“Exciting business with attractive potential”

% Group sales H1 2018

Addressable market
Current market share

X-RAY SYSTEMS

Source: Yxlon

IXS Customers

X-Ray Systems

CHF 760m

Tire

Electronics

Automotive & Foundries

Science & New Materials

Medical

Wheel

Aerospace

END USERS

COMPO-NENTS

OEMs

Source: Yxlon
THOMAS WENZEL
VICE PRESIDENT TECHNOLOGY, COMET GROUP

X-RAY SOLUTIONS IN THE DIGITAL WORLD: EXPANDING PROSPECTS BY CHANGING THE PERCEPTION
The future is driven by data and information
The future is driven by data and information

Digitalization, Big Data and Data Science push for extension of competencies in software

DATA IS THE NEW OIL
AND INTELLIGENT INFORMATION
IS THE NEW CURRENCY

Extract  Refine  Monetize

Hardware  (Sensor)

Software  (Intelligent data)
The future is driven by data and information

IXS has a strong asset: Information density of CT sensor is unrivalled

- High density of data combined with high reliability of extracted information is an enabling element for Big Data decision making using Machine Learning and AI
- CT delivers the largest number of high-quality features with outstanding significance

Information density of different sensor types

- Temperature sensor
- Optical sensor
- Ultrasonic sensor
- Computed tomography sensor
The future is driven by data and information

Machine Learning challenges classic image processing approaches

Today solutions for defect recognition are based on classic image filtering algorithms

Machine & Deep Learning opens a door to different approaches and solutions for recognition and classification tasks

The way forward: The traditional way embraces the new way
Creating value from data analysis will allow IXS to expand its business in future

X-ray solutions in the digital world: Expanding prospects by changing the perception

IXS | System Business

- Process optimization
- Enabler for new production methods
- Metrology
- Inspection

New capabilities
Existing capabilities
Creating value from data analysis will allow IXS to expand its business in future.
Optimizing customers’ processes

Process optimization and yield improvement – how can x-ray help?

Why are customers using x-ray in a production environment today?
To prevent faulty parts from hitting the street

Current focus is on defects
Information about defects is less than 5% of the total information contained in the acquired data

The remaining data contains thus far unused features and is DELETED
Optimizing customers’ processes

Process optimization and yield improvement – how can x-ray help?

Why should customers use x-ray in a production environment tomorrow?
To enable process optimization in addition to inspection of single parts

Future focus on process optimization
Make use of the unused features generated by collected data to reveal the process condition

Data gathered during an inspection

95% Information about process condition

5% Information about defects
Focusing on information that drives the competitiveness of our customers

Optimizing the “optimization loop” by providing better data at every stage of customers' production process

Define | Measure | Analyze | Improve | Control
Focusing on information transfer that drives the competitiveness of our customers

Optimizing customers’ processes

Manufacturing information system

Bi-directional communication through standardized protocols

Machine-to-machine communication and data transfer through standardized protocols lead to increased yield and improved verification time.
Creating value from data analysis will allow IXS to expand its business in future
Additive Manufacturing: Support along the process chain → CT enables 3D printing

IXS: Enabler for new production methods

Design

Manufacturing

Quality Control

Reverse Engineering

Qualification of powder

Quality assumption via CT scan of test pieces

Qualification of printing process via CT

Detection of defects via scan

New field of application

Existing field of application
Focusing on information that drives the competitiveness of our customers

**IXS: Enabler for new production methods**

- Ti6Al4V powder
- Volume of 50,000 powder particles in 2mm x 2mm x 2mm
- Voxel resolution of CT scan: 2µm
- In homogeneous powder structure
- Powder with "porosities"
- Information on internal porosity (open or closed), particle morphology (volume, surface area, sphericity) and presence of impurities

*Qualification of powder*
Partnering to enable ourselves

Partnering in technology and application: Essential to grow necessary competencies

Metrology

Tool making

3D visualization

Data science
X-ray solutions in the digital world: Expanding prospects by changing the perception

Key message

1. The best hardware combined with new technologies is the way forward

2. High density of information of IXS sensors can optimize customers’ production

3. IXS enables new production methods

4. Expanding market thanks to close partnership with leading experts
Thank you for your interest