



THE NEW COHERENT

Trigon Laser Seminar, 27th of November 2017
Ralf Gross, Coherent (Deutschland) GmbH

FORWARD-LOOKING STATEMENTS & NON-GAAP MEASUREMENT

Forward-Looking Statements

The statements in this presentation that relate to guidance, projections, future plans, business opportunities, estimates, events or performance are forward-looking statements that involve risks and uncertainties, including risks associated with business and economic conditions, customer and/or supplier contract cancellations, manufacturing risks, competitive factors, successful introductions of new products, uncertainties pertaining to customer orders, demand for products and services, growth and development of markets for the Company's products and services, and other risks identified in our filings made with the Securities and Exchange Commission, including, most recently, our Form 10-K for the year ended October 1, 2016. Actual results, events and performance may differ materially. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. The Company undertakes no obligation to release publicly the results of any revisions to these forward-looking statements that may be made to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events. Readers are encouraged to refer to the risk disclosures described in the Company's Form 10-K for the fiscal year ended October 1, 2016, our most recent Form 10-Q and subsequent reports and 8-K's, as applicable.

Non-GAAP Measurement

The Company's statements regarding its historical pro forma gross margin, operating margin and pro forma EPS results are non-GAAP financial measures. Historical pro forma gross margin, operating margin and pro forma EPS exclude those items set forth on the applicable slide and you should refer to those slides and the reconciliation for further information.

The Company neither updates nor confirms any guidance regarding the future operating results of the Company which may have been given prior to this presentation.

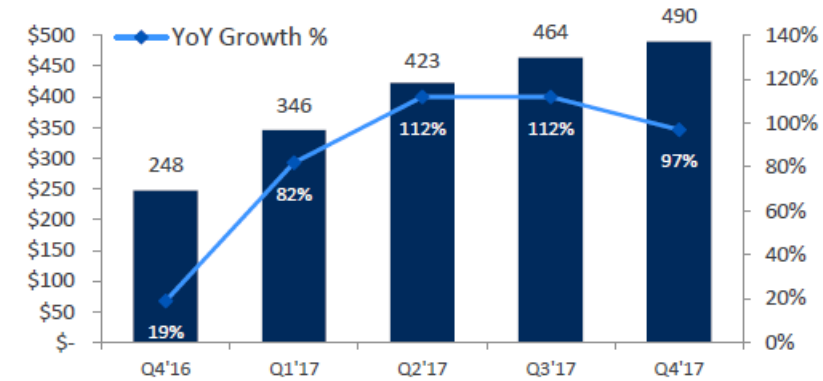
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COHERENT - THE PHOTONICS COMPANY

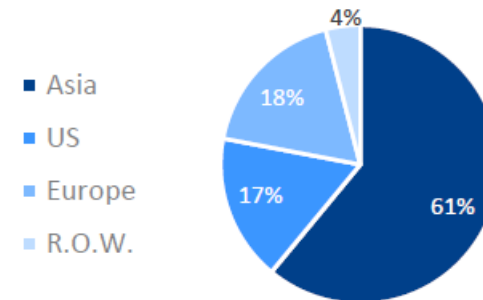
Key Company Facts

- Industry leading provider of photonic solutions
- Founded in 1966
- LTM Sales \$1,723M
 - Significant revenue growth momentum
 - Sales 17% U.S. and 83% International
- Strong cash flow, balance sheet
- ~5,200 Employees

Growth Momentum - Revenue (\$M)

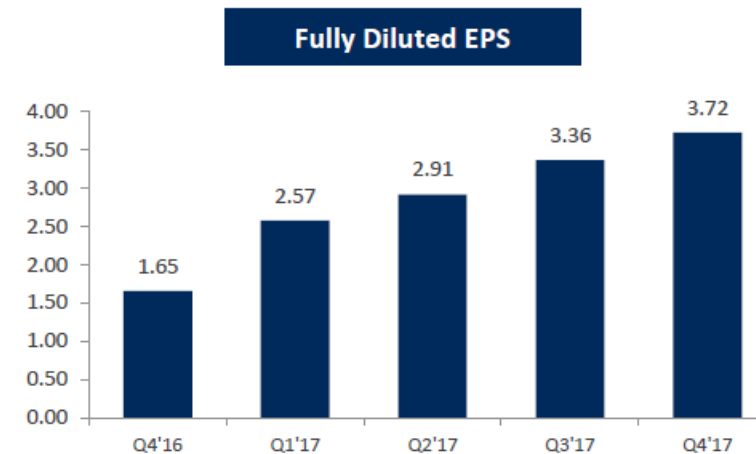
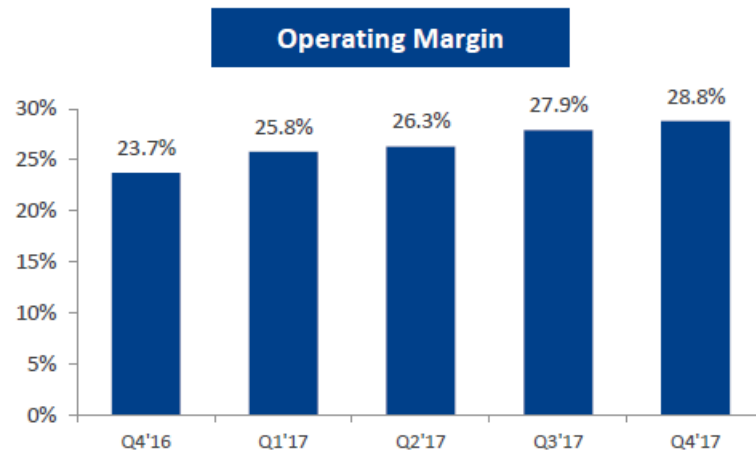
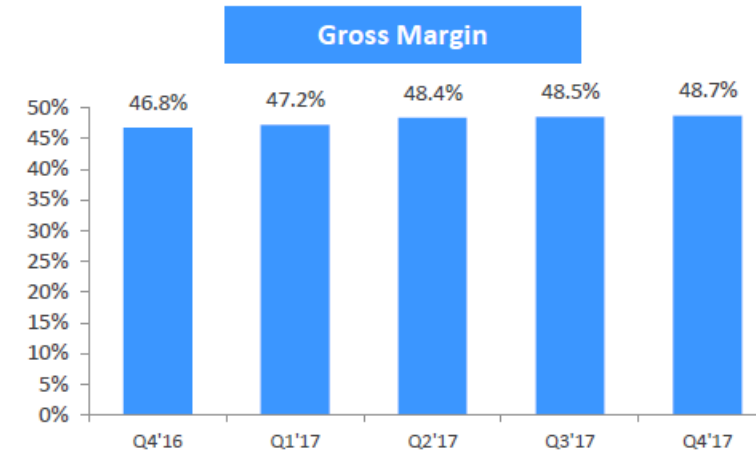
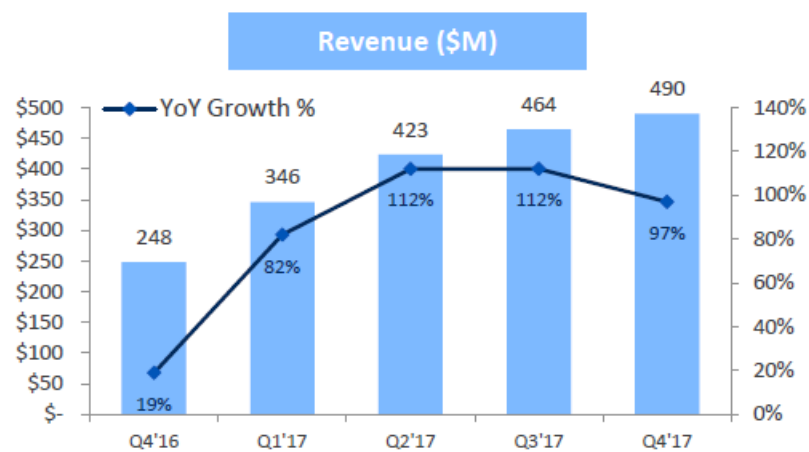


Sales by Geo – LTM



Note: Photonics is the Merger of Lasers, Optics and Electronics
Source: Company management as of 08/01/2017

FINANCIAL PERFORMANCE (NON-GAAP)



Note: Gross Margin, Operating Margin and EPS exclude stock related compensation charges, intangibles amortization and exceptional items such as acquisition expenses, restructuring costs, impairments and the related tax effects.



COHERENT®

rofin

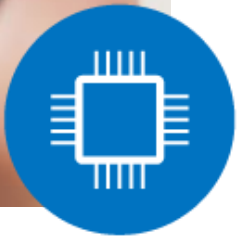
LEADING AND INNOVATING TOGETHER

- 1966 Foundation of COHERENT in Palo Alto, USA
- 1975 Foundation of ROFIN-SINAR Laser in Hamburg, Germany
- 2016 Merger of ROFIN-SINAR Technologies with and into the COHERENT family

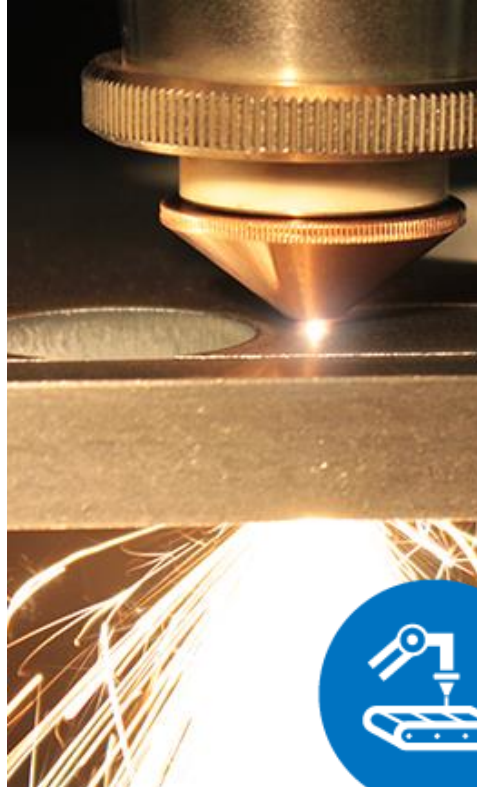
SERVING OUR CUSTOMERS WITH THE BROADEST PORTFOLIO OF PHOTONICS SOLUTIONS



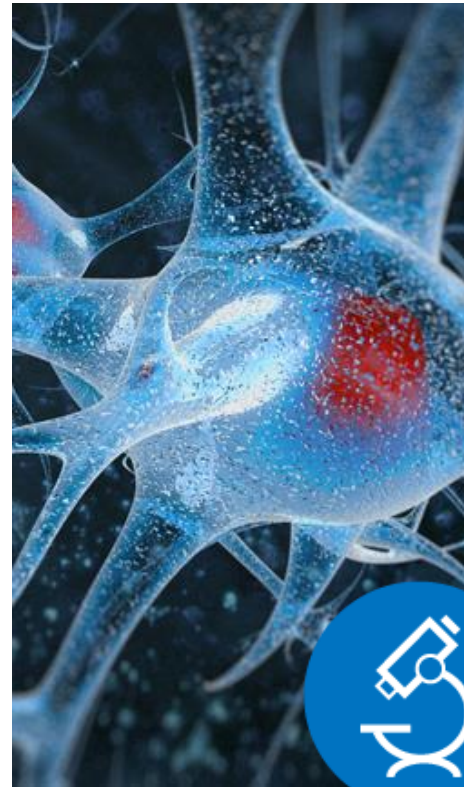
CORE MARKETS



Microelectronics



Materials Processing



**OEM Components &
Instrumentation**



**Scientific Research
& Government Programs**

Growth vs. Market



Microelectronics

Consumer Goods
Displays

1

SAM Position

Materials Processing

Automotive,
Machine Tool,
Metal Cutting/Welding,
Medical Device

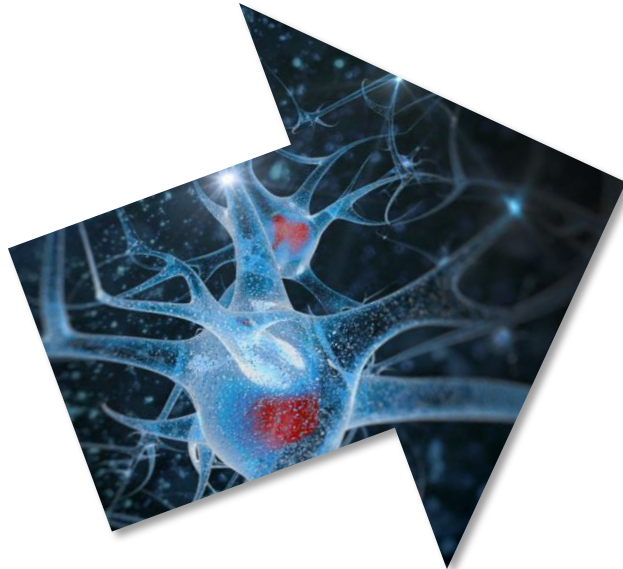
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OEM Components & Instrumentation

Bioinstrumentation
Medical

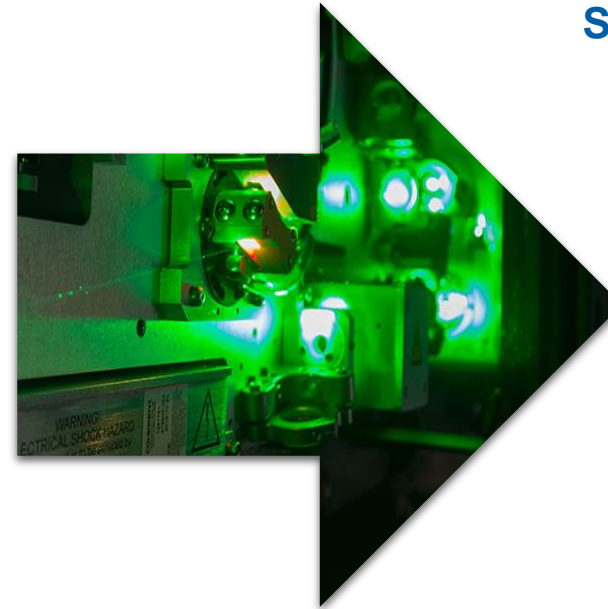
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Scientific Research & Gov. Programs

Spectroscopy
Advanced Imaging

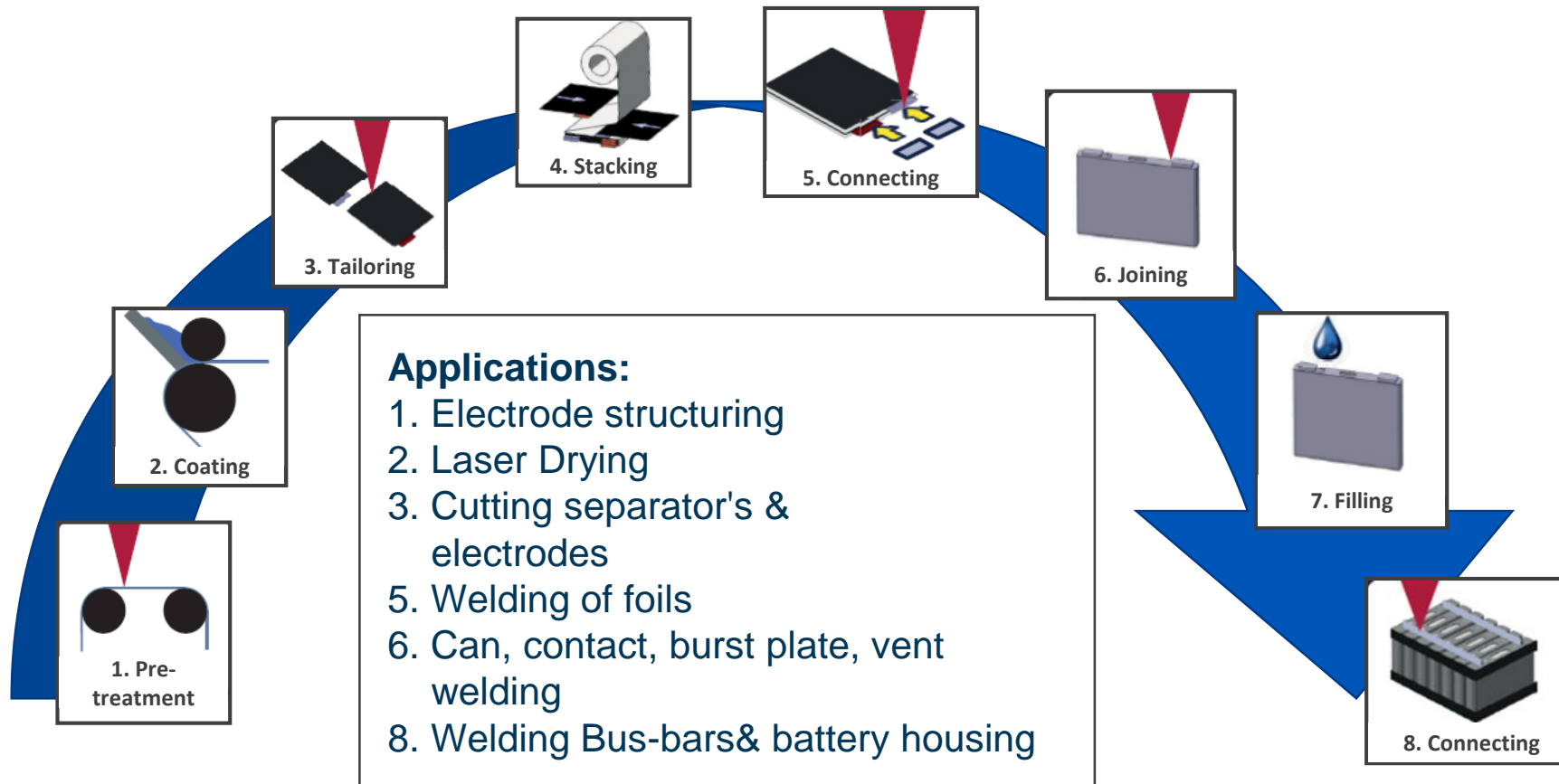
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GROWTH CATALYSTS

- Microelectronics
 - OLED adoption in handsets, mobile computing, automotive, TVs, general signage
 - Smaller geometries in silicon
- Materials Processing
 - Continued laser adoption for Industrial applications
- OEM Instrumentation
 - Eye care; vision correction, cataracts for aging population
 - Dental: laser advantages vs mechanical devices
 - Aesthetic and Dermatology, Cytometry, Gene Sequencing
- Scientific Research
 - GDP +/- type of growth

EXAMPLE: LASER OPPORTUNITIES IN BATTERY MFG.



CUSTOMERS

EXCELLENCE



TECHNOLOGY



ENGINEERING



MANUFACTURING
AND OPERATIONS



PEOPLE



SYSTEMS



PRODUCTS

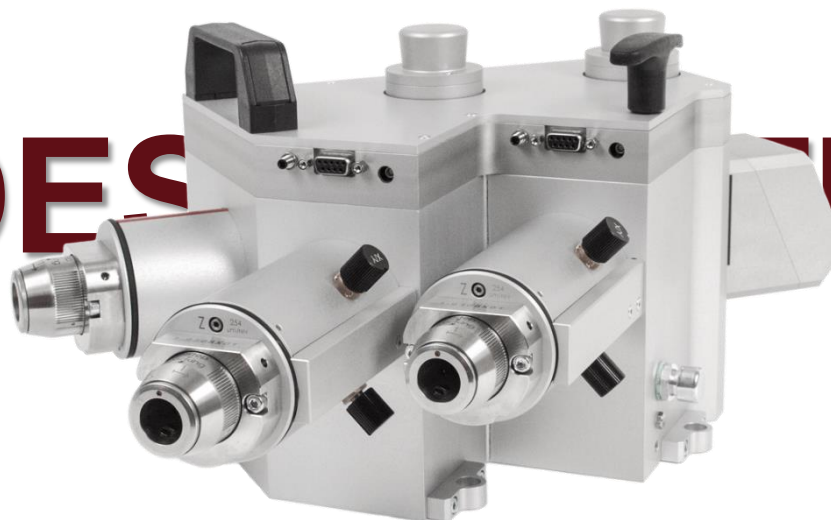
LEADERSHIP

BROADEST PORTFOLIO

COMPONENTS



ROADS FOLIO



COMPONENTS



SOURCE



COMPONENTS



SOURCES



COMPONENTS



SOURCES



TOOLS

COMPONENTS

CW SOLID-STATE

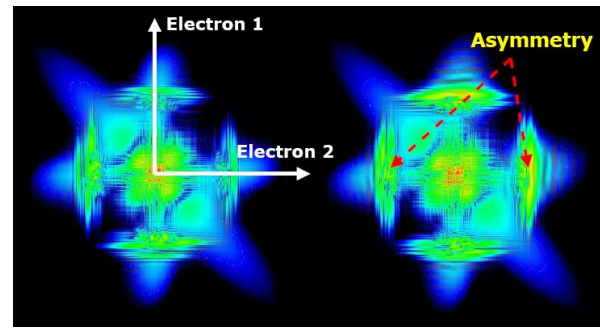
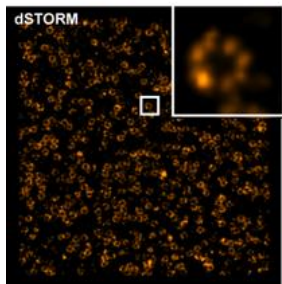
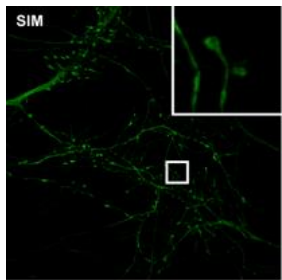
FEMTOSECOND

CW PICOSECOND

NANOSECOND

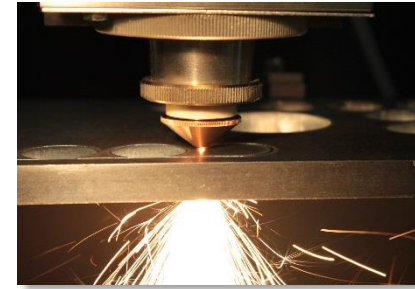
SOURCES
ATTOSECOND

TOOLS



COMPONENTS

KILOWATT



FEMTOSECOND

CW PICOSECOND

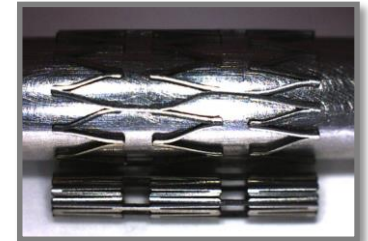
MILLIWATT

NANOSECOND

SOURCES

ATTOSECOND

WATT



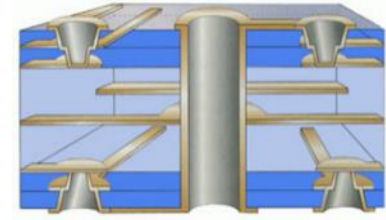
TOOLS

CW SOLID-STATE



COMPONENTS

KILOWATT



VISIBLE LIGHT

FAR INFRARED

FEMTOSECOND

CW

PICOSECOND

CW SOLID-STATE

INFRARED

MILLIWATT

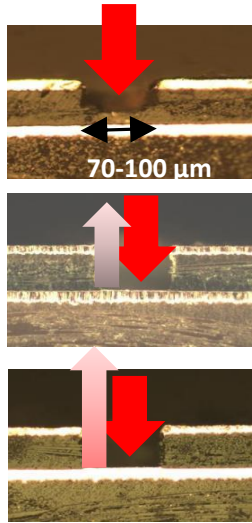
ULTRAVIOLET

SOURCES

NANOSECOND

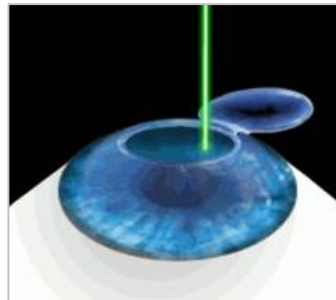
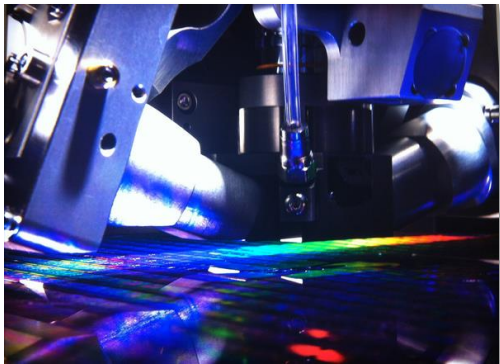
ATTOSECOND

WATT



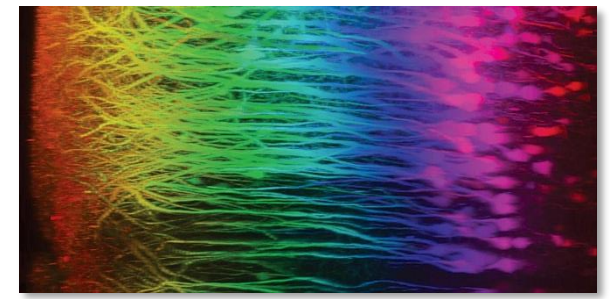
UV

TOOLS
VISIBLE



COMPONENTS

NANOJOULE
KILOWATT



CW SOLID-STATE
Joule
INFRARED

VISIBLE LIGHT

FEMTOSECOND

TH
IG
J

CW

FAR INFRARED
PICOSECOND

MILLIWATT
ULTRAVIOLET

SOURCES



NANOSECOND

ATTOSECOND

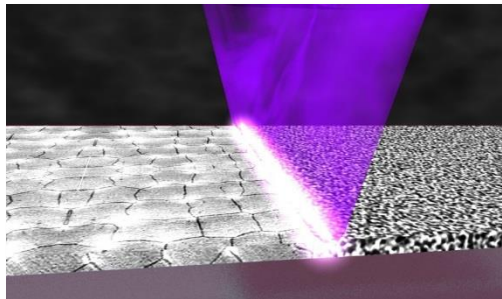
WATT

MICROJOULE

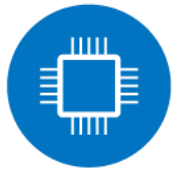
UV

KILOJOULE

TOOLS
VISIBLE



COHERENT KEY TECHNOLOGIES



MICROELECTRONICS



MATERIAL PROCESSING



OEM COMPONENTS AND INSTRUMENTATION



SCIENTIFIC RESEARCH AND GOVERNMENT PROGRAMS



EXPANDING OUR GLOBAL SERVICE AND SUPPORT TO ENHANCE THE CUSTOMER EXPERIENCE



20,000 Customers

160,000 Systems

30,000 Field Visits Annually

Service Team of over 550 People

Sales Team of over 300 People

Over 50 Sales & Service Locations



CUSTOMERS TOP PRIORITY

Drive us to be better every day

Drive us to innovate

Drive us to lead

CUSTOMER REFERENCES

Automotive & Sub-Supplier



Machine Tool



Semicon & Electronics



Packaging



Others



QUALITY CERTIFICATION



Majority manufacturing and repair sites within Coherent are **ISO 9001** certified and select sites have additional certifications



ISO 13485 - standard certification for manufacturing sites that sell to medical device manufacturers



ISO 14001 - certification for manufacturing sites formalizing the environmental initiative



ISO 17025 accreditation- for sites performing calibration of Coherent meters



OHSAS 18001 certification - sites satisfying safety regulations

CULTURE OF QUALITY

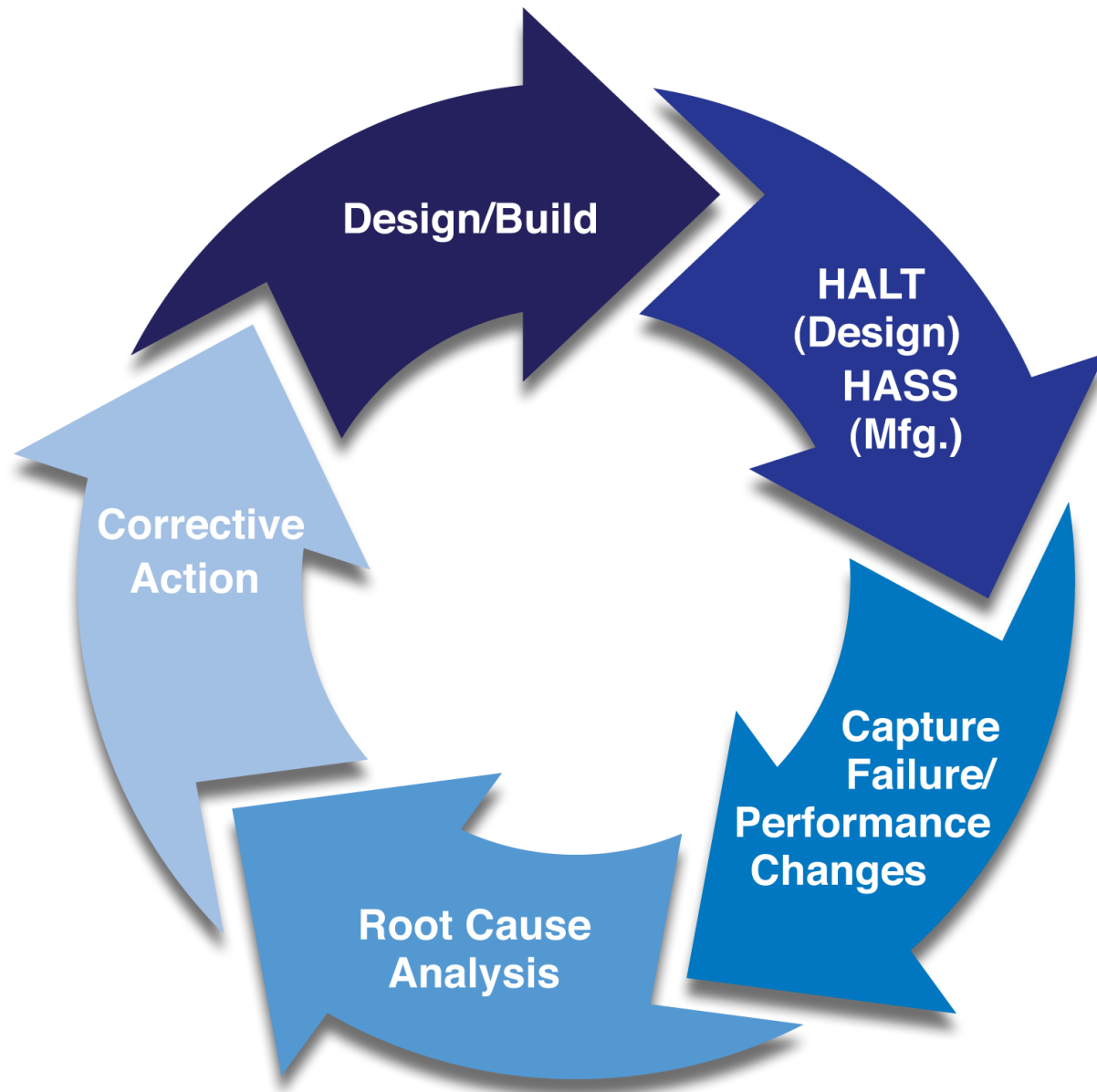


Internal Audit Program

- Corporate and Inter-Site Auditing
- Continuous Improvement beyond ISO 9001
- Sharing of Best Practices

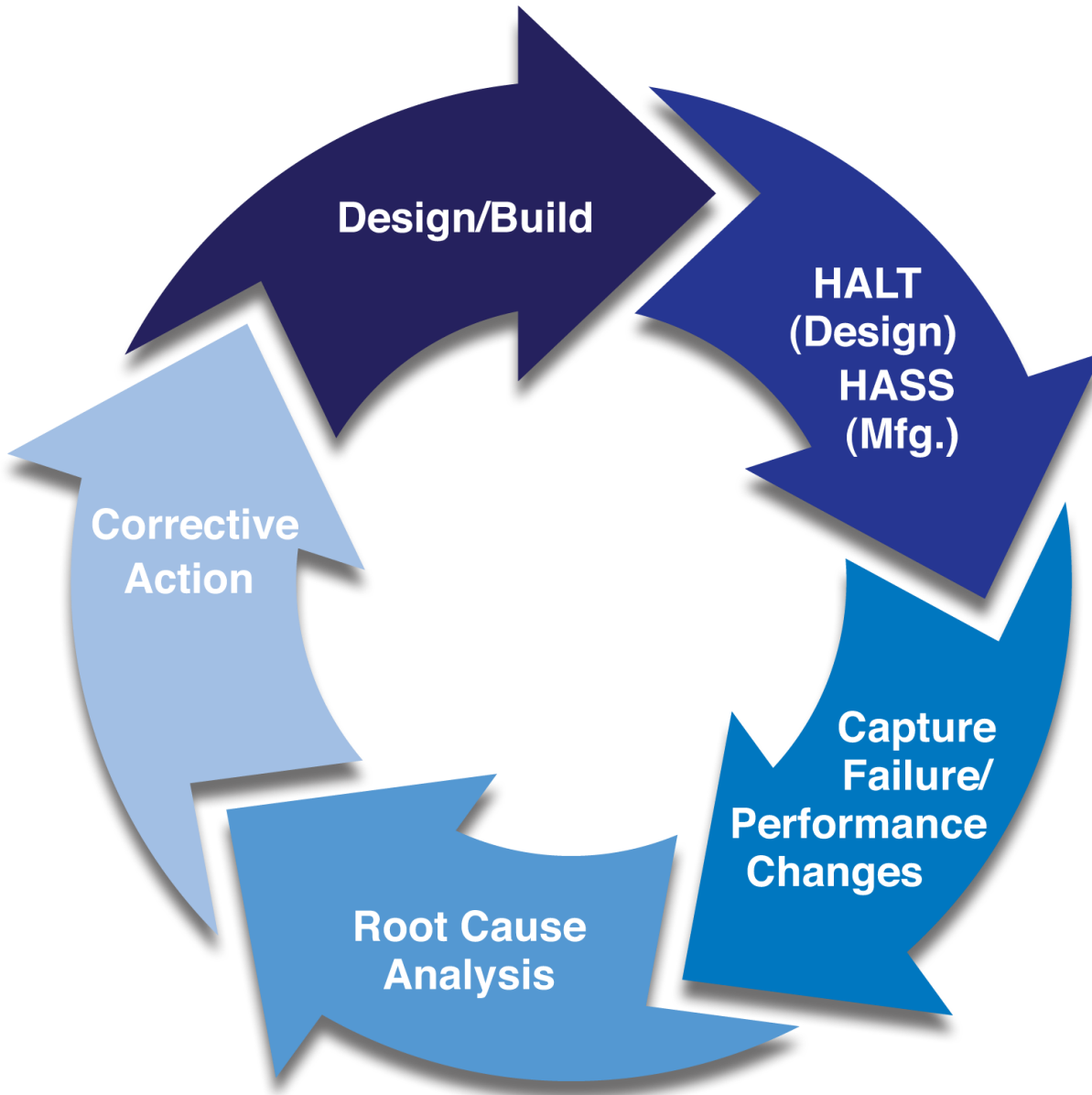
Quality Resources

- Corporate Quality Department for Strategy and Guidance
- Corporate Supply Chain for Supplier Development
- Dedicated Site Quality Personnel for Direct Design & Production Support



WATCH





Industrial Design & Testing

HALT

Highly Accelerated Life Testing protocol for the design phase

HASS

Highly Accelerated Stress Screening protocol for the manufacturing phase

WATCH

MANUFACTURING AND DEVELOPMENT LOCATIONS

USA

Santa Clara, CA
Sunnyvale, CA
Richmond, CA
Tucson, AZ
Wilsonville, OR
Plymouth, MI
East Granby, CT
Bloomfield, CT
Salem, NH
Deven, MA
Landing, NJ
E.Hanover, NJ
Orlando, FL

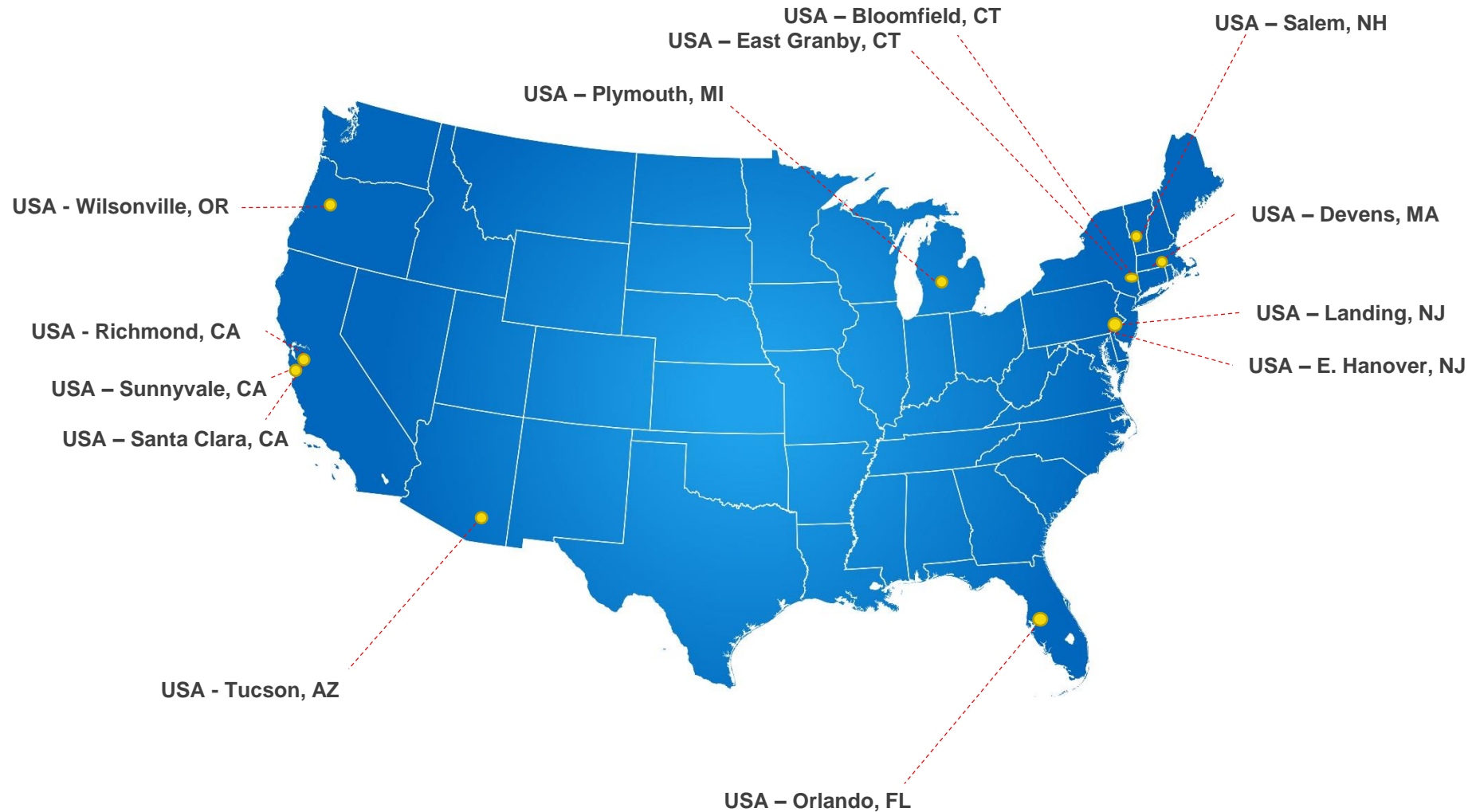
Europe

Belp, CH
Starnberg, DE
Freiburg, DE
Kaiserslautern, DE
Lubeck, DE
Gottingen, DE
Gilching, DE
Bergkirchen/Gunding, DE
Hamburg, DE
Overath, DE
Mainz, DE
Molndal, SW
Tampere, FI
Glasgow, UK

Asia

Malaysia
Singapore
Nanjing, CN
Osan, KR

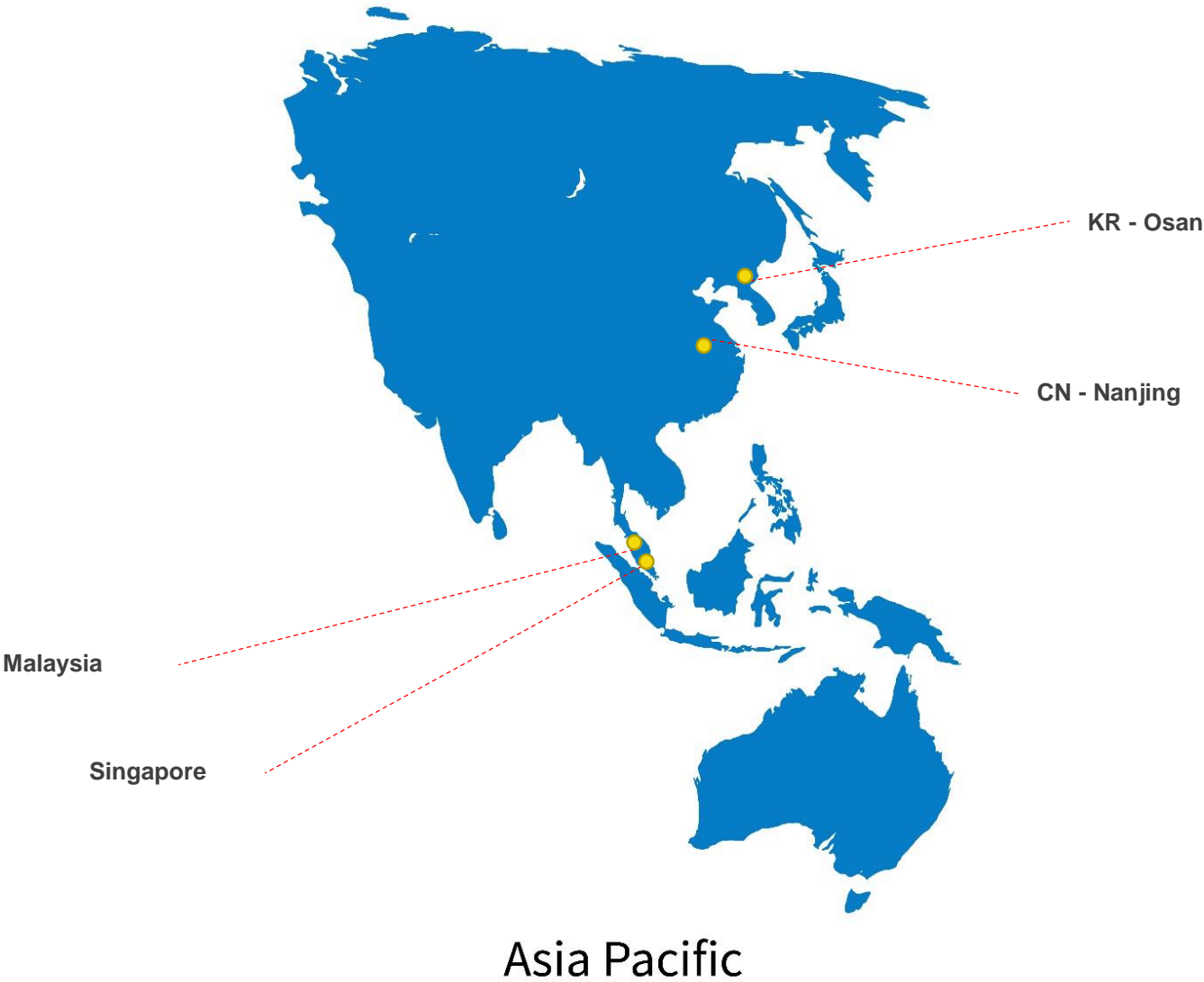
MANUFACTURING & DEVELOPMENT LOCATIONS IN USA



MANUFACTURING & DEVELOPMENT LOCATIONS IN EUROPE



MANUFACTURING & DEVELOPMENT LOCATIONS IN ASIA



CULTURE OF LEADERSHIP

Inclusion

Empowerment

Enablement

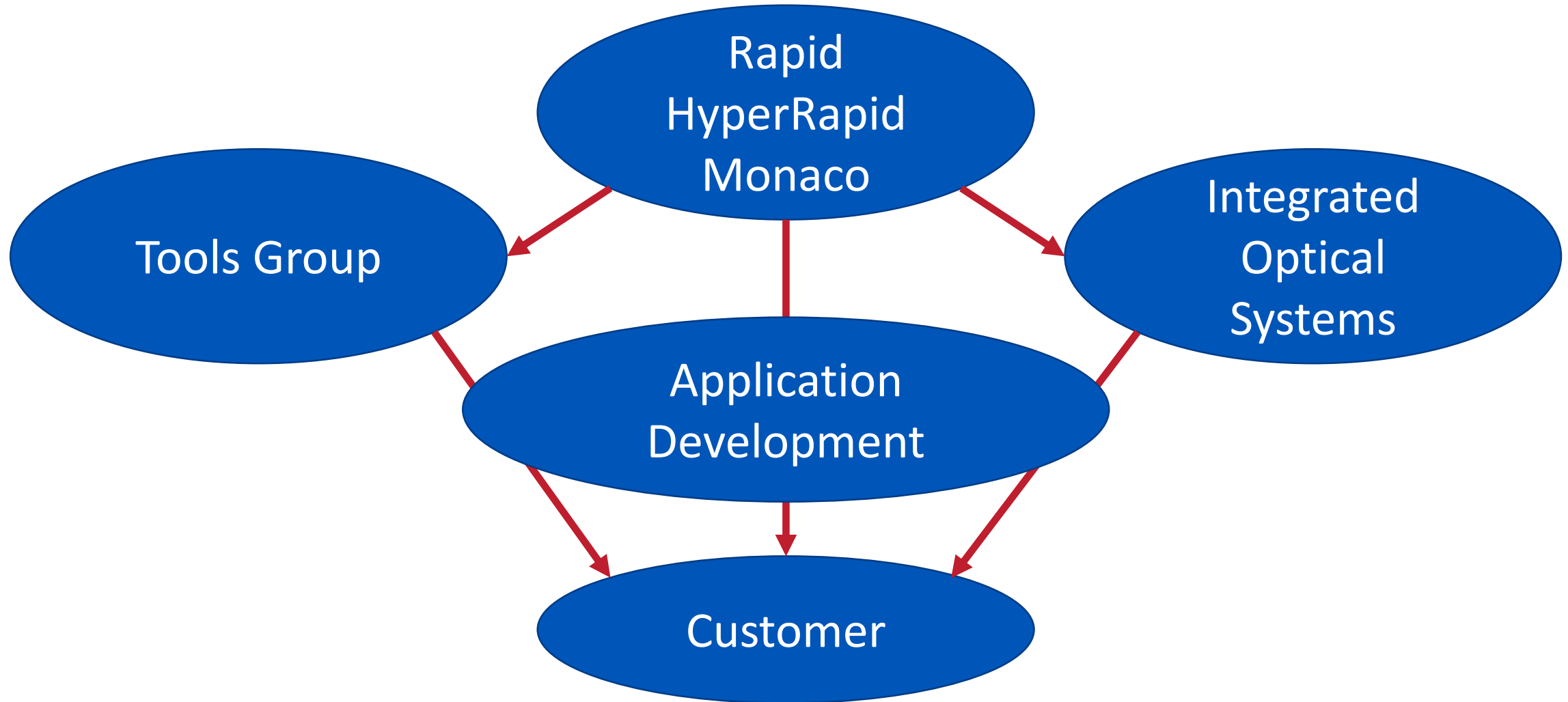
Accountability

Action

- Ensure a superior Customer Experience.
- Empower independent decision-making, emphasizing prompt escalation.
- Encourage collaboration across Global Functional Units and Business Units.
- Enable employee growth and encourage teamwork.
- Inspire through leadership and transparency.

Culture Supported by Structure and Leadership

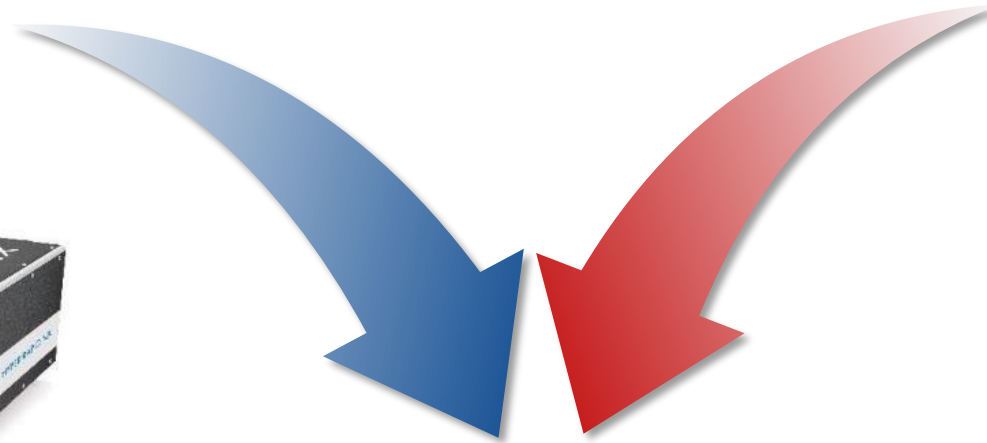
THE BEAUTY OF TEAMWORK



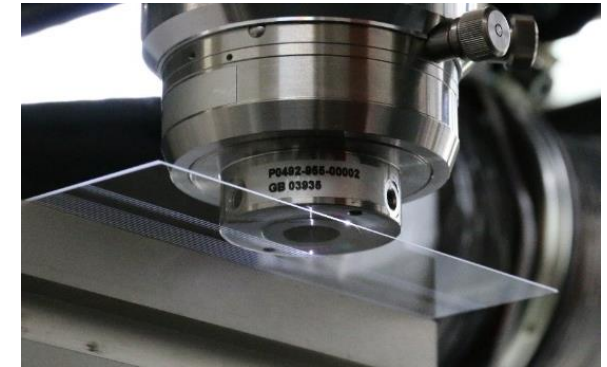
COHERENT & ROFIN JOIN FORCES

- Superior laser technology
- Service network

- Extensive process and system know-how
- Strong IP portfolio



Laser cutting of
transparent and brittle material



SmartCleave



SMARTCLEAVE – SOLUTIONS

- Application Package

- HyperRapid NX SmartCleave
- Beam Delivery with Processing Head
- Intellectual Property (IP)



- MPS Laser System

- Class 1 enclosure
- Process control
- Work piece handling



- CO₂ Laser for cleaving

- OEM Laser systems
- With scanner beam delivery

J-2 Series
180 Watts



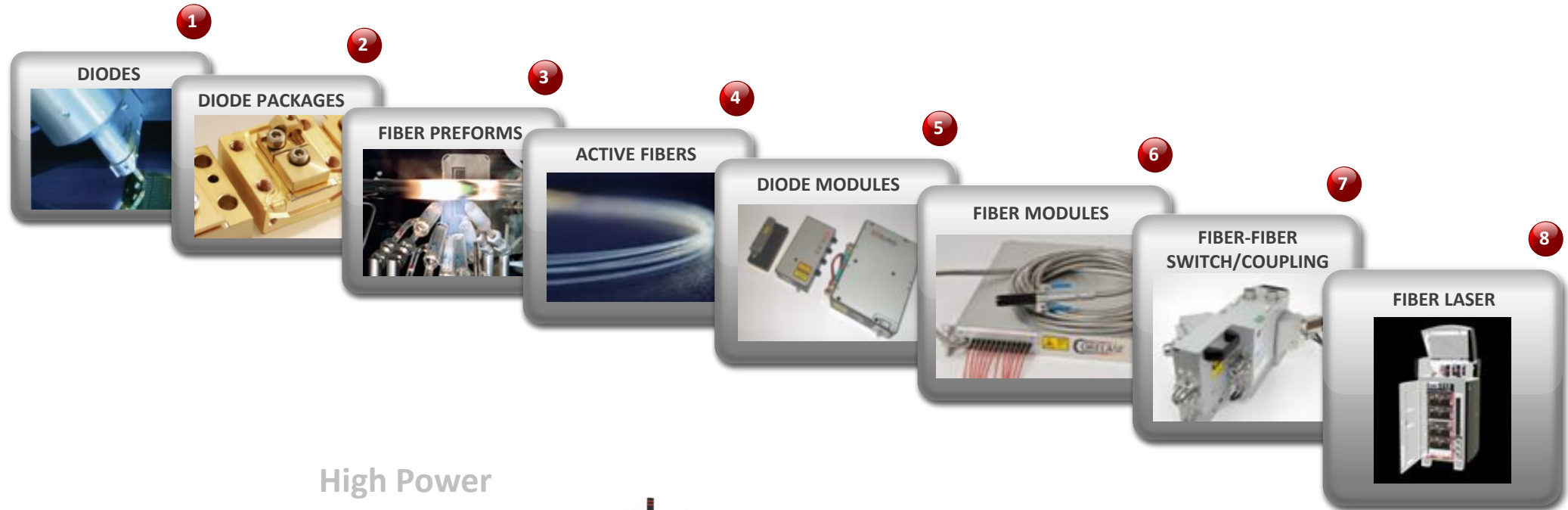
J-3 Series
250 Watts



J-5 Series
400 Watts



VERTICALLY INTEGRATED FIBER LASER PRODUCTION



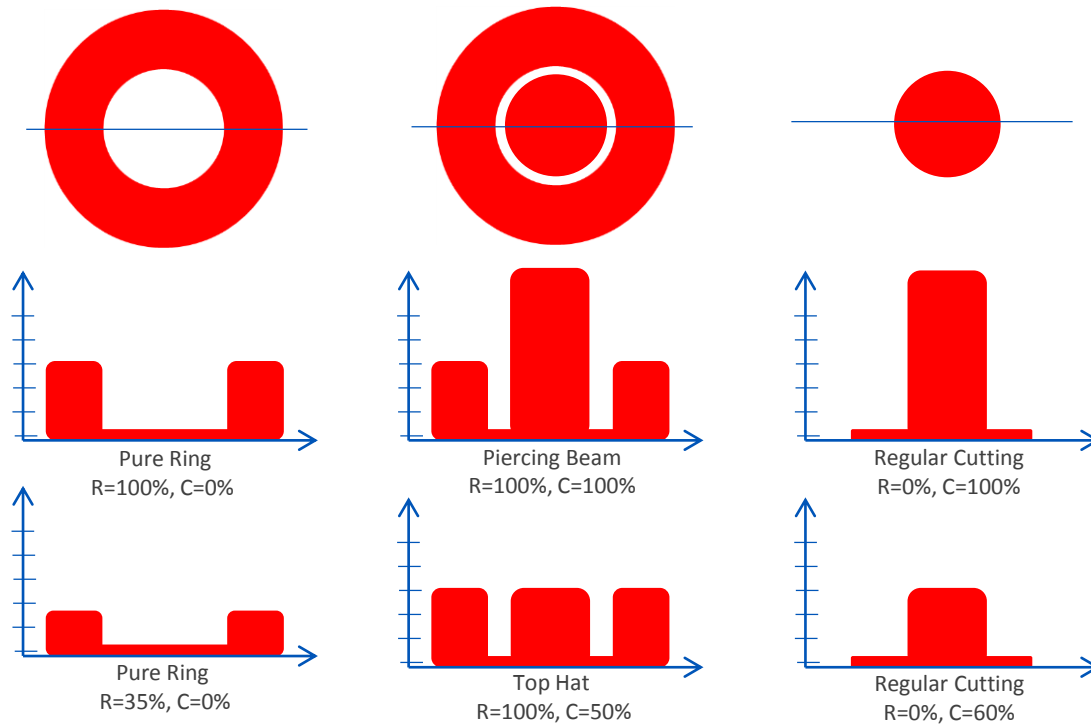
High Power



Low Power



ARM – ADJUSTABLE RING MODE



BEAM PROFILE EXAMPLES. INDEPENDENT CENTER AND RING MODULATION AND POWER LEVEL ADJUSTMENT AT 5 kHz RATE.

FACTORY SETTING FOR MAXIMUM POWER IN THE CENTER AND RING, CENTER 0 – 7.5 kW AND RING 0 – 10 kW WITH 2.5 kW INCREMENTS



10 KW ARM – LEADING EDGE LASER TECHNOLOGY

**NO MOVING PART to
CHANGE MODE**

**WORKS WITH off the
shelf FIBER LASER
PROCESS OPTICS and
SCANNERS**

**MODULAR AND
SCALABLE**

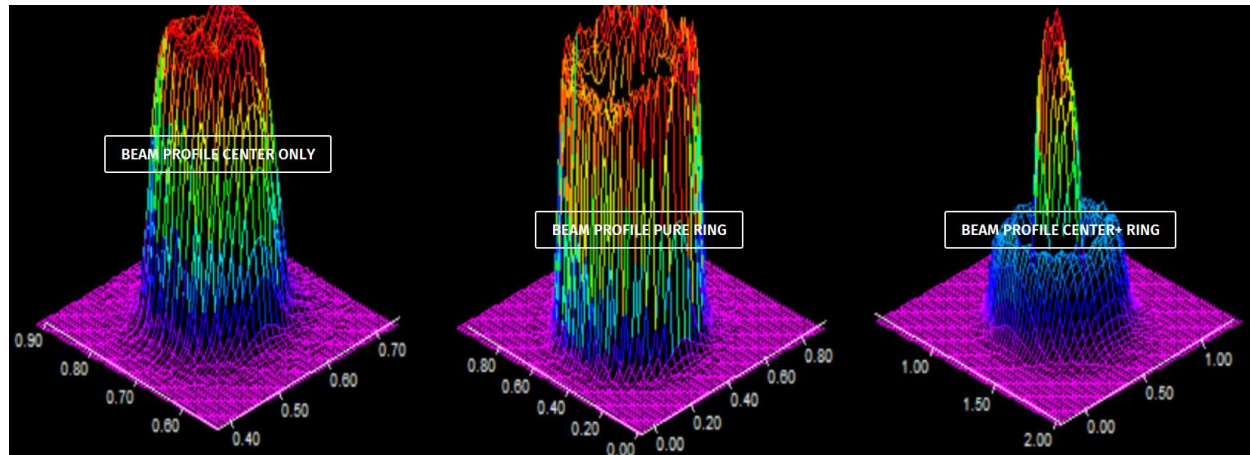


**REAL TIME POWER
MONITORING AND
CLOSED LOOP POWER
CONTROL**

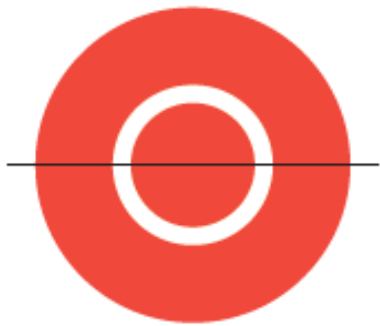
**STATE OF ART BACK
REFLECTION RESISTANCE**

**Up to 10kW OUTPUT
POWER WITH
EXCELLENT BEAM
QUALITY**

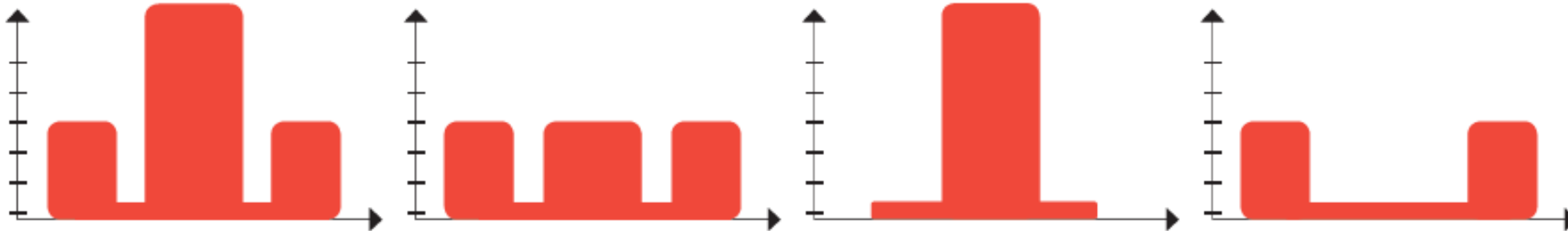
EXPERIMENTAL SETUP (ARM LASER)



- Power in the core and the ring can be adjusted 0-100%
- Power modulation up to 5000 Hz
- Core and ring parameters are independent from each other



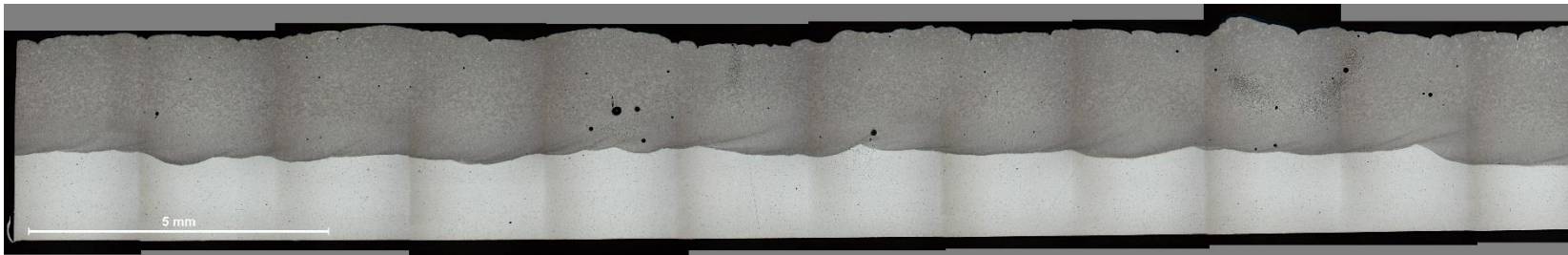
FREE POWER CONTROL SEPARATELY IN RING AND CENTER



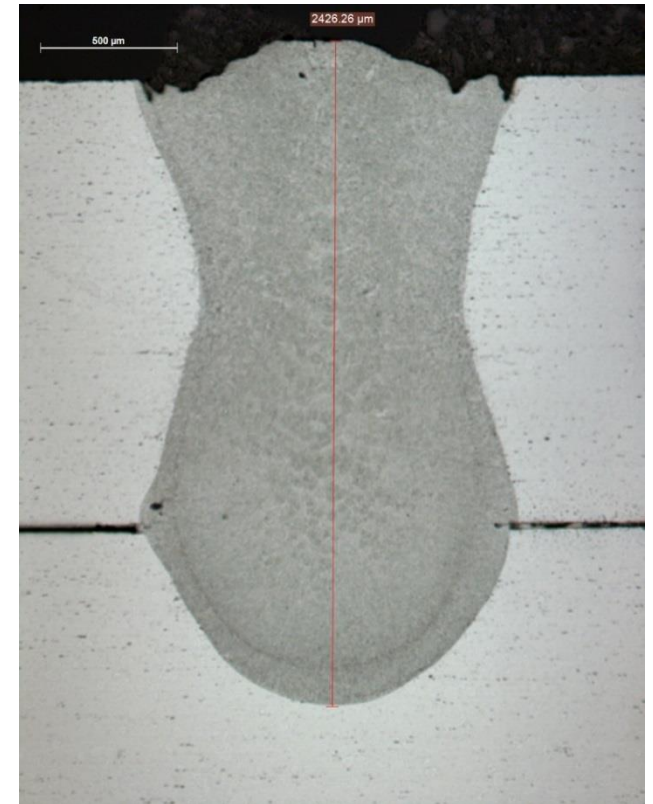
YIELD BENEFIT OF ARM

- Uniform penetration in Aluminum welding due to the combination of center and ring mode
- High quality weld with constant depth, no need for witness marks.
- Very low porosity compared with regular fiber laser welds.

Material: Sumitomo Metals GC 45;
5000 Series Al - 4.5% Mg-Cu alloy
Thickness: 1.6mm + 1.6mm
Weld speed: 200mm/s



LONGNITUDIAL SECTION ALONG WELD SEAM OVER 20 MM DISTANCE



CROSS SECTION OF THE WELD

ARM LASER APPLICATION TESTS HAVE SHOWN...

- Correlation between the BPP and the process results.
- Cutting quality as well as cutting speed can be improved by adapting the BPP to the material and sheet thickness.
- Welding of zinc coated material without gap between the sheets is possible.
- Stainless steel tubes and gear wheels can be welded with a process quality as it is known from CO₂.
- Copper and aluminum showed in first trials same positive effects as stainless steel.
- Power modulation already showed beneficial effects.
 - Next step will be the modulation of the core and the ring power independently from each other.
- Process will be transferred to other materials and dissimilar joints.







es technology

OPTOSKAND[™]
OPTIMIZE YOUR LASER



LASAG
A ROFIN COMPANY



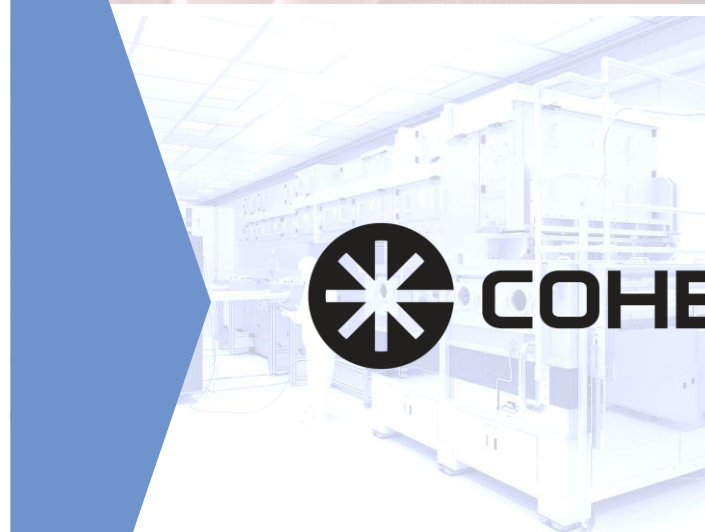
CORELASE

rofin
RASANT-ALCOTEC



NELC
东方激光

rofin
PMB ELEKTRONIK



COMPONENTS

KILOWATT

FLEXIBLE OLED DISPLAYS

CUSTOM OEM SUBSYSTEM

Q-SWITCHED

FAR INFRARED

WAVELENGTH

PICOSECOND

CONTINUOUS-WAVE SEMICONDUCTOR

THANK YOU FOR YOUR ATTENTION

LASER

SOURCES

EXCIMER

ATTOWATT

WATT

CO₂

TOOLS

VISIBLE

LASER LIFT-OFF

FIBER

HIGH POWER