AIXTRON Investor Presentation

Opto & Power Electronics
- Next Generation Displays
- SSL Adoption
- UV-C
- Renewable Energy
- Power Management
- E-Mobility
- Connectivity

Our technology. Your future.

Graphene & Nanomaterials
- Flexible Electronics
- Sensors
- Energy Storage
- High Performance Computing
- Composites

Memory & Logic
- High Performance Computing
- Memory / Big Data
- Sensors
- Smart Devices

IR Presentation – H1/2017
(FSE: AIXA, ISIN DE000A0WMPJ6)

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Forward-Looking Statements

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Due to rounding, numbers presented throughout this presentation may not add up precisely to the totals indicated and percentages may not precisely reflect the absolute figures for the same reason.

Our registered trademarks: AIXACT®, AIXTRON®, Atomic Level SolutionS®, Close Coupled Showerhead®, CRIUS®, Gas Foil Rotation®, OVPD®, Planetary Reactor®, PVPD®, TriJet®, Optacap™
Our Vision


Technology.

We are the recognized technology leader in complex material deposition.

Materials.

We enable our customers to successfully shape the markets of the future, exploiting the potential offered by new materials.

Performance.

We deliver the performance driving economic success through our expertise, our employees and the quality of our products.
Who we are

- Headquarters based in Herzogenrath, Germany
- Worldwide presence with 13 sales/representatives offices and production facilities
- Company founded in 1983 – over 30 years of experience
- ~ 700 employees
- Technology leader in deposition systems
- More than 3,000 deposition systems delivered all over the world
- State of the art R&D center and demo facilities
Global Presence

- Sunnyvale, USA
- Cambridge, UK
- Herzogenrath, Germany
- Knoxville, USA
- Seoul, South Korea
- Tokyo, Japan
- Shanghai, China
- Hsinchu, Taiwan
Technology Portfolio – Strategy

Executing Strategic Plans:

✓ Partner: OLED deposition
  - Establishing APEVA SE, a 100% subsidiary of AIXTRON; Joint Venture discussions in progress

✓ Freezing R&D: TFOS & TFE
  - Q1/2017: freezing III-V on Silicon (TFOS) R&D activities
  - Q2/2017: freezing Thin Film Encapsulation (TFE) R&D activities

✓ Asset sale: ALD/CVD
  - Selling ALD/CVD Memory product line to Eugene Technology in South Korea; Transaction expected to close in 2017
AIXTRON TECHNOLOGIES AND PRODUCTS

Technology Portfolio

Electrification of Transportation

AIXTRON SE
MOCVD Core Technology
Opto & Power

Internet of Things

Renewable Energy

Photonics
(e.g. VCSEL for 3D Sensing, Lasers for Datacom/Telecom)

SiC Power
(e.g. EVs, Charging Stations)

Specialty LED
(e.g. Micro LED, ROY for Fine-pitch Displays, Infrared, UV)

GaN Power
(e.g. Wireless Charging; RF)
**Revenue Analysis***

**H1/2017: by equipment & spares**

- Equipment: 83%
- Spares: 17%

**H1/2017: by end application (equipment only)**

- LED: 44%
- Silicon: 25%
- Power Electronics: 15%
- Optoelectronics: 13%
- Others: 3%

**H1/2017: by region**

- Asia: 82%
- Europe: 10%
- USA: 8%

* Rounded figures; may not add up
24 - Month Business Development

(Euro million)

Order Intake
(incl. equipment, service, spare parts)

Order Backlog
(equipment only)

Total Revenues
(incl. equipment, service, spare parts)

USD order intake and backlog were recorded at the prevailing budget rate (2017: $1.10/€)
USD revenues were converted at the actual period average FX rate (H1/2017: $1.09/€)
**Consolidated Income Statement**

<table>
<thead>
<tr>
<th>(€ million)</th>
<th>Q2/17 Adjusted</th>
<th>Q2/17 Restructuring</th>
<th>Q2/17 Actual</th>
<th>Q1/17 Adjusted</th>
<th>Q1/17 Restructuring</th>
<th>Q1/17 Actual</th>
<th>+/- %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues</strong></td>
<td>60.6</td>
<td>60.6</td>
<td>53.6</td>
<td>53.6</td>
<td>13</td>
<td></td>
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<tr>
<td><strong>Cost of sales</strong></td>
<td>45.9</td>
<td>45.9</td>
<td>40.0</td>
<td>40.0</td>
<td>15</td>
<td></td>
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<td><strong>Gross profit</strong></td>
<td>16.0</td>
<td>1.3</td>
<td>14.7</td>
<td>14.7</td>
<td>9</td>
<td></td>
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</tr>
<tr>
<td>%</td>
<td>26</td>
<td>24</td>
<td>27</td>
<td>25</td>
<td>1pp</td>
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<td><strong>Selling expenses</strong></td>
<td>2.7</td>
<td>2.7</td>
<td>2.6</td>
<td>2.6</td>
<td>3</td>
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<tr>
<td><strong>General &amp; admin expenses</strong></td>
<td>3.8</td>
<td>-1.3</td>
<td>5.1</td>
<td>4.1</td>
<td>-7</td>
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<tr>
<td><strong>R&amp;D</strong></td>
<td>14.8</td>
<td>-5.0</td>
<td>19.8</td>
<td>14.1</td>
<td>5</td>
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<td><strong>Net other operating income &amp; expenses</strong></td>
<td>-1.6</td>
<td>-1.6</td>
<td>-0.2</td>
<td>-0.2</td>
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<td><strong>EBITDA</strong></td>
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<td>-4.2</td>
<td>-2.7</td>
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<tr>
<td>%</td>
<td>-6</td>
<td>-19</td>
<td>11.1</td>
<td>-24</td>
<td>5pp</td>
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<tr>
<td><strong>EBIT</strong></td>
<td>-3.6</td>
<td>7.7</td>
<td>-11.3</td>
<td>-5.9</td>
<td>39</td>
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<td>%</td>
<td>-6</td>
<td>-19</td>
<td>11.1</td>
<td>-24</td>
<td>5pp</td>
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<td><strong>Net result</strong></td>
<td>-3.7</td>
<td>7.7</td>
<td>-11.4</td>
<td>-6.7</td>
<td>45</td>
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<tr>
<td>%</td>
<td>-6</td>
<td>-19</td>
<td>-25</td>
<td>6pp</td>
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<tr>
<td>(€ million)</td>
<td>Adjusted</td>
<td>Restructuring</td>
<td>Actual</td>
<td>H1/16</td>
<td>Actual</td>
<td>+/- %</td>
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<td><strong>Revenues</strong></td>
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<td><strong>Cost of sales</strong></td>
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<td><strong>Gross profit</strong></td>
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<td>2.3</td>
<td>28.3</td>
<td>10.0</td>
<td>n.m.</td>
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<tr>
<td>%</td>
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<td>18</td>
<td>9 pp</td>
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<td><strong>Selling expenses</strong></td>
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<td>5.8</td>
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<td><strong>General &amp; admin expenses</strong></td>
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<td>-1.5</td>
<td>9.4</td>
<td>8.3</td>
<td>-5</td>
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<td><strong>R&amp;D</strong></td>
<td>28.9</td>
<td>-10.6</td>
<td>39.5</td>
<td>26.0</td>
<td>11</td>
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<td><strong>Net other operating income &amp; expenses</strong></td>
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<td><strong>EBITDA</strong></td>
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<td><strong>EBIT</strong></td>
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<td>-47</td>
<td>39 pp</td>
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<td><strong>Net result</strong></td>
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<td>-24.9</td>
<td>-26.6</td>
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<tr>
<td>%</td>
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<td>-22</td>
<td>-48</td>
<td>39 pp</td>
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<td>(€ million)</td>
<td>30/06/17</td>
<td>31/03/17</td>
<td>31/12/16</td>
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<td>Property, plant &amp; equipment</td>
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<td>Goodwill</td>
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<td>Other intangible assets</td>
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<td>5.2</td>
<td>5.4</td>
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<tr>
<td>Others</td>
<td>2.1</td>
<td>2.1</td>
<td>2.4</td>
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<tr>
<td><strong>Non-current assets</strong></td>
<td><strong>137.5</strong></td>
<td><strong>150.6</strong></td>
<td><strong>156.5</strong></td>
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<tr>
<td>Inventories</td>
<td>36.4</td>
<td>49.9</td>
<td>54.2</td>
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<tr>
<td>Trade receivables</td>
<td>22.0</td>
<td>29.6</td>
<td>60.2</td>
<td></td>
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<tr>
<td>Others</td>
<td>6.0</td>
<td>5.6</td>
<td>5.3</td>
<td></td>
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<tr>
<td>Assets classified as held for sale</td>
<td>16.0</td>
<td>0.0</td>
<td>0.0</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Cash &amp; Cash Deposits</td>
<td>197.1</td>
<td>193.6</td>
<td>160.1</td>
<td></td>
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<tr>
<td><strong>Current Assets</strong></td>
<td><strong>277.6</strong></td>
<td><strong>278.6</strong></td>
<td><strong>279.7</strong></td>
<td></td>
<td></td>
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<tr>
<td>Shareholders' equity</td>
<td><strong>339.8</strong></td>
<td><strong>356.7</strong></td>
<td><strong>369.7</strong></td>
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<tr>
<td><strong>Non-current liabilities</strong></td>
<td><strong>2.5</strong></td>
<td><strong>4.2</strong></td>
<td><strong>4.2</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Trade payables</td>
<td>13.9</td>
<td>15.2</td>
<td>14.6</td>
<td></td>
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<tr>
<td>Advance payments from customers</td>
<td>33.6</td>
<td>30.5</td>
<td>26.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Others</td>
<td>25.3</td>
<td>22.6</td>
<td>21.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Current liabilities</strong></td>
<td><strong>72.7</strong></td>
<td><strong>68.3</strong></td>
<td><strong>62.3</strong></td>
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<td></td>
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<tr>
<td><strong>Balance Sheet total</strong></td>
<td><strong>415.0</strong></td>
<td><strong>429.2</strong></td>
<td><strong>436.2</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*) rounded figures; may not add up
## Consolidated Statement of Cash Flows*

<table>
<thead>
<tr>
<th>(€ million)</th>
<th>H1/17</th>
<th>H1/16</th>
<th>Q2/17</th>
<th>Q1/17</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net Result</strong></td>
<td>-24.9</td>
<td>-26.6</td>
<td>-11.4</td>
<td>-13.5</td>
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<tr>
<td><strong>Adjust for</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Cash Items</td>
<td>14.1</td>
<td>6.8</td>
<td>6.8</td>
<td>7.3</td>
</tr>
<tr>
<td>Changes in Working Capital</td>
<td>54.1</td>
<td>-19.4</td>
<td>13.3</td>
<td>40.8</td>
</tr>
<tr>
<td><strong>Cash Flow from Operating Activities</strong></td>
<td>43.3</td>
<td>-39.3</td>
<td>8.7</td>
<td>34.6</td>
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<tr>
<td>Capital Expenditures</td>
<td>-3.0</td>
<td>-5.9</td>
<td>-1.7</td>
<td>-1.3</td>
</tr>
<tr>
<td>FX effects / Other</td>
<td>-3.3</td>
<td>-2.9</td>
<td>-3.6</td>
<td>0.3</td>
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<tr>
<td><strong>Total Cash Flow</strong></td>
<td>37.0</td>
<td>-48.1</td>
<td>3.5</td>
<td>33.6</td>
</tr>
<tr>
<td><strong>Cash &amp; Deposits</strong></td>
<td>197.1</td>
<td>161.3</td>
<td>197.1</td>
<td>193.6</td>
</tr>
</tbody>
</table>

* Rounded figures; may not add up
Market Prospects

**Short-Term**
- Further increasing emergence of compound semiconductor based laser devices such as VCSELs for sensors in automotive and mobile applications.
- Further increasing emergence of compound semiconductor based laser devices for ultrafast Telecom and Datacom infrastructure and data center applications.
- Further increasing adoption of LEDs and specialty LEDs (in particular Red-Orange-Yellow, UV or IR) for Sensor, Fine Pitch Display and other applications.
- Increased emergence of wide band gap SiC based devices for energy efficient power management in automotive, consumer electronics and mobile applications.

**Mid- to Long-Term**
- Increased emergence of wide band gap GaN based devices for energy efficient power management and communications in automotive, consumer electronics and mobile applications.
- Increasing emergence of compound semiconductor based sensor devices for autonomous driving.
- Further progress in the development of GaN-on-Silicon LEDs and Wafer Level Packaging.
- Development of new wide band gap applications such as RF and System-on-Chip with integrated power management.
- Progress in the development of large area OLED displays requiring efficient deposition technologies such as OVPD.
- Increased development activity for specialized compound solar cell applications.
- Development of applications using Carbon Nanostructures (Carbon Nanotubes, Carbon Nanowires, Graphene, 2D-Materials).
- Development of alternative LED applications such as Visual Light Communication technology or Micro-LED Displays.
Our technology. YOUR FUTURE.
AIXTRON – Enabling Emerging Global Mega Trends

- Wireless Charging
- 3D Sensors
- AR / VR
- 5G Network
- Hyper-scale Data Center
- Electric Vehicle
- Autonomous Driving
- Electric Vehicle
- InP
- GaAs
- GaN
- InSb
- Ge
- ZnO
- SiC
- InP
- ...
AIXTRON Opto & Power – Positioned for Profitable Growth

* WSPM: wafer starts per month; Source: IHS, LEDinside, AIXTRON estimates

AIXTRON TECHNOLOGIES AND PRODUCTS

Power (e.g. EVs, Charging Stations Wireless Charging, GaN RF)

Specialty LED (e.g. Micro LED, ROY for Fine-pitch Displays, Infrared, UV)

Photonics (e.g. VCSEL for 3D Sensing, Lasers for Data-/Tele-com)

SSL + BLU LED

AIXTRON Position

#1 78%

#1 72%

#1 44%

#3 7%

higher

Relative Profitability

lower

Planetary system

AIX G5

AIX G4

Showerhead system

AIX R6

WSPM* CAGR 2016-2021e
Short Term: Compound Semiconductors in Next-Gen CE Applications

AIXTRON TECHNOLOGIES AND PRODUCTS

AIXTRON Enables GaAs Applications

- RF Power transistors
- MMIC
- Logic processor
- OLED Flexible Display
- 3D NAND
- 1X DRAM
- CNT based LiB
- RF energy solution
- MMIC
- Fast charger
- Base station for 5G
- Wireless PAs
- Noise cancelation
- GaN ICs

Potential New Applications

- 3D gesture sensors
- Iris scan
- Proximity sensor
- Camera autofocus
- Environmental scan
- HDMI interconnects
- Body functions
- Night vision camera
- Displays
- Camera Flash
- Wireless charger
- Pulsed power transistor

Potential CE markets (2017e)

- ~3bn units
  - Smartphones: 1.55 bn units
  - Laptops: 0.18 bn units
  - Tablets: 0.3 bn units
  - Smartwatches: 0.1 bn units
  - Wearables: 0.3 bn units
  - TV: 0.25 bn units
  - Others (DSC, Game consoles): 0.1bn

Customer profiles:

- Fragmented and global
- IDMs, PDM, foundries and start ups
- GaN MOCVD: 100+ players with epi capability
- GaAs MOCVD: 60+ players with epi capability
- CNT PECVD: shift toward commercial customers

Potential CE markets (2017e)

- ~3bn units
  - Smartphones: 1.55 bn units
  - Laptops: 0.18 bn units
  - Tablets: 0.3 bn units
  - Smartwatches: 0.1 bn units
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Customer profiles:

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- GaAs MOCVD: 60+ players with epi capability
- CNT PECVD: shift toward commercial customers
Mid Term: Compound Semiconductors in Connected Vehicles

AIXTRON Enables GaAs Applications

- **Vehicle speed sensing (IR)**
- **Night vision IR**
- **Emergency break assist (IR)**
- **Adaptive cruise control (IR)**
- **Pedestrian detection (IR)**
- **Driver condition monitoring (VCSEL)**

AIXTRON also in...

- **OLED**
- **CNT based LiB**
- **Charging infrastructure**
- **On board battery charger**
- **DC/DC conversion**
- **Main inverter**

AIXTRON Enables SiC Applications

AIXTRON Enables GaN Applications

- **Head up Displays**
- **48V system**
- **Lidar**
- **Wireless charger**
- **Headlights**
- **Infotainment**

Potential New Applications

- **Potential EV, BEV and PHEV**
  - ~4m units in 2020e
    - Power Semiconductor content per car internal combustion engine: $50
    - Power Semiconductor content per car electrical vehicle: $350

- **Potential ADAS**
  - ~25m units in 2019e
    - Semiconductor content partially automated: sub $100 per car
    - Semiconductor content fully automated: $580 per car

- **Customer profiles:**
  - Fragmented and global
  - IDMs, PDM, foundries and start ups
  - GaN MOCVD: 100+ players with epi capability
  - GaAs MOCVD: 60+ players with epi capability
  - CNT PECVD: shift toward commercial customers

Source: Gartner; Baader, Bernstein, Deutsche Bank, Stifel
Long Term: Compound Semiconductors in Smart Homes

AIXTRON also in...

- **AIXTRON Enables GaAs Applications**
  - OLED
  - CNT based LiB
  - Night vision IR
  - Terrestrial CPV

- **FTTH**
  - 3D gesture sensors
  - Motion sensors

- **Fast charger**
  - 5G Home Internet
  - Smart Lighting
  - LED

- **Wireless PAs**

AIXTRON Enables SiC Applications

AIXTRON Enables GaN Applications

Potential New Applications

Source: Gartner; Credit Suisse, Deutsche Bank, Stifel

- **Smart homes: Self-sufficient, environmentally friendly and connected**
  - Smart sensing: motion, environmental sensors, microphones
  - Processing: low power, high performance, microcontroller
  - Connectivity: Sub-GHz, Bluetooth, WiFi
  - Energy management: digital power, energy harvesting

- **Applications:**
  - appliances, home control, household robots, smart lighting, home multimedia, smart door locks, EV chargers, smart meters, improved security
**Carbon Nanomaterials – PECVD**

**Graphene and Carbon Nanotube Deposition Systems**

- Proprietary thermal and plasma enhanced chemical vapor deposition technology
- Excellent uniformity and reproducibility with fast turnaround cycle times
- BM platform: BM R&D (2-inch), BM Pro (4-inch and 6-inch), BM GB (4-inch glovebox), BM HT (high temperature, 1,700°C), BM300T (300mm)
- Graphene and carbon nanotube films for electronics, energy storage, thermal management, sensors and flexible/transparent applications

**Product features**

- Fast response heater and turnaround
- Thermal CVD
- Substrate and top heating
- Closed loop infrared wafer temperature control
- Plasma enhanced CVD with frequency control
- Flexible processing for different applications
- Low cost of ownership
- Easy maintenance and cleaning
- User management features and growth library

**Material Properties**

Graphene (2D) and Carbon nanotube (1D)
Unique combination of high electrical/thermal conductivity, mobility, flexibility and transparency

**AIXTRON Technology**

Serving R&D market today
AIXTRON BM Pro

**Enabling Applications**

Production ready for tomorrow
AIXTRON BM Pro 300
### Compound Semiconductors – Wide Band Gap (WBG) Power Electronics

<table>
<thead>
<tr>
<th>Consumer Electronics &amp; IT</th>
<th>Automotive</th>
<th>Energy</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Electronic appliances</td>
<td>• Infotainment</td>
<td></td>
<td>• UPS</td>
</tr>
<tr>
<td>• Computing</td>
<td>• GPS</td>
<td></td>
<td>• Industrial machines</td>
</tr>
<tr>
<td>• Wireless charging</td>
<td>• Connected car</td>
<td></td>
<td>• Building</td>
</tr>
<tr>
<td>• Power supplies</td>
<td>• Autonomous driving</td>
<td></td>
<td>• Mining, oil, gas power generation</td>
</tr>
<tr>
<td>• PFC</td>
<td>• EMI/EMC</td>
<td></td>
<td>• Shipping/Rail</td>
</tr>
<tr>
<td></td>
<td>• Adaptive cruise control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• General automotive</td>
<td>• General automotive electronic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>electronic</td>
<td>• HEV/EV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Charging station</td>
<td>• Charging station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Inverter / motor drives</td>
<td>• Inverter / motor drives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Converter</td>
<td>• Converter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Radar test applications</td>
<td>• Radar test applications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Power Switching**       |            |        |            |
| 1.2 kV                    |            |        |            |
| • Power Grid / Smart meter / appliances | | |
| • Solar / Wind inverters  | • Solar / Wind inverters | | |
| • Solar / Wind power DC distribution | | |
| • storage                 | • storage | | |
| • UPS                     | • UPS     | | |

| 30V                       |            |        |            |
| • Electronic appliances   | • Infotainment |        | • UPS      |
| • Computing               | • GPS       |        | • Industrial machines |
| • Wireless charging       | • Connected car |    | • Building |
| • Power supplies          | • Autonomous driving |    | • Mining, oil, gas power generation |
| • PFC                     | • EMI/EMC   |        | • Shipping/Rail |
|                           | • Adaptive cruise control | | |

<table>
<thead>
<tr>
<th><strong>GaN</strong></th>
<th><strong>GaN / SiC</strong></th>
<th><strong>SiC</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume segment</td>
<td>Niche segment</td>
<td>Volume segment</td>
</tr>
</tbody>
</table>
Compound Semiconductors – Wide Band Gap (WBG) Power Electronics

MORE EFFICIENT

SMALLER

FASTER

WBG Power Electronics

Example Applications in Pipeline

- Wireless charging laptops
- Electric Vehicles
- Data Centers
- Fast chargers

Source: Dell, DOE, Toyota
## OLED manufacturing process

<table>
<thead>
<tr>
<th>Front-end</th>
<th>Cell process equipment</th>
<th>Back-end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning</td>
<td>Cathode deposition</td>
<td>Final test</td>
</tr>
<tr>
<td>ITO deposition</td>
<td>Encapsulation (Thin film; TFE)</td>
<td>Aging</td>
</tr>
<tr>
<td>Coating</td>
<td></td>
<td>Glass cutting</td>
</tr>
<tr>
<td>Etching</td>
<td></td>
<td>Bonding</td>
</tr>
<tr>
<td>Stripping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test and repair</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Targeted technology**

Source: DisplaySearch, AIXTRON
## Product Description – OVPD

- Proprietary carrier-gas enhanced gas phase deposition approach for organic thin films
- Based on AIXTRON’s core competence of carrier gas enhanced vapor phase deposition
- Free scalability: suitable for all relevant substrate generations
- Manufacturing technology applicable for OLED displays, OLED lighting, organic semiconductors, and organic photovoltaic
- Proprietary STExS™ evaporation source technology: low thermal stress, high rates, continuous operation

### Product Features

- High deposition rates for high throughput
- Reduced thermal stress for organic materials
- High material utilization efficiency
- Flexible process control
- Simplified scaling due to
  - Close Coupled Showerhead and
  - Decoupled source technology
- Flexible integration solutions batch and inline
- Reduced number of deposition chamber and footprint
- Scalable: Available for substrate sizes up to Gen8.5 (≈2.3 x 2.5 m²)

"Disruptive deposition technology for cost efficient OLED manufacturing"
# Silicon Semiconductors – ALD (Sales Transaction in Process)

## Product Description – ALD

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>300mm ALD Technology</strong></td>
<td></td>
</tr>
<tr>
<td><strong>QXP-8300 Mini-batch system</strong></td>
<td></td>
</tr>
<tr>
<td><strong>High throughput:</strong> 2 Process Chambers – 8 Stations</td>
<td></td>
</tr>
<tr>
<td><strong>Up to 3 patented TriJet vaporizers and one bubbler</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Applications:</strong> DRAM, Logic and Flash High k Dielectric</td>
<td></td>
</tr>
<tr>
<td><strong>Metal electrode:</strong> ReRAM and PCRAM Active elements</td>
<td></td>
</tr>
<tr>
<td><strong>Proven in HVM with &gt;40% lower CoO and &gt;90% Uptime in DRAM and Flash fabs</strong></td>
<td></td>
</tr>
</tbody>
</table>

## Product Features

- Small volume confined process space ensure short ALD cycle time
- >40% less precursor consumption
- Efficient purge

- Isolated multi wafer processing with >40% higher throughput

- Close Coupled Showerhead for uniform distribution
- Flexibility and ease of maintenance
### AIXTRON Competitive Landscape

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>Europe</th>
<th>China</th>
<th>Korea</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compound</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GaAs/InP Optoelectronics, ROY LED</td>
<td>Veeco</td>
<td></td>
<td></td>
<td></td>
<td>TAIYO NIPPON SANSO</td>
</tr>
<tr>
<td>GaN LED</td>
<td>Veeco</td>
<td></td>
<td>TOPEC</td>
<td></td>
<td>TAIYO NIPPON SANSO</td>
</tr>
<tr>
<td>GaN Power</td>
<td>Veeco</td>
<td></td>
<td></td>
<td></td>
<td>TAIYO NIPPON SANSO</td>
</tr>
<tr>
<td>SiC Power</td>
<td>LPE</td>
<td></td>
<td></td>
<td></td>
<td>TEL</td>
</tr>
</tbody>
</table>

| **Silicon**    |             |             |        |        | WONIK IPS |

| **Organics**   |             |             |        |        | ULVAC   |
Equipment Order Intake per Quarter

- **Compound Semiconductor Market**
  - driven by telecom/datacom and mobile phone
  - driven by mobile phone penetration
  - driven by LED TV
  - driven by notebook backlighting

- **China Investments**
  - driven by strategic China investments
  - Overcapacity Absorption, Industry Consolidation
  - Advanced Optoelectronics driving demand
Annual Equipment Revenues by Application (excl. spares)

* Optoelectronics includes applications in Consumer Optoelectronics, Telecom/Datacom, Solar, etc.
# Consolidated Income Statement

* Rounded figures; may not add up

<table>
<thead>
<tr>
<th>(€ million)</th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues</strong></td>
<td>196.5</td>
<td>197.8</td>
<td>193.8</td>
</tr>
<tr>
<td><strong>Cost of sales</strong></td>
<td>140.2</td>
<td>147.9</td>
<td>154.1**</td>
</tr>
<tr>
<td><strong>Gross profit</strong></td>
<td>56.3</td>
<td>49.8</td>
<td>39.7**</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>29%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Selling expenses</strong></td>
<td>13.8</td>
<td>11.5</td>
<td>14.1**</td>
</tr>
<tr>
<td><strong>General &amp; admin expenses</strong></td>
<td>17.1</td>
<td>16.3</td>
<td>19.3</td>
</tr>
<tr>
<td><strong>R&amp;D</strong></td>
<td>53.9</td>
<td>55.4</td>
<td>66.7</td>
</tr>
<tr>
<td><strong>Net other operating income &amp; expenses</strong></td>
<td>-7.2</td>
<td>-6.7</td>
<td>-2.2</td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>-7.9</td>
<td>-16.4</td>
<td>-41.3</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>-21.4</td>
<td>-26.7</td>
<td>-58.3</td>
</tr>
<tr>
<td><strong>EBIT Margin</strong></td>
<td>-11%</td>
<td>-14%</td>
<td>-30%</td>
</tr>
<tr>
<td><strong>Result before tax</strong></td>
<td>-21.0</td>
<td>-26.0</td>
<td>-57.1</td>
</tr>
<tr>
<td><strong>Pre-Tax Margin</strong></td>
<td>-11%</td>
<td>-13%</td>
<td>-29%</td>
</tr>
<tr>
<td><strong>Net result</strong></td>
<td>-24.0</td>
<td>-29.2</td>
<td>-62.5</td>
</tr>
<tr>
<td><strong>Net Return on Sales</strong></td>
<td>-12%</td>
<td>-15%</td>
<td>-32%</td>
</tr>
</tbody>
</table>

**) 2014 figures adjusted to be comparable
# Balance Sheet*

*Rounded figures; may not add up

<table>
<thead>
<tr>
<th>(€ million)</th>
<th>31/12/16</th>
<th>31/12/15</th>
<th>31/12/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property, plant &amp; equipment</td>
<td>74.2</td>
<td>81.3</td>
<td>77.3</td>
</tr>
<tr>
<td>Goodwill</td>
<td>74.6</td>
<td>75.9</td>
<td>64.8</td>
</tr>
<tr>
<td>Other intangible assets</td>
<td>5.4</td>
<td>6.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Others</td>
<td>2.4</td>
<td>3.9</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Non-current assets</strong></td>
<td><strong>156.5</strong></td>
<td><strong>167.6</strong></td>
<td><strong>149.2</strong></td>
</tr>
<tr>
<td>Inventories, WIP &amp; Finished Goods</td>
<td>54.2</td>
<td>70.8</td>
<td>81.7</td>
</tr>
<tr>
<td>Trade receivables</td>
<td>60.2</td>
<td>26.0</td>
<td>26.3</td>
</tr>
<tr>
<td>Others</td>
<td>5.3</td>
<td>8.2</td>
<td>8.3</td>
</tr>
<tr>
<td>Cash &amp; Cash Equivalents incl. CD</td>
<td>160.1</td>
<td>209.4</td>
<td>268.1</td>
</tr>
<tr>
<td><strong>Current Assets</strong></td>
<td><strong>279.7</strong></td>
<td><strong>314.4</strong></td>
<td><strong>384.4</strong></td>
</tr>
<tr>
<td>Shareholders' equity</td>
<td>369.7</td>
<td>396.5</td>
<td>415.7</td>
</tr>
<tr>
<td><strong>Non-current liabilities</strong></td>
<td><strong>4.2</strong></td>
<td><strong>3.6</strong></td>
<td><strong>1.3</strong></td>
</tr>
<tr>
<td>Trade payables</td>
<td>14.6</td>
<td>9.8</td>
<td>16.4</td>
</tr>
<tr>
<td>Advance payments from customers</td>
<td>26.1</td>
<td>24.0</td>
<td>66.9</td>
</tr>
<tr>
<td>Others</td>
<td>21.6</td>
<td>48.0</td>
<td>33.2</td>
</tr>
<tr>
<td><strong>Current liabilities</strong></td>
<td><strong>62.3</strong></td>
<td><strong>81.8</strong></td>
<td><strong>116.5</strong></td>
</tr>
<tr>
<td><strong>Balance Sheet total</strong></td>
<td><strong>436.2</strong></td>
<td><strong>482.0</strong></td>
<td><strong>533.5</strong></td>
</tr>
</tbody>
</table>
## Consolidated Statement of Cash Flows*

<table>
<thead>
<tr>
<th>(€ million)</th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Flow from operating activities</td>
<td>-37.7</td>
<td>-45.7</td>
<td>-33.8</td>
</tr>
<tr>
<td>Cash Flow from investing activities</td>
<td>43.4</td>
<td>41.2</td>
<td>-23.2</td>
</tr>
<tr>
<td>Cash Flow from financing activities</td>
<td>0.3</td>
<td>-0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Exchange rate changes</td>
<td>-2.3</td>
<td>4.3</td>
<td>5.9</td>
</tr>
<tr>
<td>Net change in Cash &amp; Cash Equivalents</td>
<td>3.7</td>
<td>-0.3</td>
<td>-50.9</td>
</tr>
<tr>
<td>Cash &amp; Cash Equivalents (beginning of period)</td>
<td>116.3</td>
<td>116.6</td>
<td>167.5</td>
</tr>
<tr>
<td>Cash &amp; Cash Equivalents (end of period)</td>
<td>120.0</td>
<td>116.3</td>
<td>116.6</td>
</tr>
<tr>
<td>Change in Cash deposits</td>
<td>-52.8</td>
<td>-60.5</td>
<td>9.9</td>
</tr>
<tr>
<td>Free Cash Flow**</td>
<td>-42.9</td>
<td>-57.3</td>
<td>-47.0</td>
</tr>
<tr>
<td>Capex</td>
<td>5.3</td>
<td>13.3</td>
<td>13.4</td>
</tr>
</tbody>
</table>

** Operating CF + Investing CF + Changes in Cash Deposits, adjusted for acquisition effects

* Rounded figures; may not add up
Global Presence

**AIXTRON SE Headquarters**
Herzogenrath, Germany

Core of AIXTRON’s activities is the Technology and R&D Center near Aachen.

Focus on engineering and process development in MOCVD and organic semiconductors.

**AIXTRON Ltd.**
Cambridge, United Kingdom

Focus on key MOCVD reactor component technology, carbon-based nanotechnology systems, state of the art innovation and production of R&D tools.

**AIXTRON Inc.**
Sunnyvale, California, USA

Focus on silicon applications for leading suppliers of DRAM and CMOS.
Financial Calendar & Contact Data

• October 26, 2017  9M/2017 Results, Conference Call
• February 2018  FY/2017 Results, Conference Call
• April 2018  Q1/2018 Results, Conference Call
• May 2018  Annual General Meeting, Aachen

For further information please contact:

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Phone: +1 (408) 747-7140 ext. 1292  ▪  E-Mail: invest@aixtron.com