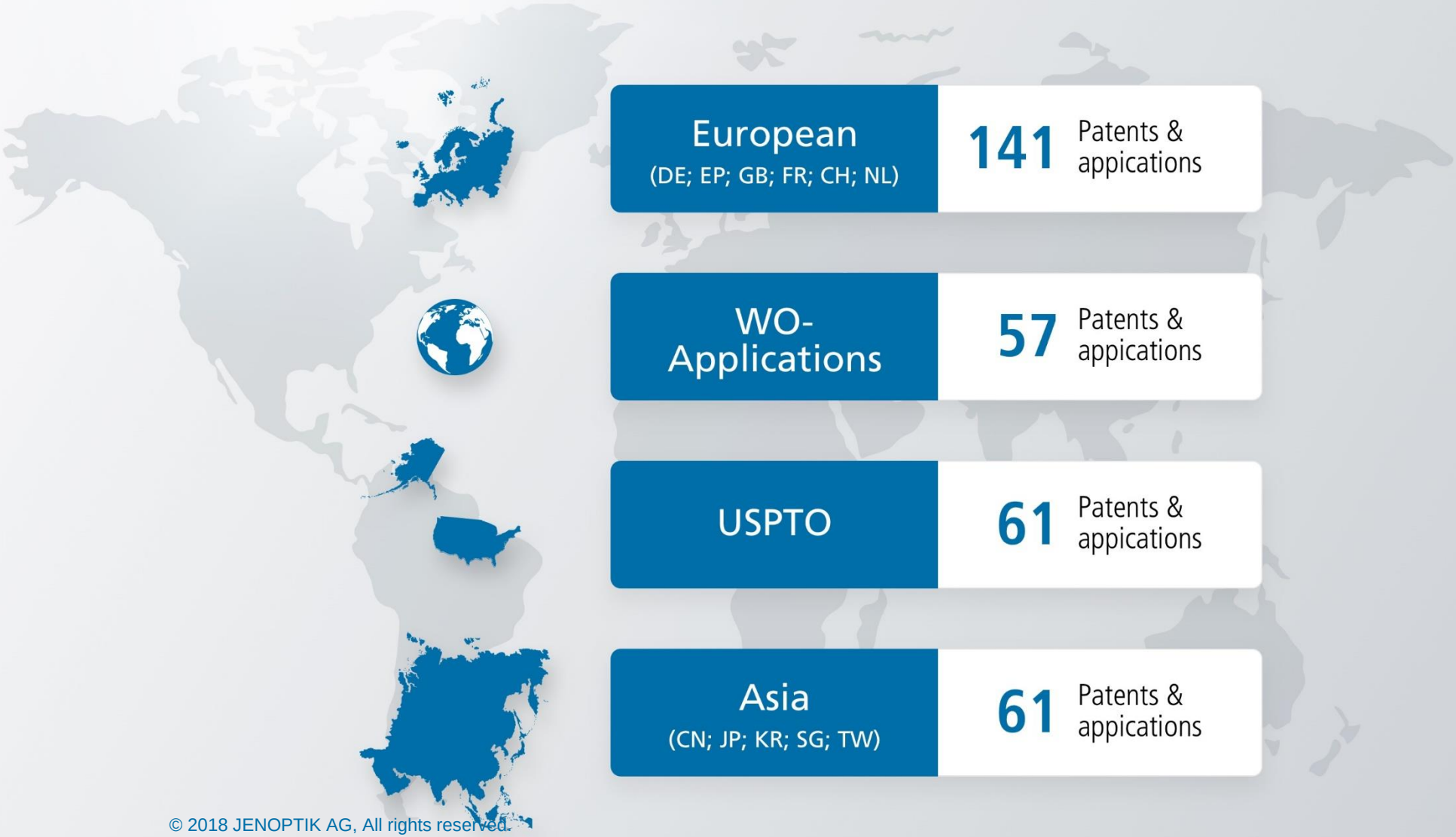
Defense Division

20 Photonics patents
in
6 Patent families

Traffic Solutions Division

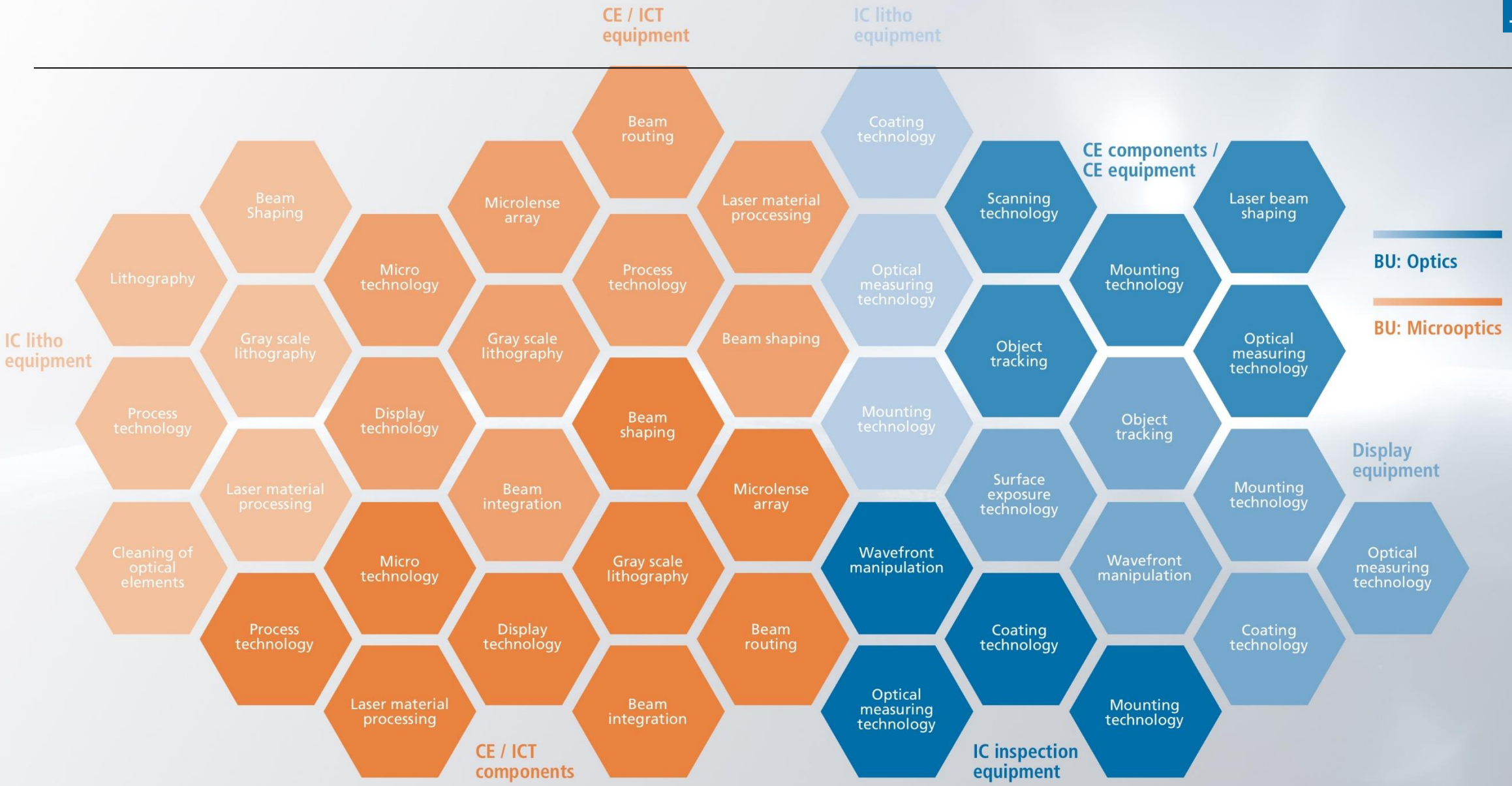
16 Photonics patents
in
5 Patent families

Optical Systems Division Patents

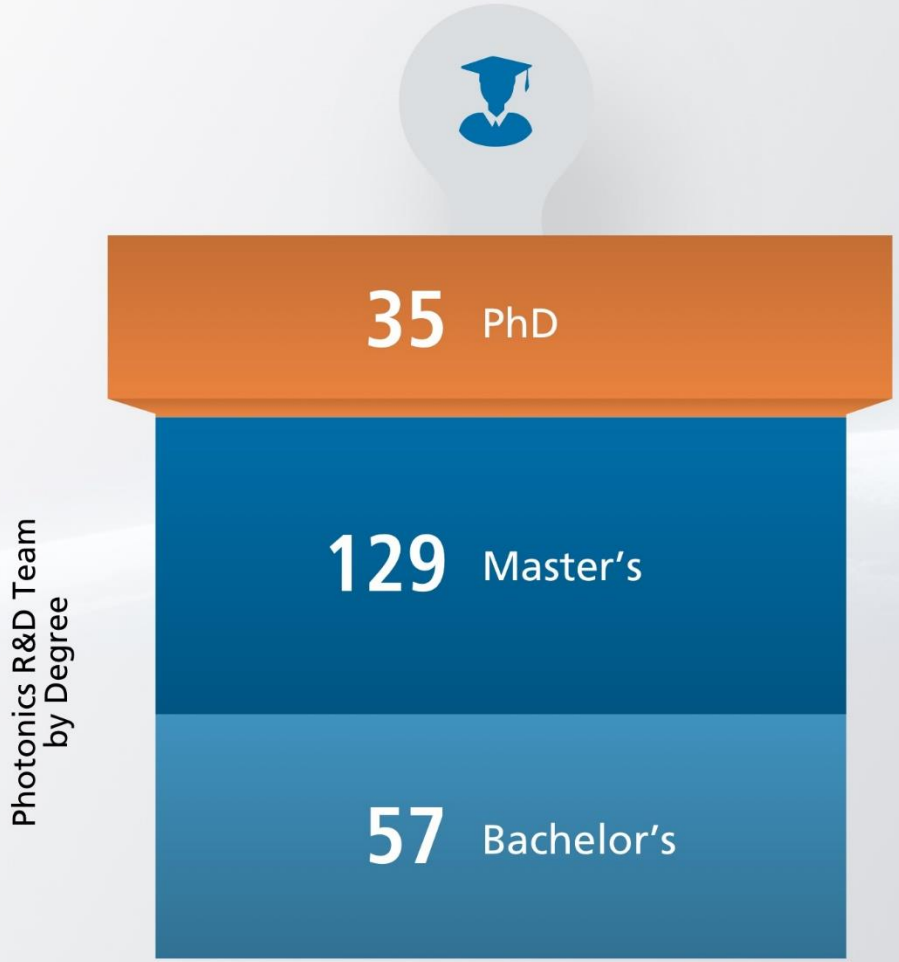


European (DE; EP; GB; FR; CH; NL)	141	Patents & appications
WO-Applications	57	Patents & appications
USPTO	61	Patents & appications
Asia (CN; JP; KR; SG; TW)	61	Patents & appications

Photonics IP Portfolio



Elite Talent from Elite Schools



Massachusetts Institute of Technology

Karlsruher Institut für Technologie

University of Rochester

Freie Universität Berlin

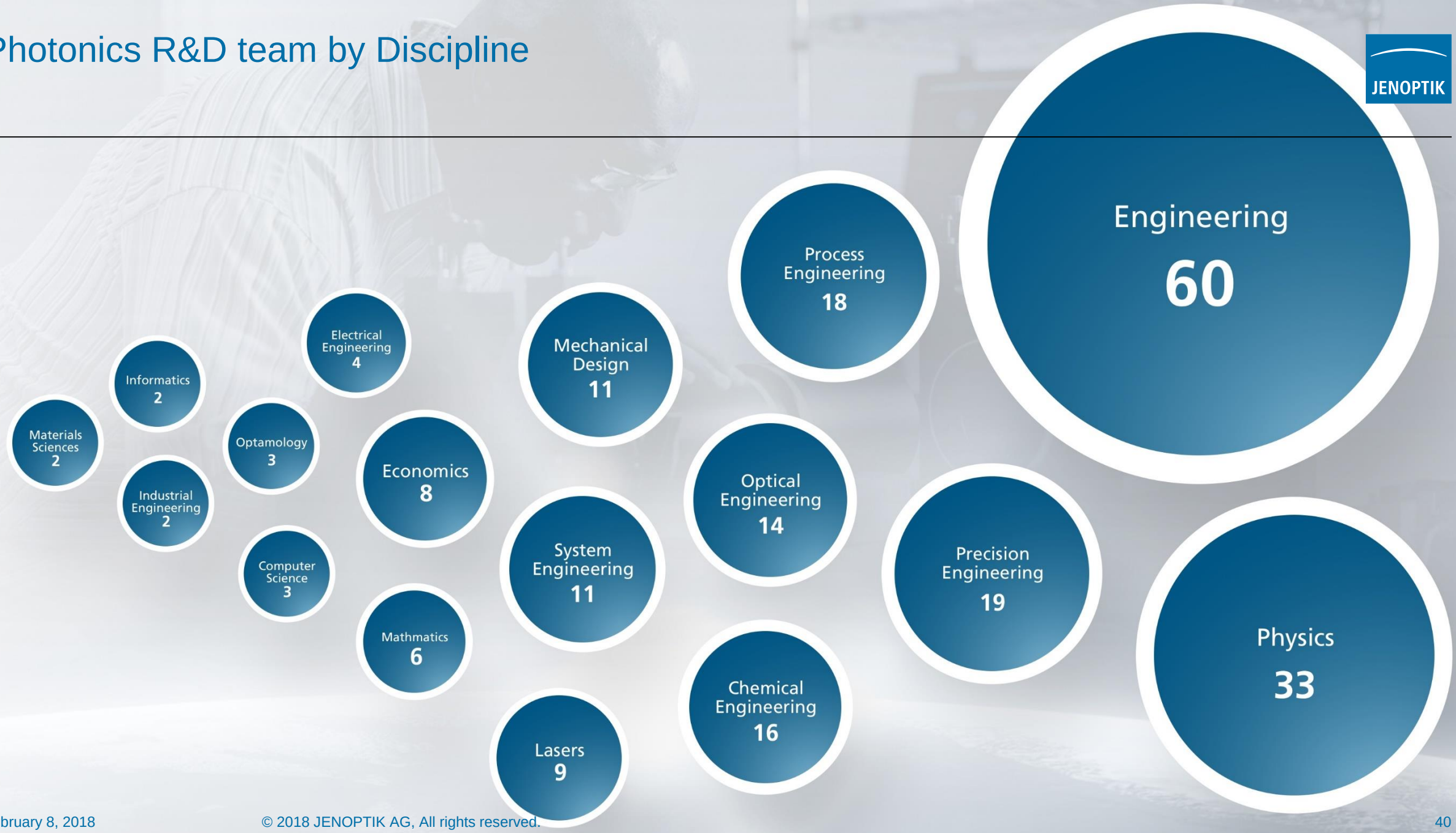
The University of Arizona College of Science

Technische Universität Ilmenau

RWTH Aachen University

Friedrich-Schiller-Universität Jena

Photonics R&D team by Discipline



Jenoptik Optics on Mars Rover 2020

Space Flight Hardware

JENOPTIK Optical Systems designed and is manufacturing lenses for the engineering cameras on the Mars Rover being launched in 2020.

Hazcam, Navcam and Cachecam.

All three designs incorporate sub cells, utilizing our in-house cell turning capability to control critical interface datum

JENOPTIK provided the optical and mechanical design, and the FEA analysis.

JENOPTIK is performing the assembly, alignment and system testing of the lenses.

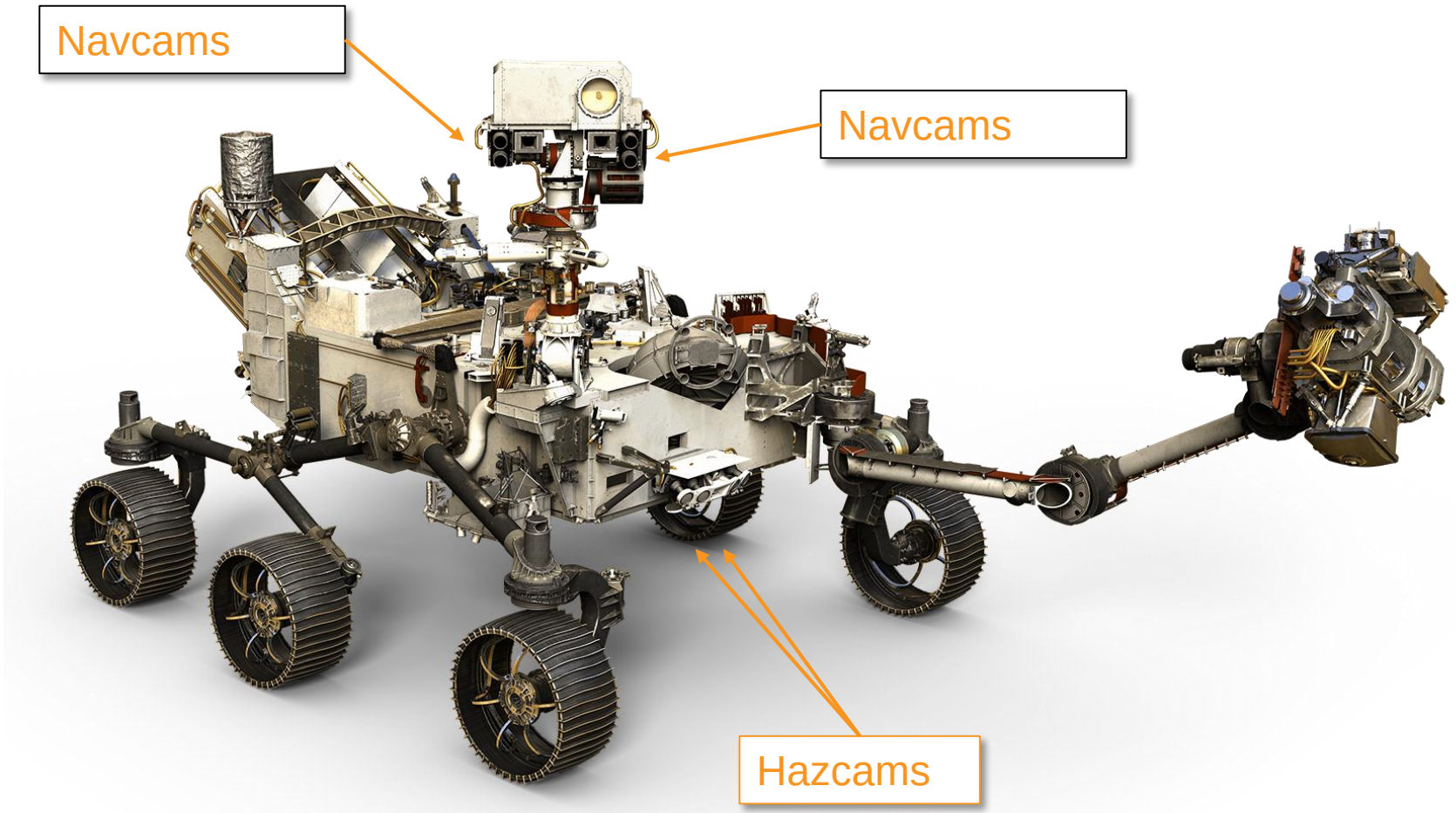


Image used with permission of NASA Jet Propulsion Laboratory

Photonics is moving markets and changing the world around us.

Jenoptik has the skills, experience and proven track record to lead the way

Time for discussion

Coffee break.

The webcast will be continued at approx. 10:45.

03

3.1
Our new OEM-partnering business **Dr. Ralf Kuschnereit**
Developing our OLS segment into a design and manufacturing business partner for customers in semiconductor manufacturing, optical communication, and biophotonics

3.2
Automotive division – our new engineering business Volkmar Hauser

3.3
Our new public safety business Kevin Chevis

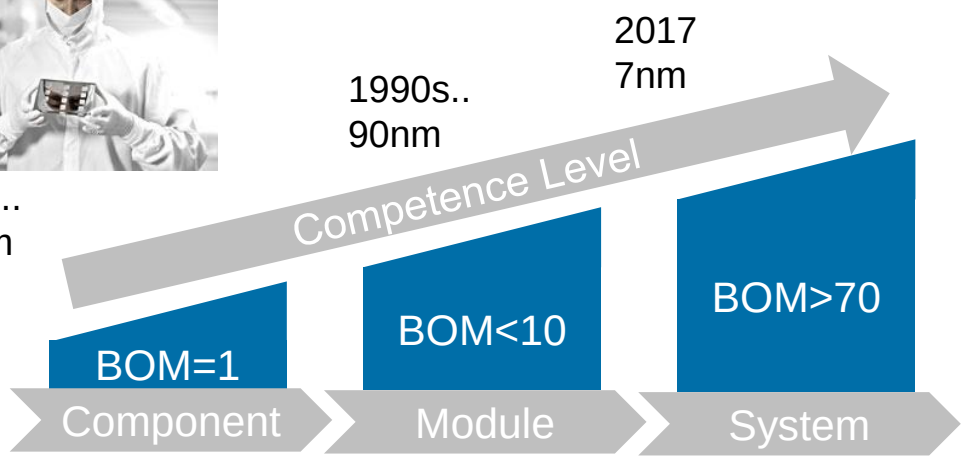
3.4
Our new mechatronic business Dr. Stefan Stenzel

Jenoptik Capital Market Day 2018

Developing our OLS segment into a Design and Manufacturing Business Partner for customers in Semiconductor Manufacturing, Optical Communication, and Biophotonics.

Dr. Ralf Kuschnereit | Feb 8th 2018

Jenoptik has a unique position in a promising OEM market



OEM customers

- approach us for high end optical systems
- require more and more systems competence
- are looking for turn key solutions

next generation optical communications CAGR 15%

VR/AR CAGR>20%

new OEM customers

digital platform CAGR 15%

in vitro diagnostics CAGR 12%

2017 preliminary figures

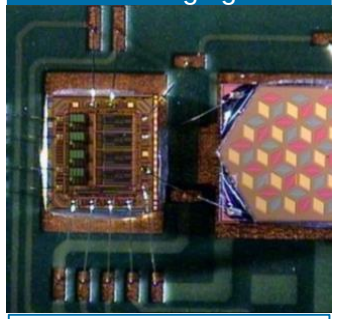
Sales:	>259 Mio €	(3 year CAGR >10%)
EBIT:	>50 Mio €	(EBIT Margin >19%)

Broad Photonics Technology Base

Digital Imaging

- System design
- Sensor specification
- Electronics development
- Software development
- Image processing / HW SW integration
- Production
- Qualification & test

Optoelectronics Assembly & Packaging

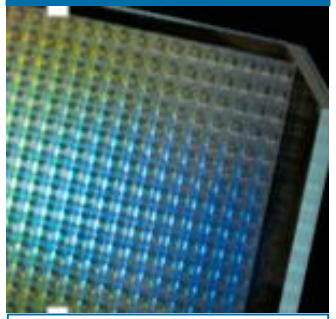


- Specification & development
- Wafer processing
- Wire bonding & chip bonding
- Micro technology (optics, filters)
- Encapsulation
- Functional tests

Optics

- Classical optics (up to 1000 mm)
- Plane, spherical and cylindrical optics
- Asphere technology
- Coating EUV to IR
- Components assembly – ultra clean area

Microoptics



- Diffractive & refractive optical elements
- Gratings & digital filters
- Computer generated holograms
- Hybrid microoptics
- Sensors

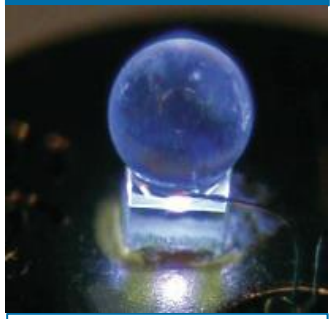
High precision polymer optics

- Optics & system design
- Tooling
- Ultra precision technology
- Optical component production
  - Injection molding, UPT
- Coating
- Assembly

Laser & Laser Systems

- Specification & development
- Semicond. epitaxy
- Single emitter & stacks
- Laser modules
- Fiber coupling
- Electronics
- Laser system integration
- Application & test

Optoelectronic Components & Systems

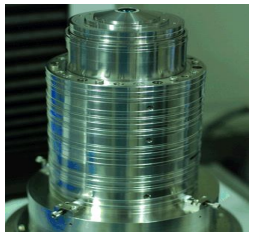
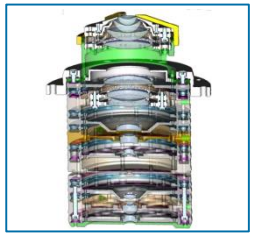
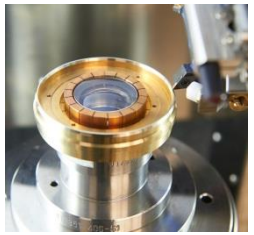


- Specification & development
- Semiconductor epitaxy
- LED & PD components
- Modules
- Final products
- Electronics & control

Jenoptik´s unique offering to growing markets

A holistic solution provider with key technology assets

From idea to solution


Requirement Analysis → Detailed Specification → Design & Development → Component Manufacture → System Integration → Qualification & Test → Service

Key assets in component and process technology

Enabling innovative products in Semiconductor Manufacturing, Optical Communications and Biophotonics

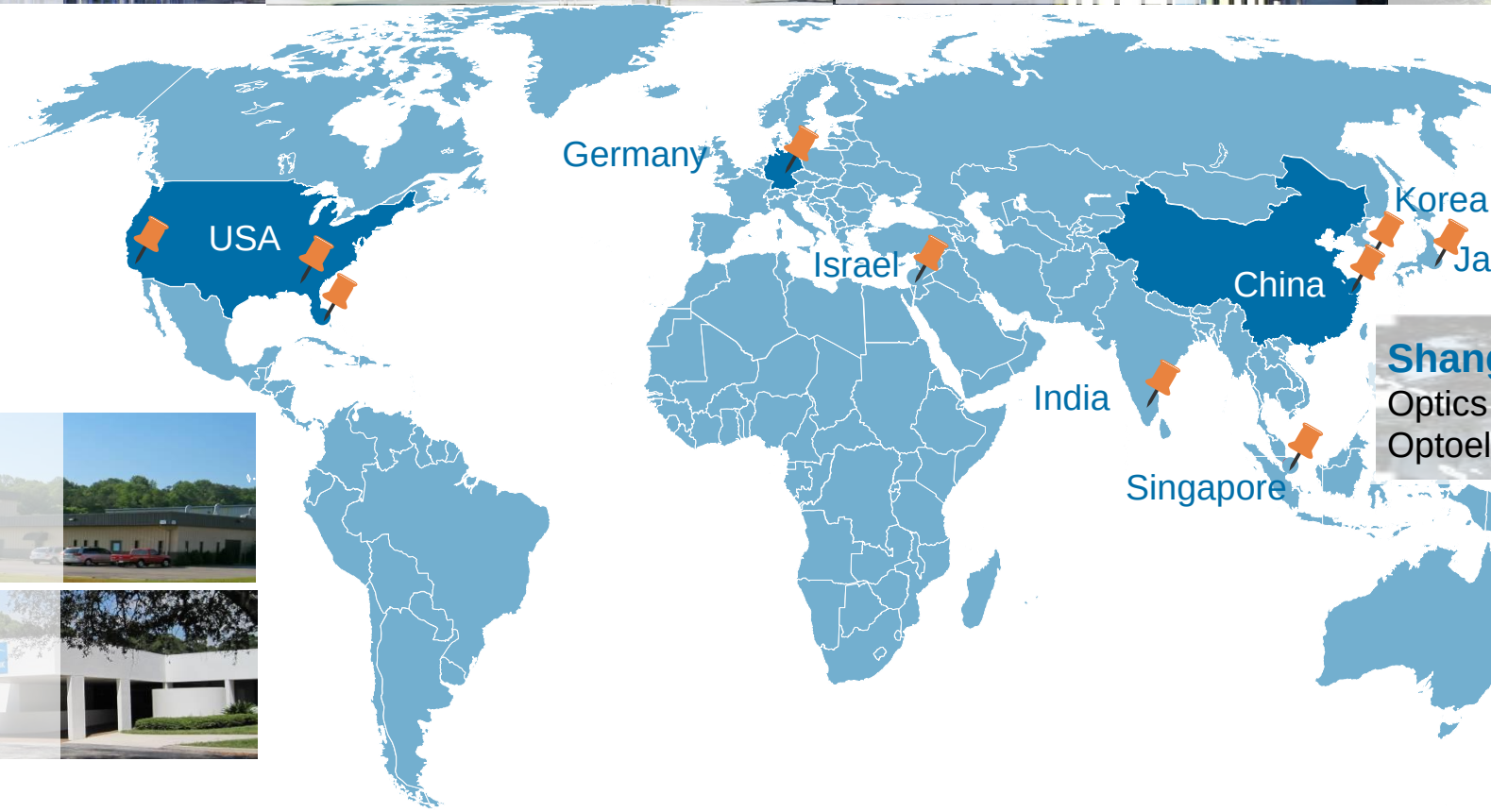
Optics and Life Science Segment
Supporting global markets

Jena
Optics
Microoptics
Optoelectronics

Triptis
Polymer Optics
Electronic Packaging

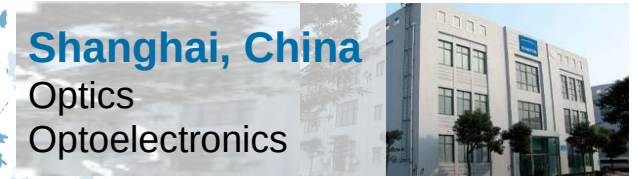
Berlin
Optoelectronics

Dresden
Microoptics
Optoelectronics



Jupiter, FL
Optics
Optoelectronics

Huntsville, AL
Microoptics



Shanghai, China
Optics
Optoelectronics

Strategic Building Blocks

Customer Proximity

The Jenoptik Silicon Valley Application Center offers convenient access to our wide range of technological know-how, customized systems engineering and application solutions experience.

Turn key solution offering

Our turn key solution enables platform customers to bring their next generation product to the market. By integrating our competences in optics, electronics hardware and software from design to serial production, we are able to realise their vision.

Platform offering

Jenoptik's new solution "SYIONS", a miniaturized modular diagnostic imaging platform, allows users to quickly and efficiently generate all types of image data from in-vitro diagnostics devices for use in scientific and clinical settings. SYIONS enables the quick and cost-effective implementation of applications in the areas of live cell imaging, flow cytometry and molecular diagnostics.

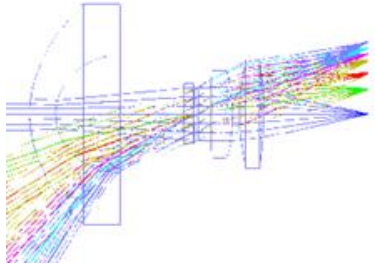
Aspiring to deliver Outstanding Value

Business Partner of Choice

- Proactively solve our customers´ problems
  - Understand customer application
  - Technological superior competence in optics and imaging
- Be the partner from the concept phase to serial production
- Flexible and fast, to help customers be competitive in their markets

Attractive Business Model

- OEM approach is a great way to serve a variety of growth markets
- Serve growth markets throughout cycles
- Leveraging our strengths in different industries
- Working with market leaders
- Highly efficient key account sales model






03

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Our new OEM-partnering business — Dr. Ralf Kuschnereit

3.2
Automotive division – our new engineering business — **Volkmar Hauser**
How we transform our Automotive division into an engineering business focusing as a solution provider on smart manufacturing and process automation

3.3
Our new public safety business — Kevin Chevis

3.4
Our new mechatronic business — Dr. Stefan Stenzel

Jenoptik Capital Market Day 2018

Division Automotive – Transformation to a complete solution provider for the smart factory

Volkmar Hauser | Feb 8th 2018

Jenoptik Automotive

We ensure efficient & environmental friendly automobility

Picture Source: Tesla (JO AM LP is a supplier of Tesla)

How do we generate customer value?

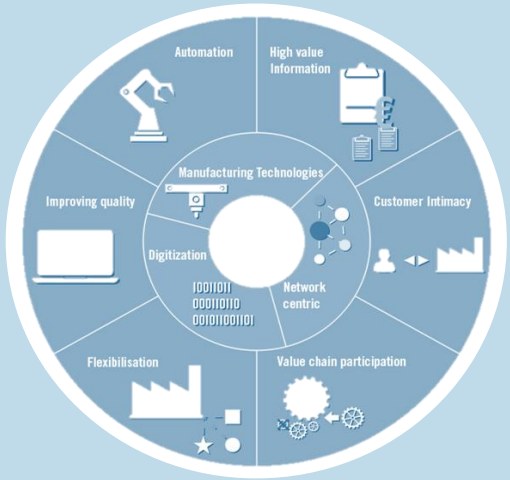
- We enable for our customers enhanced production processes and product quality in their Smart Factory by our solutions and services
- Leading global provider of high-precision, automated measurement and laser processing solutions for the automotive industry
- We ensure customer proximity and success within our core markets by local presence alongside the complete value chain

Jenoptik Automotive
Megatrends driving our business

CO_2 / NO_x reduction

- Improvement combustion engine
- E-mobility
- Lightweighting

Smart Factory



- Digitalization
- Automation
- Big Data

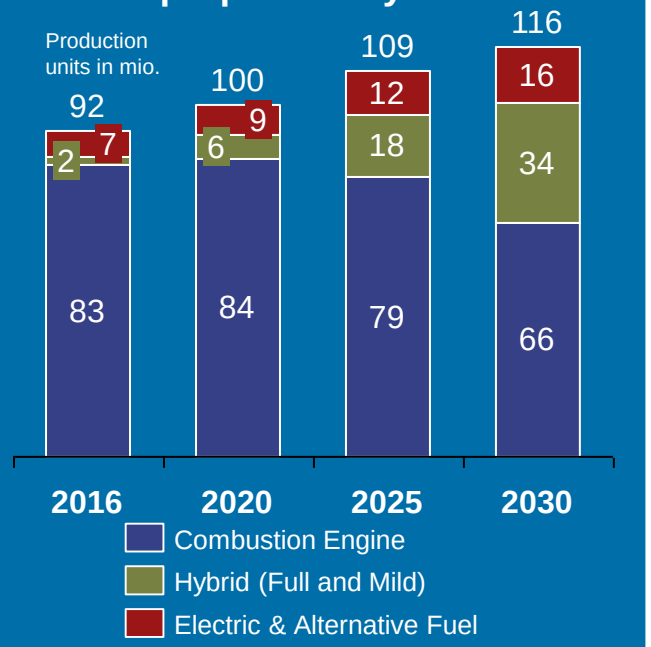
Growing importance Asia

- China as leading car market
- Leading position e-mobility
- Requests for local solutions

Change is on the way - but changes lead to opportunities!

Jenoptik Automotive
Derived opportunities for our business – Roadmap 2022

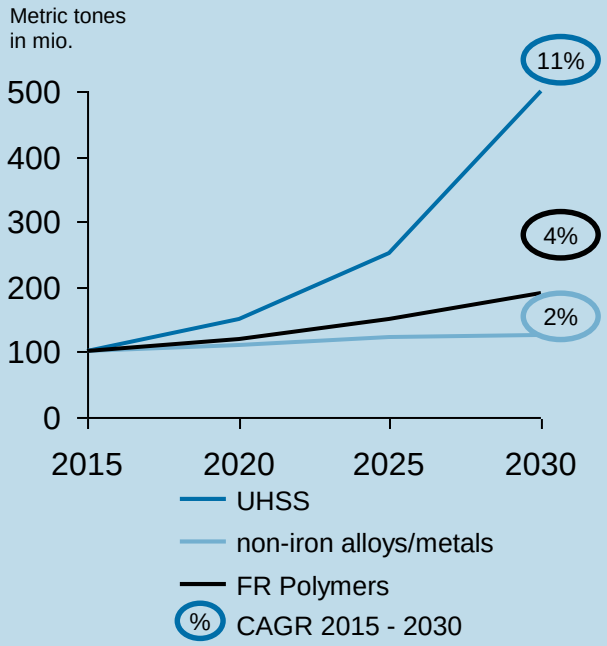
New propulsion systems



Key message:
% of combustion engine will stay at ~ 80%

Source: AT Kearney & IHS

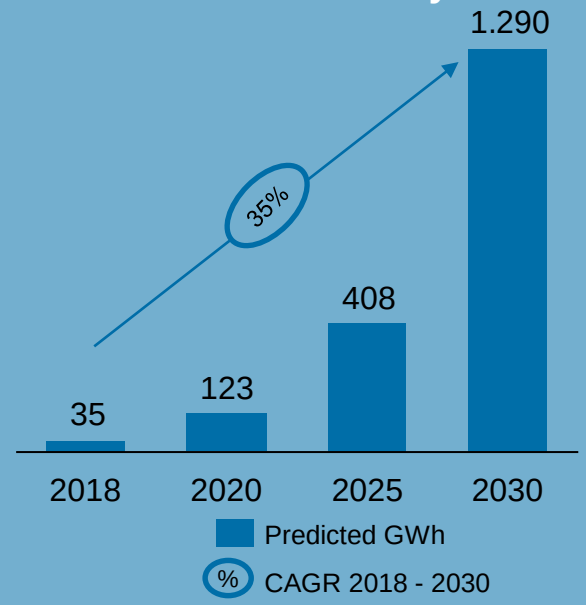
Lightweighting



Key message:
UHHS processing only possible by laser

Source: AT Kearney, Deutsche Bank, Just-Auto, BPI

Traction Battery



Key message:
Changes in E-mobility will support Metrology and Laser Processing business

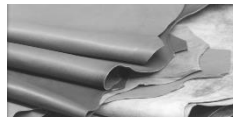
Source: PEM RWTH Aachen

Jenoptik Automotive
Strategic growth initiative Laser Processing – Roadmap 2022

New Applications

BIW

Exterior

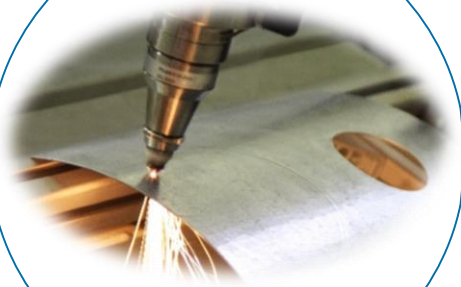


Sensitive materials (leather)

New Technology & Innovation

- Processing of new Lightweighting materials
- Ultra short puls laser processing

Core Competence



3D Laser Processing

Business Model

- Forward integration
- Service After Sales

Internationalization

- Engineering Solutions
- Automation

Jenoptik Automotive
Strategic growth initiative Metrology- Roadmap 2022

New Applications

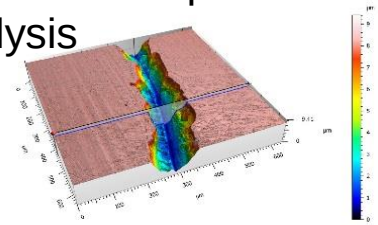
Hydraulic Parts

Break Systems

New Powertrain Systems*

New Technology & Innovation

- Optical Measurement & Optical Surface Inspections
- 3D - Analysis



Business Model

- Forward Integration
- Service After Sales

Internationalization

- Engineering Solutions
- Automation

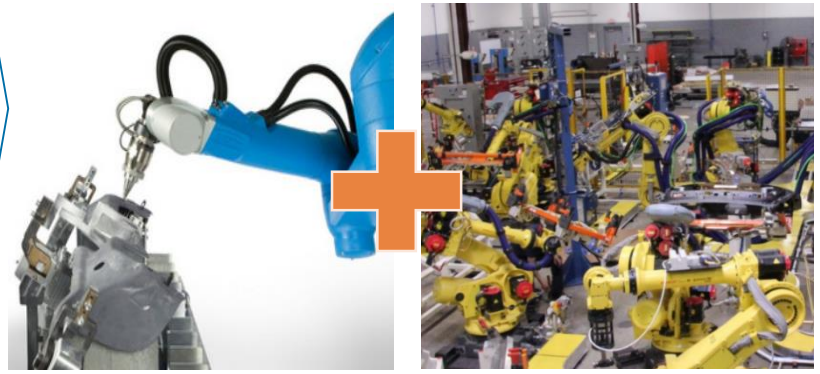
*Source Pictures: ZF

Jenoptik Automotive
Transformation of the Division – Roadmap 2022

Stand-alone system

JO Votan BIM Cutting

Engineering business & solution provider



JO Laser Module & Five Lakes Automation

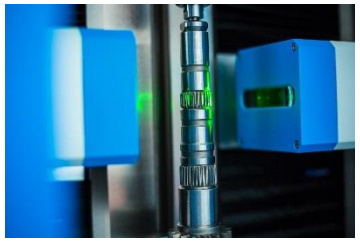
For the Smart Factory

Part of the IoT* & Service After Sales

Jenoptik Automotive

Strategic growth initiative After Sales Service – Roadmap 2022

Our Solutions



Trends

- Integration of the machines in the production line
- Automation
- Digitalization (I4.0)
- Predictive support

Customer Demands

- 24/7 within 4h reaction time
- Uptime & TCO*
- Global footprint
- Condition Based Monitoring

*TCO: Total Cost of Ownership

Excellent After Sales Service

03

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3.3
Our new public safety business — **Kevin Chevis**

How we build-out our Traffic Solutions business into a full public safety solution provider based on image-analysis, deep learning, and data management

3.4
Our new mechatronic business — Dr. Stefan Stenzel

Jenoptik Capital Market Day 2018

The transformation of Traffic Solutions to a new Public Safety Business

Kevin Chevis | Feb 8th 2018

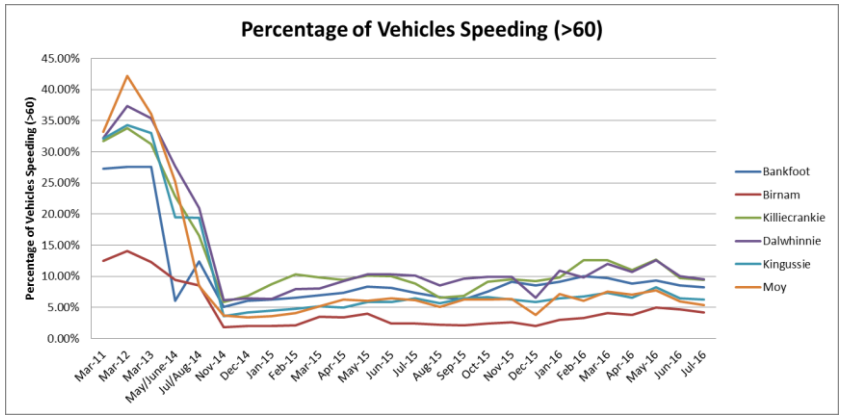
The transformation of Traffic Solutions to a new Public Safety Division

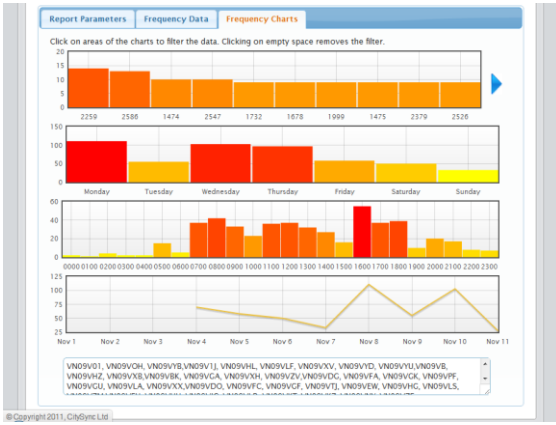
The journey so far…..

Traditional	New in 2014	New in 2017
Traffic Law Enforcement	**Acquisition of Vysionics ITS Ltd**	**Acquisition of ESSA**
– Global reach	– Access to UK market	– Police intelligence systems
– Clear market segmentation	– VECTOR intelligent camera	– Mobile Police ANPR
– Spot speed enforcement	– P2P enforcement	– Smart phone/tablet apps
– Red Light enforcement	– Police ANPR law enforcement	– New ways to ‘profile’ vehicles
– Offence processing	– New developments	– Integrated operational systems
– Traffic service provision		
Equipment supplier	Extended portfolio and markets	Solutions/systems provider
	Reduction in dependence on traditional products and markets	Moving up the value chain

The transformation of Traffic Solutions to a new Public Safety Division

Understanding what we actually do…..





- Calm traffic at dangerous locations
- **Reduce the number of traffic collisions where speed is the major contributing factor**
- Reduce the number of killed or seriously injured on the roads

- **Improve journey time reliability**
- Reduce the demand on emergency rescue and hospital critical care services

- Improve Police Officer efficiency
- Reduce vehicle emissions through smoother driving
- **Improve the use of existing roads infrastructure, through the cost effective implementation of technology**

- **Enable intelligence lead policing**
- Link vehicles with people, events, locations and crimes
- Track vehicles and convoys of vehicles
- Integrate ANPR data with other Police systems

SAVING LIVES

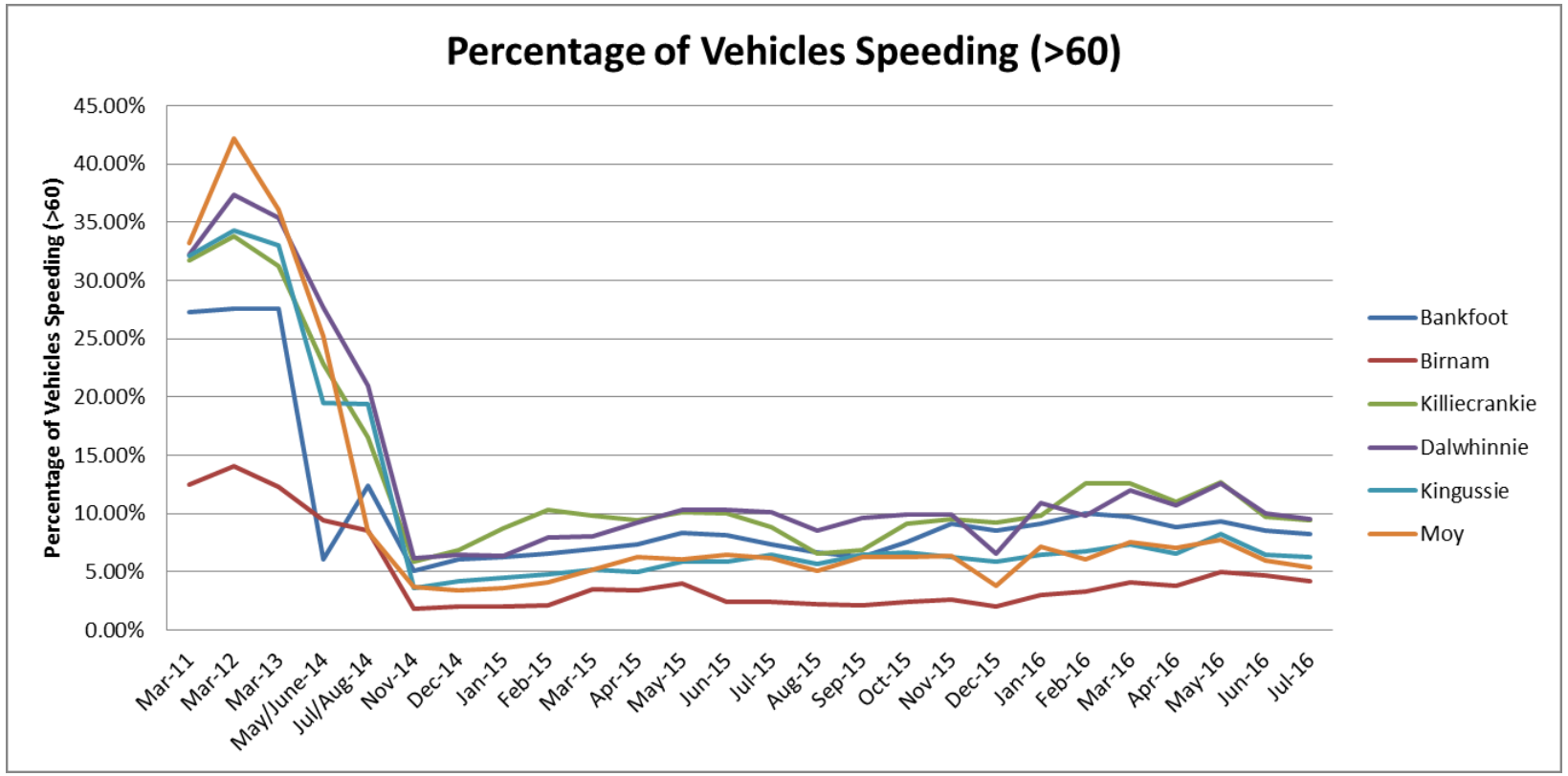
Fixed Point to Point (P2P) speed enforcement

Understanding what we actually do…..

- A9 in Scotland – Europe's longest enforcement project
- 220km of average speed enforcement
- Single and dual carriageway sections
- Runs through a National Park

Fixed Point to Point (P2P) speed enforcement

Understanding what we actually do…..

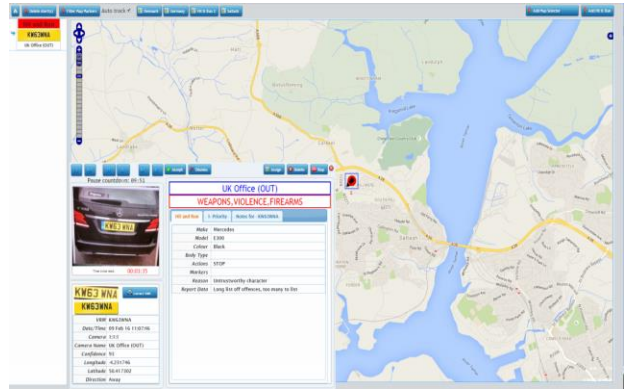


The outcomes

- Fatalities reduced by 33%
- Killed & seriously injured reduced by 62%
- All injury casualties reduced by 50%
- 1 in 10 exceeding limit - (prior 1 in 3)
- 1 in 250 10mph above - (prior 1 in 10)
- Delay incidents reduced by 43%
- Improved journey reliability
- > 5% increase in traffic

The transformation of Traffic Solutions to a new Public Safety Division

The technology to underpin this strategy…..



ANPR technology

– algorithms to read number plates in all conditions, at speed and in countries worldwide

Image processing

– To read traffic signals

Deep Learning

– To distinguish a car from a lorry
– To see if a seat belt is being worn
– To see if the driver is using a mobile phone
– To detect illegal vehicle turns

Big Data Processing

– To predict where crime might occur
– To highlight unusual vehicle activity or behavior
– To know where and when to intercept suspects

Innovation and the generation of IP

The transformation of Traffic Solutions to a new Public Safety Division

The complete new solution…..

Applications

Speed Enforcement

Police

Surveillance

Civil Enforcement

Others

Big Data processing:
Powerful analysis of data for multiple applications

BOF = **B**ack **OF**fice
Traffic control centres, Police control rooms etc.

ESSA

Data collection:
ANPR and other sensors - radar, laser, thermal cameras

The transformation of Traffic Solutions to a new Public Safety Division

The market ahead…..

International **Traffic Law Enforcement** market forecast growth **6% CAGR** 2015-2020 to $445M per annum

International **Police ANPR** market forecast growth **9.4% CAGR** 2015-2020 to $228M per annum

'Bridging the gap' between the ITS market for speed enforcement, and the Police Intelligence market, with a **multi functional platform**.

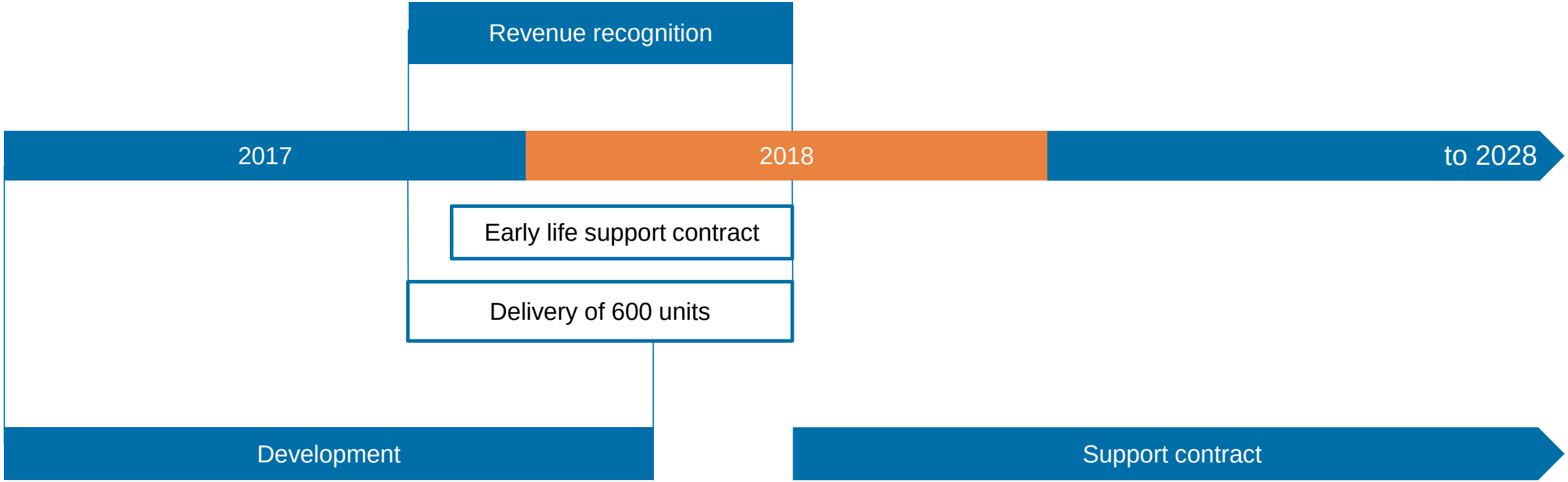
Traditional speed enforcement → Police ANPR

Converging products onto a single platform, with applications in markets around the world

Increased **threat** of global terrorism and organized crime is **driving expenditure**

Maximizing client investment, **reducing** roadside equipment

Toll Collect project
Progress to date



- 2017 - difficult start, but we did recognise some revenue
- 200 units supplied to date
- 2018 - positive revenue and EBIT impact

The transformation of Traffic Solutions to a new Public Safety Division

The journey ahead…..

- We will continue to invest in our ability to generate IP
- We will further develop service provision
- We will continue to exploit Jenoptik global reach
- We will further engage with our clients to improve roads, journeys and communities

We take seriously the role we have in assisting our clients to continually improve public safety throughout the world

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How our electro-mechanical businesses are going to use a dedicated brand to serve its customers in the aviation industry and in the security space

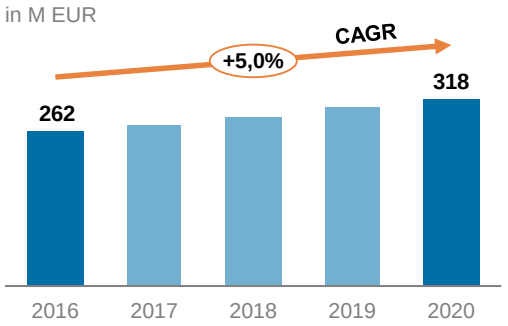
Jenoptik Capital Market Day 2018
Defense & Civil Systems

Dr. Stefan Stenzel | Feb 8th 2018

DCS Markets
Favorable trends in stable markets

Market for civil aviation systems

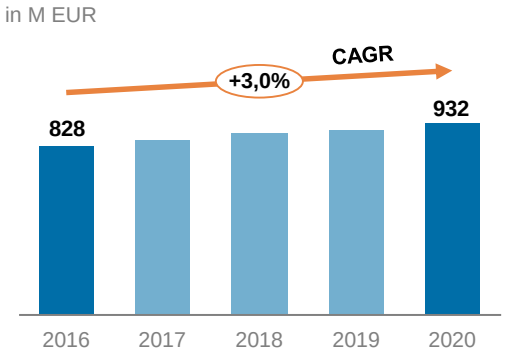
Market volumes



Latest trends

- Limited new business opportunities as very few new aircraft will be launched in the next decade
- But, growth potential for innovative products with proven maturity as well as for lightweight and energy efficient products
- Also, today´s duopoly in rescue hoist market offers additional business opportunities

Market for military energy systems



- Increasing demand for maximum MTBF(operational readiness)
- Customer focus on reduction of energy consumption and integrated, smart energy systems for mobile platforms (tanks, IFV, …)
- Additional business opportunity for high voltage energy systems in 8 to 10 years due to slow laser weapon introduction
- Many modernization activities for tank installed base:
  - Leopard I + II, Germany, Poland, Finland, Denmark, Greece
  - Challenger II, UK
  - Merkava IV, Israel

IFV= Infantry Fighting Vehicle
MTBF= Mean Time Between Failure

DCS Strategy
Innovative products meet future market demands

DCS Strategy

DCS will

- Become a **strategic supplier in the civil aviation market for heater systems and rescue hoists** for at least two aircraft and helicopter OEMs, respectively
- Become a **leading supplier of energy systems for military platforms** to improve their mobility, firing power, precision and fuel consumption
- Implement **platform strategies for COTS/ MOTS[1] products** with short delivery times, low customization costs, value adding features and low total cost of ownership
- **Actively shape the requirements for the end-user product 3 to 5 years before series production**: through strategic partnerships with OEMs/ system integrators
- **Supply several system integrators with multiple platforms** to balance order entry volatility
- **Guarantee supply & overhaul capability of 30+ years**

1: Commercial-off-the-Shelf/ Military-off-the-Shelf

New Commercial-off-the-Shelf Products (examples)

ERH — **Product launch: Q1/ 2019**

FPH — **Product launch: Q4/ 2018**

New Military-off-the-Shelf Products (examples)

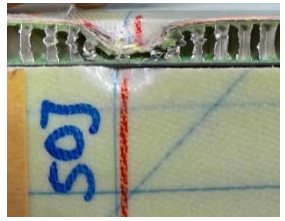
SAM 600 Amp Generator — **Product launch: Q3/ 2018**

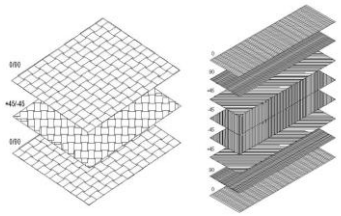
Patriot Hybrid — **Product launch: Q2/ 2018**

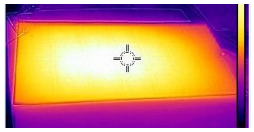
ERH= Electrical Rescue Hoist
FPH= Floor Panel Heated

Division Defense & Civil Systems
BU Aviation – Floor panel heated

Floor panel heated for airframer…







Airbus A320

Boeing 737

Airbus A330

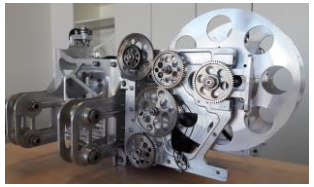
… with strong USPs

Customer value:

- Mechanical robustness (especially edge and surface areas)
- Functional safety without fire or smoke emission due to positive temperature coefficient technology
- Lower weight and price than current solutions
- Uniform heat distribution

Division Defense & Civil Systems
BU Aviation – Electrical SkyHoist 800

Electrical rescue hoist with innovative technology…



Airbus H145

Sikorsky S-92

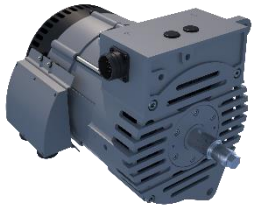
Leonardo AW-139

… and strong USPs

Customer value:

- Reduction of life cycle costs because of lower initial purchase price and reduced maintenance costs (Modular service concept)
- Capstan technology: jerk-free movement and increased operational life
- Longer hoist-cable
- 30% more load capacity (350 kg)
- Remote control operation

New air-cooled 600 A generator provides large quantity opportunities …



FMTV

630 units. p.a.
Q4 2018

JLTV

2500 units p.a.
From 2022

HMMWV

1000 units. p.a.
From 2021

FMTV = Family of Medium Tactical Vehicles
JLTV = Joint Light Tactical Vehicle
HMMWV = High Mobility Multipurpose Wheeled Vehicle

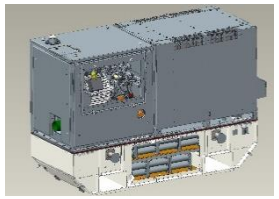
… and strong USPs

Customer value:

- High reliability due to MTBF of 6000h
- High performance in engine idle speed
- Compact design
- High efficiency: low power loss

Division Defense & Civil Systems
BU Power Systems – Patriot Hybrid

Air defense system– worldwide in use…



Patriot Launcher

Patriot Radar

… with strong USPs

Customer value:

- Enhancement of „Operational Readiness“
- Reduction of life cycle costs by Considerable fuel savings (>50%) and mean time between failure (MTBF) 4 times better than competition
- Designed for global use, independent of local power supply
- Use of public grid power possible with integrated converter
- Optimized Human Machine Interface (HMI)
- Lower noise signature

A sharply focused DCS brand supports us in creating a stronger customer awareness for

- our competencies in power generation & energy management
- our track record of maximum reliability in aerospace & defense applications
- our commitment in 30+ years of guaranteed supply and overhaul

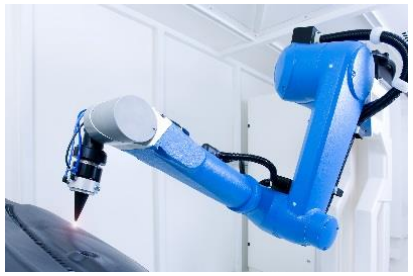
Bild: Jenoptik / Steirhochvier

04

4.1
The New JENOPTIK

Dr. Stefan Traeger

Our new structure starting 2019: Focused Divisions and Technology Synergies

	Photonic			Mechatronic
Division	**LIGHT & OPTICS** OEM-Business	**LIGHT & PRODUCTION** B2B-Business	**LIGHT & SAFETY** B2G-Business	**“New-DCS”** A member of Jenoptik Group
Characteristics	 – Design & Manufacturing **Business Partner for OEM customers** – Provides optical components, modules and systems for applications in the **Semiconductor Manufacturing Space, the Communication Segment and in Biophotonics**	 – **Engineering Business** offering products, services and solutions for industrial consumers – Focuses on **Smart Manufacturing and Process Automation** using primarily Optical and Photonic technologies	 – Provider of imaging-based solutions for **Public Safety** – Uses image and video analysis skills, deep learning technologies and data management **solutions** – Offers „**Soup to nuts“ services** for public customers around the globe	 – Member of Jenoptik Group which offers services and solutions under its **own brand**, which fits best to its specific commercial needs – Focuses on **electro-mechanical solutions** for partners in the **Aviation and Security Industry**
	Merger of Optical Systems and Healthcare & Industry divisions	Today‘s Automotive division	Today‘s Traffic Solutions division	Carve-out from DCS division (Aviation, Power Systems, Energy&Drive)

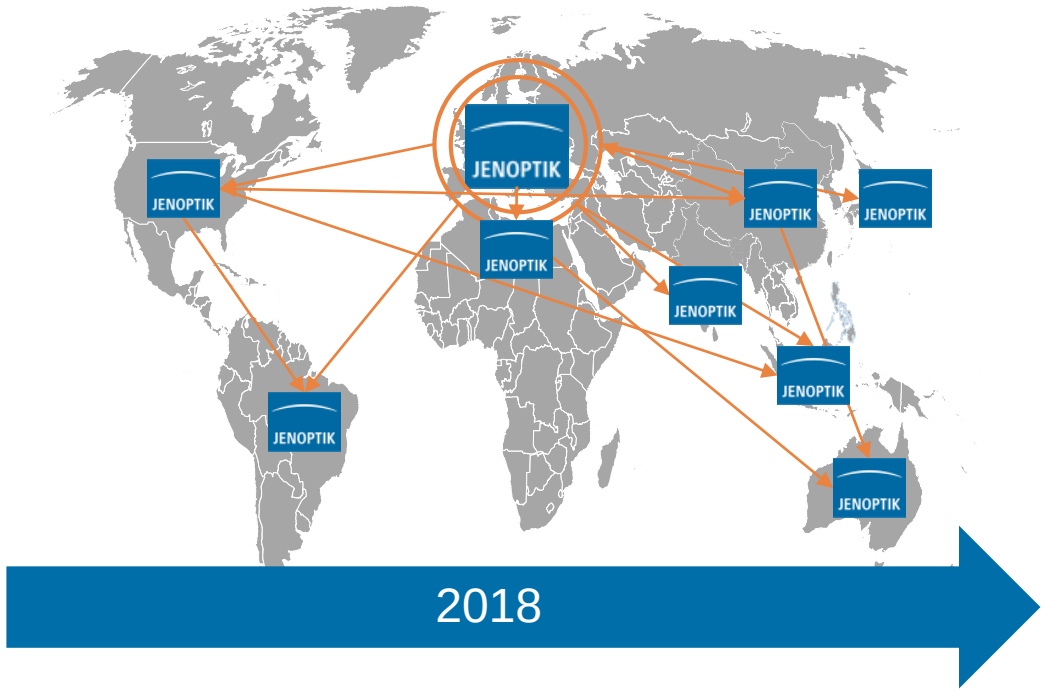
We will prepare the move in 2018 and start reporting in the new structure in 2019.

Our priorities for 2018

- **ESTABLISH A NEW BUSINESS STRUCTURE**
- **REORGANIZE OUR BUSINESS IN ASIA**
- **LAUNCH A NEW BRAND FOR OUR MECHATRONIC BUSINESS**

Our 2018 guidance

Enter in a new period of accelerated growth



Group financial guidance for 2018*

– We expect revenue to be in a range between 790 and 810 million euros.

– We expect an EBIT margin between 10.5 and 11.0 percent.

*This presupposes that political and economic conditions do not worsen.

Our mid-term guidance

Group 5-year targets: accelerated growth and margin Expansion

Sales growth	We expect mid- to high-single digit sales growth (CAGR) for the group in the 5-year horizon.
Margin increase	By 2022, we expect to achieve an EBITDA margin for the Group of around 16 percent.

Time for discussion and closing remarks

Thank you for your attention!