US demand to grow 8.5% annually through 2008

Demand for chemical sensors is forecast to surpass $4 billion in 2008, driven by new applications for established sensor products, falling prices for high performance and/or novel sensor types, and product innovation brought about by the use of microfabrication and other high tech manufacturing techniques.

The most rapid growth will be seen in newer technologies, such as optical sensors and biosensors, although nearly all products will benefit from improving performances, lower costs, and the penetration of new markets (especially large volume applications in the motor vehicle, industrial and consumer sectors).

However, in some sectors, chemical sensors will still face strong competition from alternative analytical technologies. In addition, key markets — such as industrial safety, emissions monitoring, and laboratory research — are maturing, which will limit opportunities for sensors used in these sectors.

Medical/diagnostic market to offer best opportunities

The large medical/diagnostic market will continue to offer the best opportunities. Annual growth rates in this sector will approach double digits, driven by strong interest in fast-response home and point-of-care testing and monitoring devices.

The motor vehicle market will also record favorable gains. Growth will be largely due to emerging applications such as cabin air quality and fuel cells, and continued strength in the large lambda sensor segment.

Other emerging and/or fast-growing markets include drug and alcohol detectors, HVAC equipment/indoor air quality sensors, volatile organic compound and ozone monitors, explosive detectors and chemical and biological warfare agent detectors. While sales of electronic noses and tongues are currently small, these products have the potential to generate multimillion dollar sales as manufacturers establish the reliability and usefulness of the devices.

Bio, optical sensors to be leading products

Biosensors, the largest product type, will continue to be led by glucose monitoring applications, although faster gains are expected in tests for cardiac risk, cholesterol, urinary tract infections, cancer and other serious illnesses, as well as in equipment to analyze blood and other critical analytes.

Optical chemical sensors (above) will see growth as prices fall and improvements such as smaller size and enhanced ruggedness are made.

Study coverage

These and other findings are detailed in Chemical Sensors: Liquid, Gas & Biosensors, the new Freedonia study priced at $3900. The study provides historical demand data to 2003 and forecasts to 2008 and 2013 by product and market. It also evaluates market share and profiles 51 industry competitors.

Table of contents & sample pages inside; other studies, order information on back
Demand for chemical sensors in motor vehicle applications is projected to advance 5.6 percent per year to $700 million in 2008. Growth will be driven by such as cabin air quality sensors, though oxygen sensor applications. Modern-day sophisticated and complex electromechanical devices depend on a host of environmental factors—engine temperature, oil pressure and quality, air flow, chassis control, exhaust composition, speed and acceleration, and a host of others. Changes in these variables can impact vehicle performance, passenger comfort and even safety, so sensors of various types are extensively employed to monitor and measure relevant environmental characteristics and transmit their readings to appropriate control instruments and systems. Historically, the use of chemical sensors was limited primarily to oxygen sensors in emissions systems. However, future growth will be driven by new uses such as cabin air quality control, fuel cells and other safety and environmental controls.

<table>
<thead>
<tr>
<th>TABLE VI-7</th>
<th>MOTOR VEHICLE MARKET FOR CHEMICAL SENSORS (million dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Vehicle Production</td>
<td>10880</td>
</tr>
<tr>
<td>$ sensor/vehicle</td>
<td>20.70</td>
</tr>
<tr>
<td>Motor Vehicle Chemical Sensors</td>
<td>225</td>
</tr>
<tr>
<td>By Application:</td>
<td></td>
</tr>
<tr>
<td>Oxygen Sensors</td>
<td>225</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>By Sector:</td>
<td></td>
</tr>
<tr>
<td>New</td>
<td>210</td>
</tr>
<tr>
<td>Aftermarket</td>
<td>15</td>
</tr>
</tbody>
</table>

Optical Sensors

Demand for optical sensors is forecast to post annual gains through 2008 of 11.4 percent to $192 million, as gains in infrared, fiber optic and emergent technologies expand uses for them. Detecting gases, in particular carbon monoxide, oxygen, and VOCs, will remain the most important application, although fiber optics are growing in the pH sector as well and optical sensors are important in dissolved gas monitoring in medical applications. Environmental monitoring and medical applications dominate the market currently, at over 70 percent of total usage. However, industrial applications are expected to see the fastest growth (from a small base), with target markets such as process controls in food and beverage and pharmaceutical manufacturing. Medical applications will register strong gains due to requirements for precision instruments and less cost-conscious end users. Optical sensors are used in continuous blood monitoring, neonatal care and a variety of respiratory applications.

The optical sensor market will see growth that almost matches that of biosensors as prices fall and improvements are made, such as smaller size and enhanced ruggedness. These sensors benefit from their high sensitivity, stability and immunity to interference. Optical sensors are also non-reactive and non-consumable, which means the do not have to be in contact with the analyte, or if they need to be, they can be in continuous contact.

Infrared Sensors

Demand for infrared sensors used in chemical sensor applications is forecast to increase to $120 million in 2008. Growth will be driven primarily by the development of new applications, made possible by significant improvements in sensor properties and sharply declining prices. Historically, the market for infrared chemical sensors was limited by size and cost issues, with particular carbon monoxide remaining the most important application. However, industrial applications are expected to grow as well, and optical sensors are expected to expand the market to include higher volume applications in the consumer and industrial sectors.

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#1792_________________04/2004_________________$4100

Sensors
The US market for sensors is analyzed in this study. It presents historical demand data and forecasts to 2008 and 2013 by property measured (e.g., temperature, pressure, physical properties, imaging, electrical and chemical properties), and by application (e.g., automotive, industrial, consumer/household, aerospace, private security, medical). The study also assesses the economic and end-user dynamics impacting sensor supply and demand, details industry structure and market share, and profiles major players.
#1774_________________04/2004_________________$3900

OEM Automotive Electronics in North America
Robust growth in North American OEM light vehicle electronics will be driven by mandated tire pressure and occupant position monitors, new airbag applications, adaptive cruise controls, and new roll-over protection/vehicle stability systems. In addition, stricter clean air laws will require better emissions control equipment. This study analyzes the North American OEM automotive electronics industry to 2007 and 2012 by application and country. It also evaluates market share and profiles key producers.
#1777_________________02/2004_________________$4000

Fuel Cells
US fuel cell demand will grow tenfold to $1.1 billion in 2008 as technology and economies of scale lower costs. Electric power generation is emerging as the first big market, to be followed by portable electronics. Proton-exchange membrane (PEM) types will remain dominant. Fuels will outpace other products and services, with methanol and natural gas leading gains. This study analyzes the US fuel cell industry to 2008 and 2013 by product and market. It also evaluates market share and profiles leading competitors.
#1759_________________02/2004_________________$4100

OEM Automotive Sensors in North America
Demand for OEM automotive sensors in North America will increase 10.7% annually through 2007. Gains will be driven by new mandated and market-driven sensor-based features. Safety and security offer the best market potential and will eventually surpass the now dominant engine/drivetrain and emissions control sectors. This study analyzes the US$2.7 billion North American OEM automotive sensors industry to 2007 and 2012 by type and application. It also details market share and profiles major firms.
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