

Analytical, Life Science & Diagnostics Association Industry Market Assessment - Quarterly Review

November 2022

Third Quarter (Q3 2022)



Artemis launch (NASA)

Prepared by
Strategic Directions International, Inc.



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Preface

This issue of the ALDA Industry Market Assessment Quarterly (IMAQ) Review prepared by Strategic Directions International, Inc. (SDi) addresses industry results for the third quarter of 2022 (July to September). As in the reviews presented in previous years, 15 product categories of particular interest to ALDA are addressed, which generally align with certain product categories presented in the **2022 SDi Global Assessment Report**. The base year data in this review are derived from the 2021 market data from the most recent **Global Assessment Report**, and the data for the second quarter stems from our analysis of the financial results of public companies in the space and our internal estimates of private company sales.

The ALDA Board selected SDi to provide industry growth and segmentation data on a quarterly basis as an aid to members for planning and performance measurement purposes based on current industry trends. SDi provides the IMAQ 2 months following the end of each calendar quarter. The next issue covering fourth quarter results will be published at the end of February 2023.

SDi has been providing consulting and market intelligence to industry participants for 40 years. Together with its sibling organizations within Science and Medicine Group, we offer complete market research support for our clients in the life science, analytical, medical imaging, and diagnostics industries. We are well-positioned to assess industry trends based upon our infrastructure for tracking market developments for both our consulting practice and our various publications including the **2022 SDi Global Assessment Report—The Laboratory Analytical and Life Science Instrumentation Industry**. SDi has recently published reports on HPLC and PCR, both with extensive end-user survey results. Last week, SDi published a report on instrumentation in the oil & gas industry, and future reports will discuss the pharma/bio industry and cell & gene therapies. SDi also stays on top of industry events with its industry leading newsletter, **IBO (Instrument Business Outlook)**.

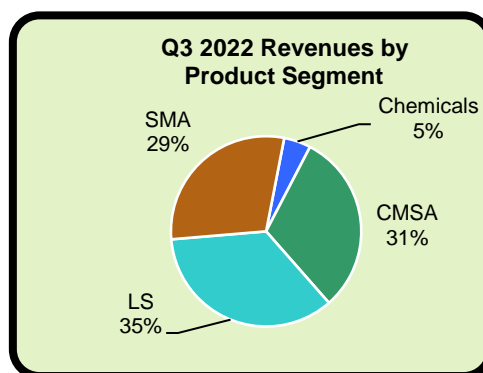
Many of our reports are published for the general industry reader, and in most cases on an annual basis. What differentiates this report is that it is specifically tailored to meet the needs of the ALDA membership. It is designed to present information on a more frequent quarterly timeframe, at a level of detail that is readily available and useful, and that focuses on the 15 technology markets most important to the membership. The aggregate market of these 15 ALDA segments represents about 75–80% of global industry revenues at end-user values. Of course, many ALDA member companies are involved in a number of technology areas, so multiple presentations are included to show the differences in market growth and regional and industrial prospects for those businesses.

PART A. THIRD QUARTER MARKET RESULTS

Q3 Revenues by Product Segment

\$Mil	2022	2021	Growth
Chrom, Mass Spec & Automation (CMSA)	4,616	4,298	7.4%
Spectroscopy and Materials Analysis (SMA)	4,335	4,084	6.2%
Life Science (LS)	4,938	4,890	1.0%
Analytical Chemicals	688	638	7.9%
Total	14,578	13,909	4.8%

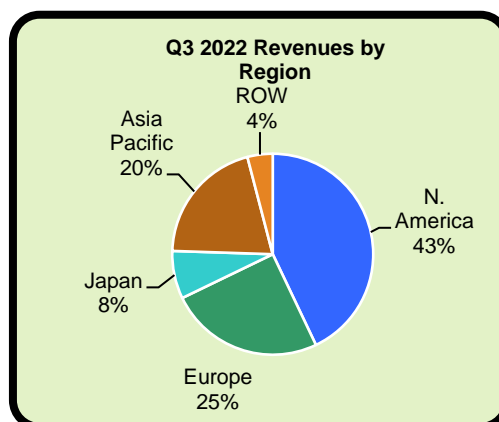
Total demand for the ALDA categories grew 4.8% in Q3 2022. Uncharacteristically, the life science products experienced the least growth in the quarter. This is primarily the effect of declining COVID-19 revenues negatively affecting products like nucleic acid prep, PCR, and sequencing. Other life science products performed well in the quarter. Analytical chemicals and the chromatography, mass spec & automation (CMSA) category saw the most growth in the quarter, slightly edging out spectroscopy and Materials Analysis (SMA).



Q3 Revenues by Region

\$Mil	2022	2021	Growth
N. America	6,258	5,806	7.8%
Europe	3,630	3,655	-0.7%
Japan	1,122	1,225	-8.4%
Asia Pacific	2,977	2,654	12.2%
ROW	592	569	4.0%
Total	14,578	13,909	4.8%

Asia Pacific demand made up 20% of total revenues in Q3, and was the only region to achieve overall double digit growth in the quarter. Chinese demand has largely recovered from any pandemic-related headwinds, and continued to see strong growth, but India saw the greatest overall gains in the quarter. North American growth was also healthy, with most end-markets remaining strong. Europe showed signs of slowing growth, and severe currency effects dragged Q3 growth into negative territory. Likewise, the shrinking yen resulted in negative growth for Japan, although organic growth was mildly positive.

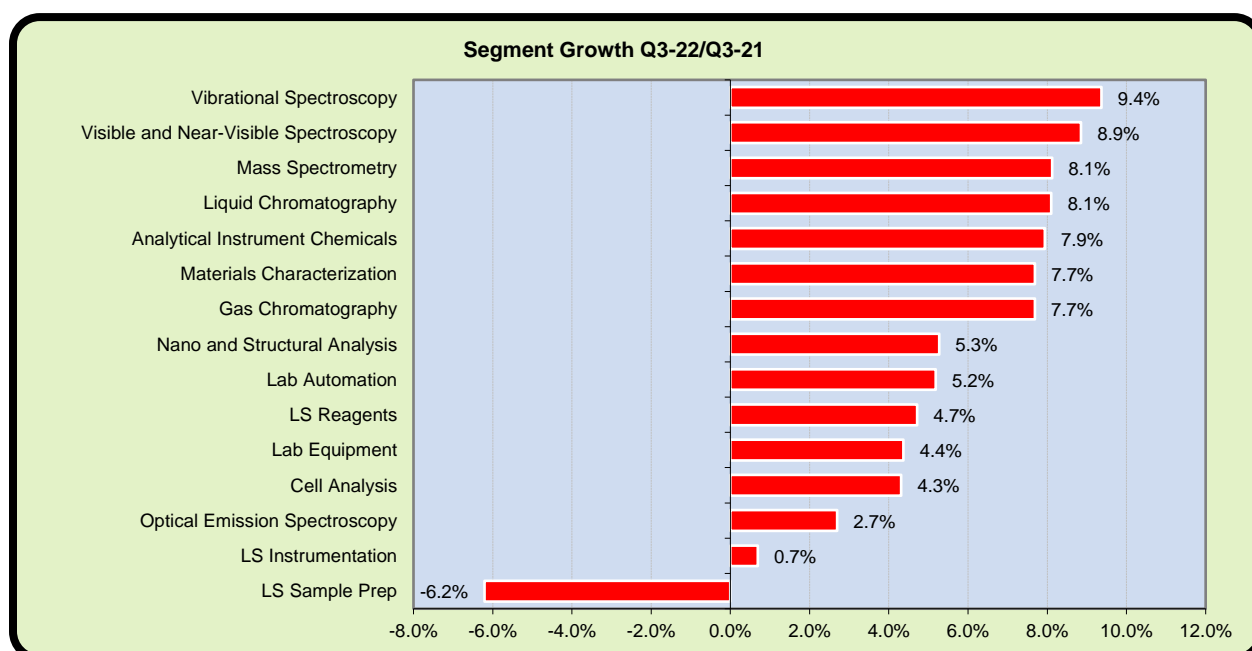


The market defined by ALDA consists of about 50 technology segments grouped into 15 reported segments, and accounts for 75–80% of the worldwide revenues for analytical and life science instrumentation. SDi regularly follows about 25 technology segments not included in the ALDA IMAQ Review, such as surface science techniques, informatics, separation techniques, physical testing, elemental analyzers, and several other technologies.

1. Q3 2022 Revenues by Product

Q3 Revenues by Product

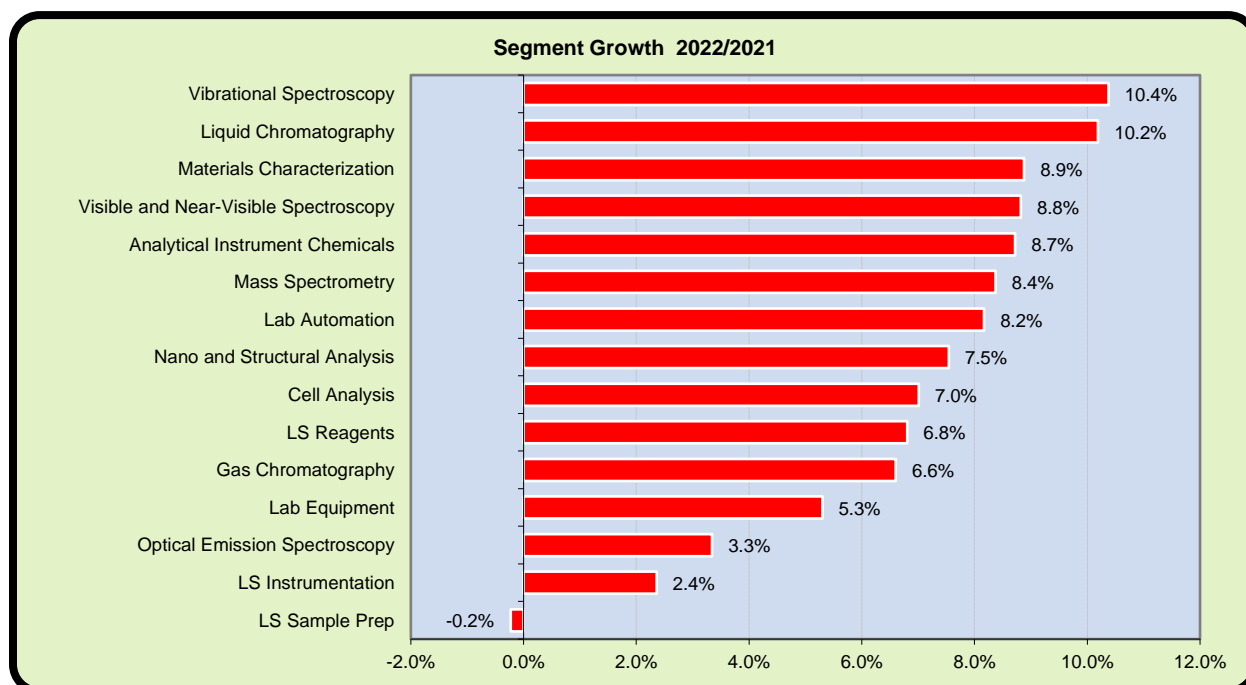
\$Mil	2022	2021	Growth
Spectroscopy and Materials Analysis	4,335	4,084	6.2%
Laboratory Equipment	834	799	4.4%
Materials Characterization	656	609	7.7%
Nano and Structural Analysis	1,485	1,411	5.3%
Optical Emission Spectroscopy	314	305	2.7%
Vibrational Spectroscopy	514	470	9.4%
Visible and Near-Visible Spectroscopy	533	489	8.9%
Chrom, Mass Spec & Automation	4,616	4,298	7.4%
Gas Chromatography	801	744	7.7%
Laboratory Automation	984	936	5.2%
Liquid Chromatography	1,530	1,415	8.1%
Mass Spectrometry	1,301	1,203	8.1%
Life Science	4,938	4,890	1.0%
Cell Analysis	445	427	4.3%
Life Science Instrumentation	1,153	1,145	0.7%
Life Science Reagents	2,177	2,079	4.7%
Life Science Sample Prep	1,162	1,239	-6.2%
Analytical Chemicals	688	638	7.9%
Total	14,578	13,909	4.8%



2. Nine Months 2022 Revenues by Product

Nine Months Revenues by Product

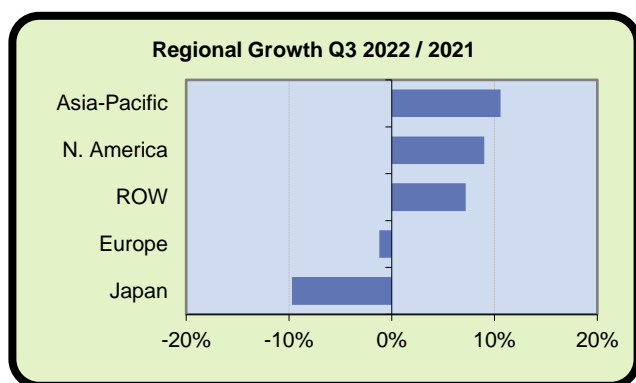
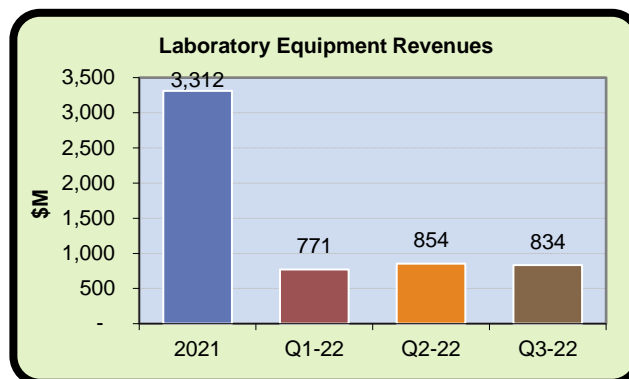
\$Mil	2022	2021	Growth
Spectroscopy and Materials Analysis	13,031	12,129	7.4%
Laboratory Equipment	2,458	2,335	5.3%
Materials Characterization	1,891	1,737	8.9%
Nano and Structural Analysis	4,641	4,316	7.5%
Optical Emission Spectroscopy	1,008	975	3.3%
Vibrational Spectroscopy	1,532	1,388	10.4%
Visible and Near-Visible Spectroscopy	1,500	1,379	8.8%
Chrom, Mass Spec & Automation	14,232	13,100	8.6%
Gas Chromatography	2,380	2,233	6.6%
Laboratory Automation	3,171	2,932	8.2%
Liquid Chromatography	4,907	4,453	10.2%
Mass Spectrometry	3,774	3,482	8.4%
Life Science	16,361	15,717	4.1%
Cell Analysis	1,268	1,185	7.0%
Life Science Instrumentation	3,533	3,452	2.4%
Life Science Reagents	7,657	7,169	6.8%
Life Science Sample Prep	3,902	3,911	-0.2%
Analytical Chemicals	2,062	1,897	8.7%
Total	45,686	42,843	6.6%



PART B. LAB EQUIPMENT

Overview

The lab equipment market is comprised of a group of relatively low-cost instruments including: centrifuges, electrochemistry products, and laboratory balances. The market includes initial systems sales, aftermarket purchases and service. Lab equipment experienced a 4.4% year-over-year growth as the market returns to pre-pandemic product demand levels.

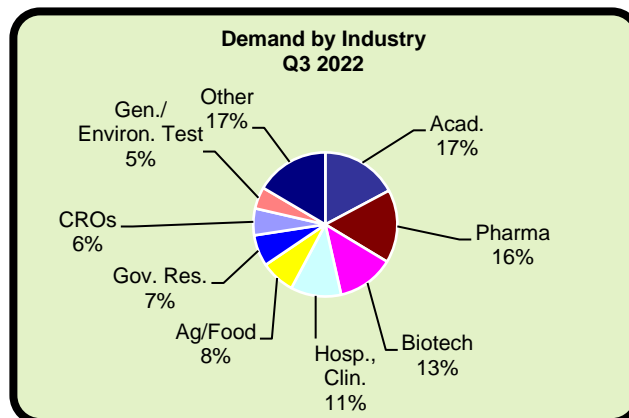


Regional Demand

Regional growth continued to be strongest in Asia Pacific in Q3, with a growth of 10.6%. The lab equipment market in this region is led by high demand in China despite headwinds from lockdowns. North America and ROW followed in terms of growth. Europe and Japan continue to struggle with strong negative currency effects, pulling their growth into the negative again this quarter. Europe suffered from knock-on effects of the Russian invasion of Ukraine.

End-User Markets

The pharmaceutical industry represents nearly a fifth of the total demand and grew well this quarter. Industrial demand was also high, with semiconductors being a standout customer type. While academia makes up the greatest portion of the market, it grew at a comparatively slow rate this quarter. Demand for COVID-19 related products continued to wane this quarter. In contrast, environmental testing, food and water safety all saw strong growth this quarter as well.



Market Developments

Danaher announced that its Environmental & Applied Science segment (EAS) will become a separate, publicly traded company. One EAS instrument business is Hach, a major participant in the electrochemistry market. In September, Thermo Fisher Scientific debuted new SECURE-Spin connectivity features for the Thermo Scientific General Purpose Centrifuge platform, enabling greater user access control and data management in regulated lab environments.

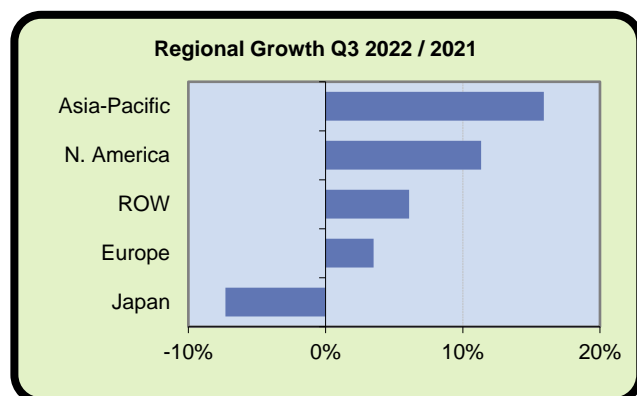
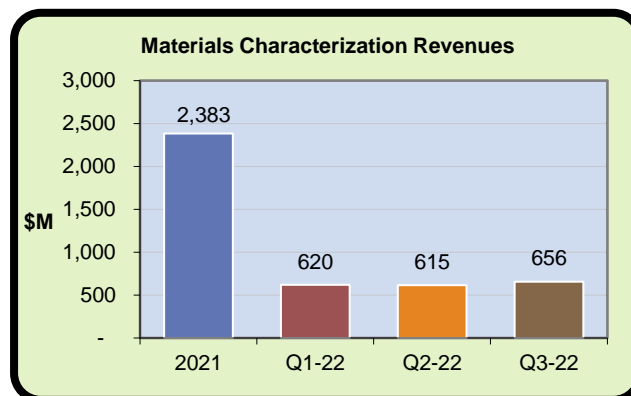
Near Term Prospects

With supply chain challenges now under control, many labs are returning to pre-pandemic spending patterns rather than stockpiling products. New behavior paired with reduced COVID-related product needs will reduce growth in demand in the coming months. Overarching geopolitical and economic aspects will also continue to slow growth across all regions over the next year.

PART C. MATERIALS CHARACTERIZATION

Overview

The materials characterization market comprises thermal analysis, calorimetry, particle characterization (now including particle counters), and viscometry/rheometry. Revenue estimates encompass initial systems, components, consumables, and service, but exclude small amounts of life science reagents and analytical chemicals. During the third quarter of 2022, demand grew by 7.7% year over year.

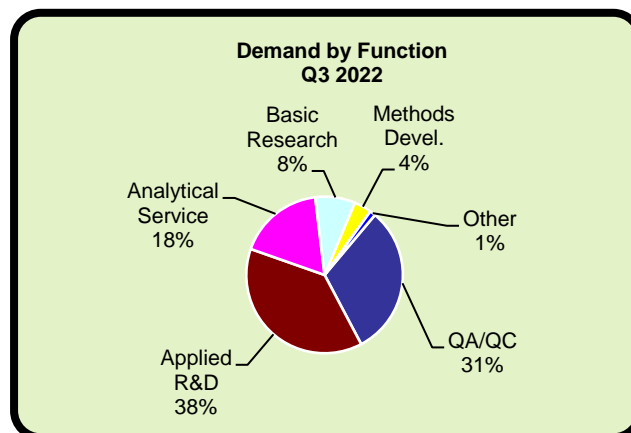


Regional Demand

Asia-Pacific demand saw the greatest growth in the quarter. Demand was driven in part by lockdown easing in China. North America demand was strong, as customers appear to be absorbing higher prices. Europe saw a strong quarter despite inflation challenges, with rheometry devices in the energy markets driving growth. Growth in Japan continues to compare negatively with the prior year. Industrial applications in chemicals saw broad based regional strength.

End-User Markets

Applied R&D provides the primary area of demand for rheometry and particle characterization, where testing is done to improve things from batteries and semiconductors to plastics and pigments. Thermal analyzers are also valuable in drug development in the pharmaceutical industry, where growth remained strong this quarter. In QA/QC, thermal analyzers are used in drug development and industrial chemical final product validation.



Market Developments

In September, Waters/TA introduced new powder rheology software. In June, Micromeritics launched the new Auto Chem III, the latest version of their catalyst analyzer line with a new auto cooling and auto trap system. In August, KPM Analytics launched a new Alveolab device that is the first Alveograph instrument able to analyze whole wheat doughs for all rheological characteristics.

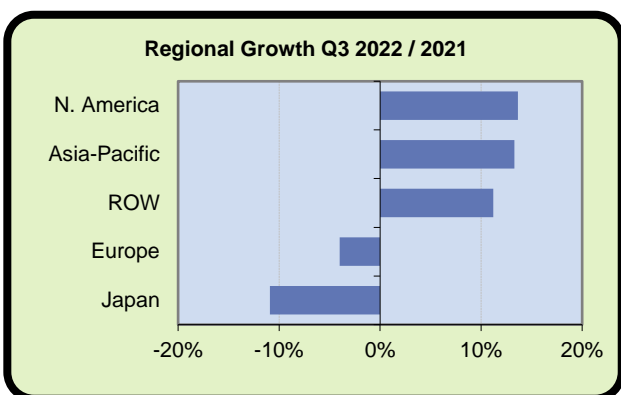
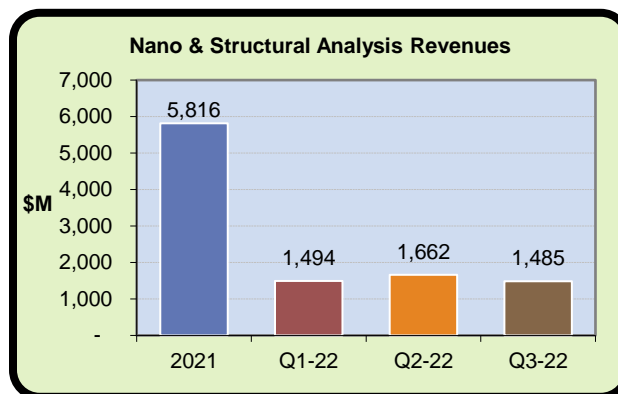
Near Term Prospects

Industrial applications have shown strengthening demand both in energy and chemicals that is expected to continue through the end of the year. Pharma applications remain strong, but the specter of economic slowdown in the US and Europe may hinder growth near term.

PART D. NANO AND STRUCTURAL ANALYSIS

Overview

The nano and structural analysis market is composed of four segments: nuclear magnetic resonance (NMR), electron microscopy, X-ray diffraction (XRD) and X-ray fluorescence (XRF). Revenue estimates include initial systems, components, consumables, and service, but exclude small amounts of life science reagents and analytical chemicals, which are considered elsewhere. For the third quarter of 2022, revenues grew 5.3%. Electron microscopy and XRF led in terms of growth, while NMR was weak.

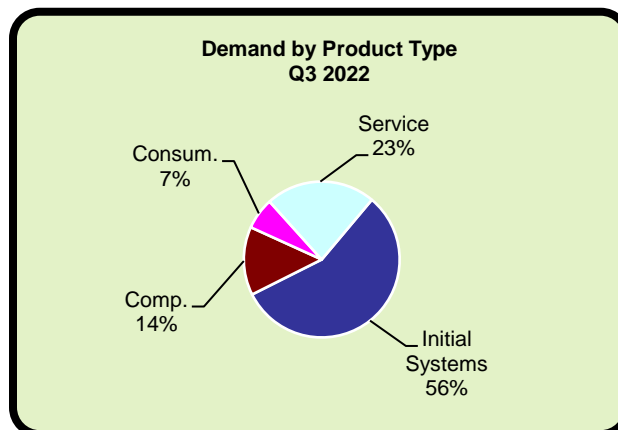


Regional Demand

North America and Asia-Pacific both saw growth in the teens for Q3. Given negative currency effects across most regions, Asia-Pacific customers had higher organic growth. Rest-of-World demand was also up strongly, in part due to an easy comparison from 2021. Europe and Japan were both dragged down into negative territory by currency effects. Organically, Europe grew in the mid single digits, while Japanese demand was relatively flat.

Product Segmentation

By a small margin, initial systems made up the majority of demand in this segment. Most of the products within this category are quite sophisticated, and service revenues form the second largest product segment, making up nearly a quarter of the total. Many of these systems are highly modular as well, so that additional components like analyzers, detectors, probes also make up a significant part of the market, with greater demand than for consumables.



Market Developments

In August, Olympus agreed to sell its Evident subsidiary to Bain Capital for \$3.1 billion. Evident includes the Olympus microscopy, NDT and XRF product lines. Also in August, Calibre Scientific acquired Agar Scientific, which supplies TEM grids and other microscopy supplies and equipment. In October, **Thermo Fisher Scientific** launched the Thermo Scientific Glacios 2 Cryo-TEM.

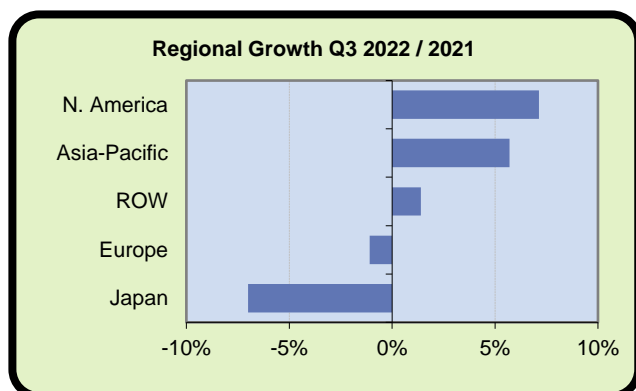
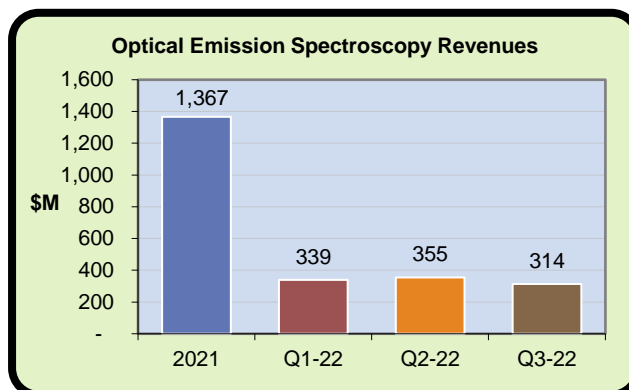
Near Term Prospects

Industrial markets performed well in Q3, and this should carry through the end of the year, supporting these technologies. One ominous sign is the first hints that investments in the semiconductor industry are slowing. But continuing efforts to build additional capacity to offset supply chain disruptions should forestall any decline in demand.

PART E. OPTICAL EMISSION SPECTROSCOPY

Overview

The optical emission spectroscopy market comprises atomic absorbance (AA), inductively coupled plasma (ICP) and arc/spark optical emission spectroscopy. Revenue estimates encompass initial systems, components, consumables, and service, but exclude analytical chemicals, which are considered elsewhere. In Q3, total demand grew 2.7% year over year. While demand from industrial customers was strong this quarter, currency effects retarded overall growth.

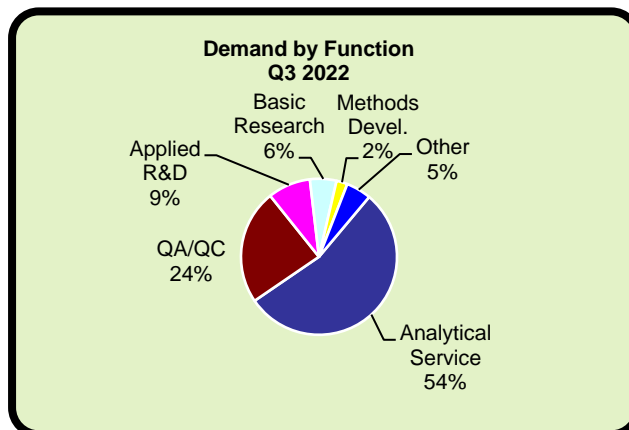


Regional Demand

North America produced the most growth for OES products in Q3. Asia Pacific followed with growth in the mid-single digits, boosted by high industrial and environmental demand in China, despite some headwinds related to continued lockdowns. China, Japan, and Europe all experienced strong negative currency effects this quarter, limiting their success and pulling Japan and Europe into negative growth overall. In addition, several vendors continue to experience headwinds due to sanctions against Russia.

End-User Markets

Analytical service represents both the lion's share of the overall OES market and the fastest growing function. Environmental and hospital testing labs are major contributors to this segment, particularly for AA and ICP. Growth was buoyed by increased demand for water testing. QA/QC makes up nearly a quarter of the market and grew modestly in Q3, driven by demand from oil & gas and metals customers for arc/spark technology.



Market Developments

In September, Alpha Resources, an aftermarket supplier of consumables and reference materials, announced the expansion of its Thermo Fisher Scientific-compatible products to include supplies for OES analysis.

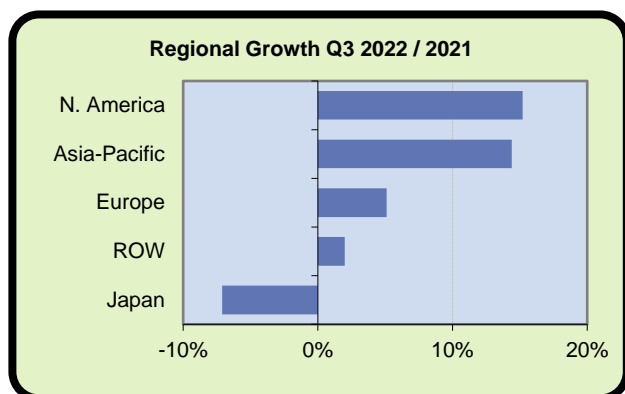
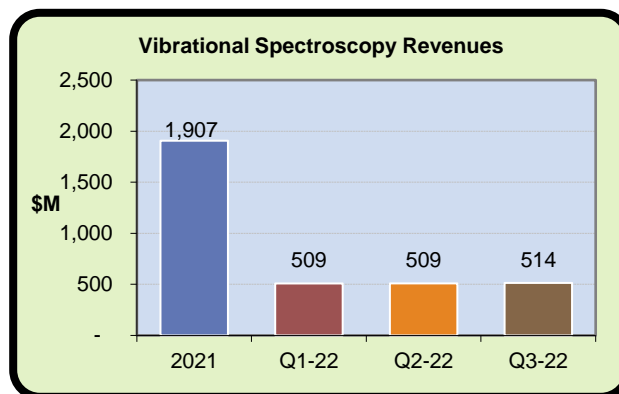
Near Term Prospects

While inflation and economic instability worldwide will limit spending over the next several months, steady demand from industrial, environmental, and food testing labs in both the private and public sector will sustain the OES market.

PART F. VIBRATIONAL SPECTROSCOPY

Overview

The vibrational spectroscopy market comprises infra-red, near-infrared (NIR), and Raman spectroscopy, including both conventional and Fourier transform (FT) methods. Revenue estimates encompass initial systems, components, consumables, and service, but exclude analytical chemicals, considered elsewhere. The total market grew 9.4% year over year in Q3 of 2022. Growth was driven by strong pharma/bio and semiconductor end markets.

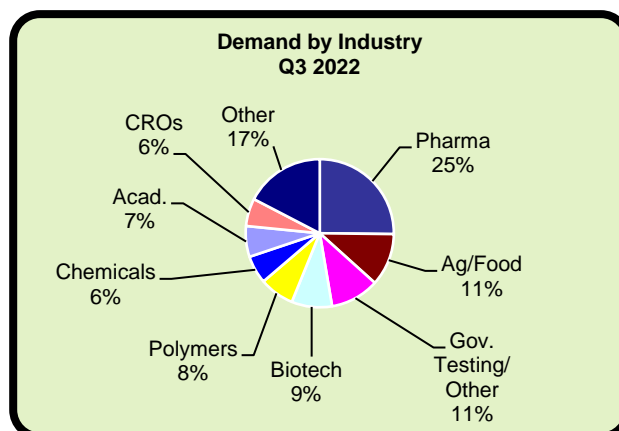


Regional Demand

North America led the regional growth, driven by pharma/bio customers. Growth in APAC was also strong driven by environmental testing and the food and beverage industries. Organic growth was stable in Japan but growth was sent into negative territory by currency effects. Continued lockdowns in China slowed down economic growth. Apart from Russia, European markets saw strong instrument sales.

End-User Markets

Pharma is the largest and fastest growing end market for vibrational spectroscopy, with strong demand especially in the US. Agricultural and environmental testing also saw strong growth in developing APAC markets. Food safety demand was strong in China. Government testing and academia are additional major sources of demand and experienced modest demand increases in Q3.



Market Developments

In September, AgroCares, a global agtech company delivering data-driven solutions for nutrient testing, and trinamiX, a provider of mobile spectroscopy, announced a partnership that integrates trinamiX's hardware into AgroCares' next generation Nutrient Scanner solution. Relying on NIR technology, it enables customers to determine the chemical composition of soils, feed, and leaf.

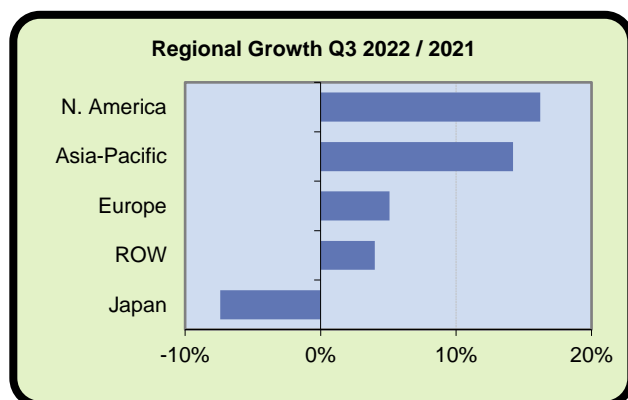
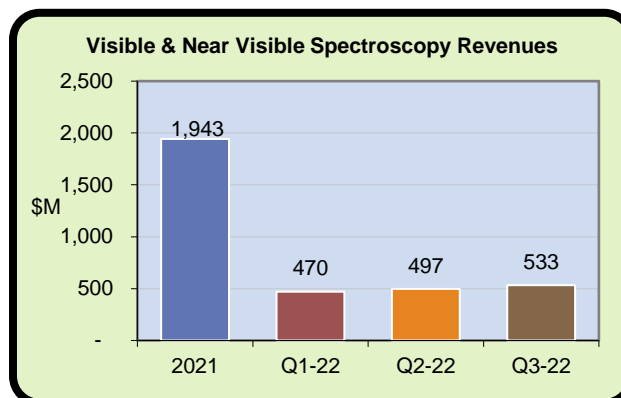
Near Term Prospects

COVID related revenues are expected to decline worldwide, with some minor effect on these markets. Pharmaceutical spending will continue to lead growth for vibrational spectroscopy into Q4. Economic instability continues to plague European markets. Negative currency effects remain a concern for Japan.

PART G. VISIBLE AND NEAR VISIBLE METHODS

Overview

The visible and near-visible methods market comprises UV/Visible spectroscopy, fluorescence, color measurement, ellipsometry, polarimetry, and refractometry. Revenue estimates include initial systems, components, consumables, and service, but exclude life science reagents and analytical chemicals, considered elsewhere. Visible and near visible methods achieved 8.9% year over year growth in Q3 2022 and was led by UV-Vis spectroscopy.

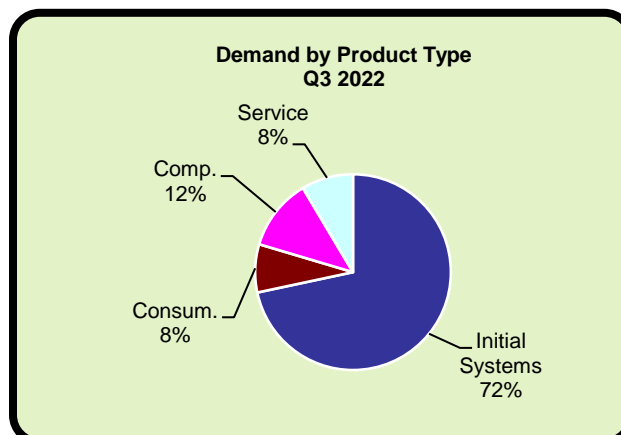


Regional Demand

Strong growth from the pharma/bio sector contributed to mid-teens growth in North America. Growth for APAC was similarly vigorous with strong support from ag/food customers. China's growth was marginally impacted by lockdowns and negative currency effects. Effects of the Russian invasion of Ukraine and inflation continued in Q3, causing headwinds. Organic growth was flat in Japan, but was offset by strong negative currency effects.

Product Segmentation

Initial systems typically make up nearly three quarters of all demand with UV/Vis accounting for the largest share. This quarter saw strong bookings in the initial systems for instruments across all sectors, particularly in the North American and Asia-Pacific markets. Growth for initial systems was led by instrument sales for environment testing in developing markets. After-market support has also been strong in Q3 driven by academic and pharma customers.



Market Developments

In September, PG Instruments released a new range of UV-Vis spectrophotometers. The T65 single-beam instrument features a wavelength range of 190–1100 nm and a fixed band pass of 1.8 nm. The double-beam T85 is available in two models that have been redesigned to share the product identity of the T65.

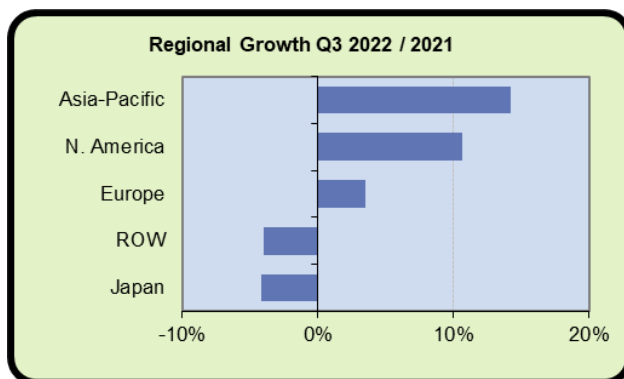
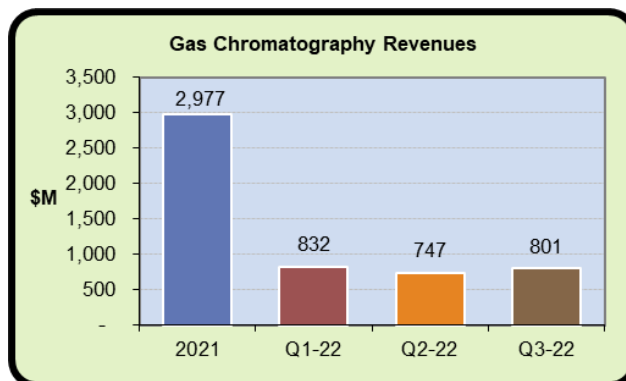
Near Term Prospects

UV-Vis spectroscopy will continue to lead the market with strong support from pharma/bio customers through the end of the year. Growth in China is expected to be impacted by lockdowns, but not to a severe extent. Economic instability and inflation are expected to limit spending, especially in European markets.

PART H. GAS CHROMATOGRAPHY

Overview

The gas chromatography market comprises not just the chromatographs, but also associated detectors, including mass spectrometry (GC-MS). Revenue estimates encompass initial systems, components, consumables, and service, but exclude analytical chemicals, considered elsewhere. Market demand grew by 7.7% in the third quarter of 2022 compared to last year, driven by increased demand from chemicals, energy, and pharma/biotech applications.

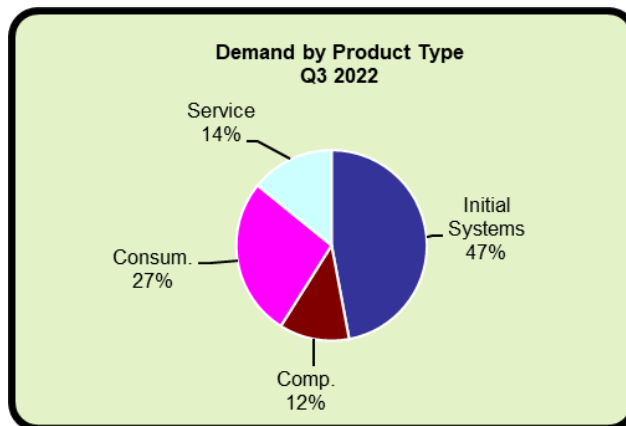


Regional Demand

The Asia-Pacific region, led by China, dominated growth in the third quarter buoyed by chemical analysis, polymers, food and environmental applications. Growth remained strong in North America supported by sustained pharma, industrial and environmental testing. Japan experienced high demand for its green transformation initiatives, but currency effects hampered revenues. Despite decreased sales to Russia, demand in Europe for clinical and industrial applications helped offset currency headwinds.

Product Segmentation

Initial systems represented almost half of the market demand. Growth was driven by GC and GC/MS instrument replacement and upgrades in the industrial and applied markets. Improved sensitivity and AI functions have been key upgrades that improve laboratory performance. The energy sector also continued to support strong demand for systems and aftermarket. Aftermarket items include columns, carrier gas, vials and volatile extraction tools.



Market Developments

Shimadzu and PACE Analytical Services developed an alternate test procedure to EPA method 1613B, using Shimadzu GC-MS/MS technology. The new method allows the use of GC-MS/MS in place of high-resolution mass spectrometry (GC/HRMS), which should result in cost savings.

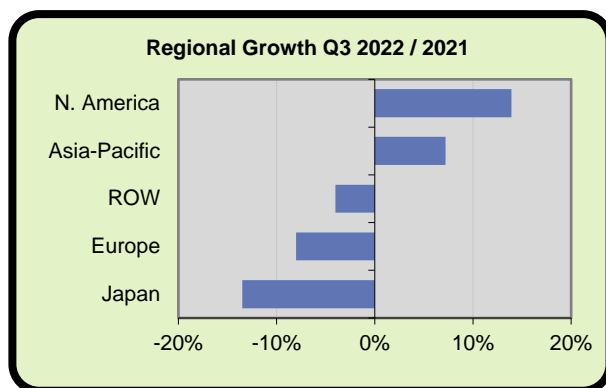
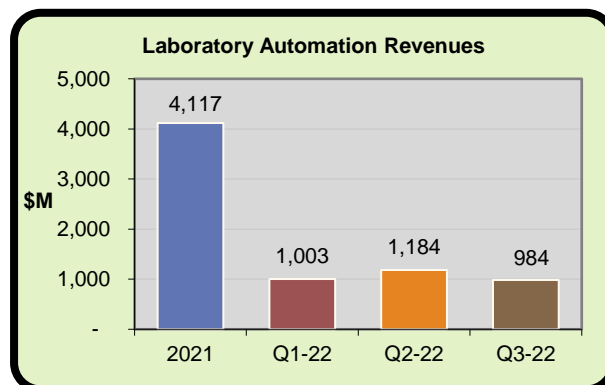
Near Term Prospects

In Q4, the GC market is projected for mid-single-digit growth. The pharma/biotech and industrial markets are expected to be the main drivers globally. Growth will continue to be strong in the Asia-Pacific and particularly in China and India. Growth in the European market will remain slow, bedeviled by an energy crisis, currency woes and the loss of the Russian market.

PART I. LAB AUTOMATION

Overview

The lab automation market is composed of liquid handlers, robots, microplate readers, and multiplex/high-throughput ELISA systems. Revenue estimates encompass initial systems, components, consumables, and service, but exclude life science reagents, considered elsewhere. Lab automation demand increased 5.2% year-over-year, led by multiplex/high throughput ELISA systems for immune-related research applications.

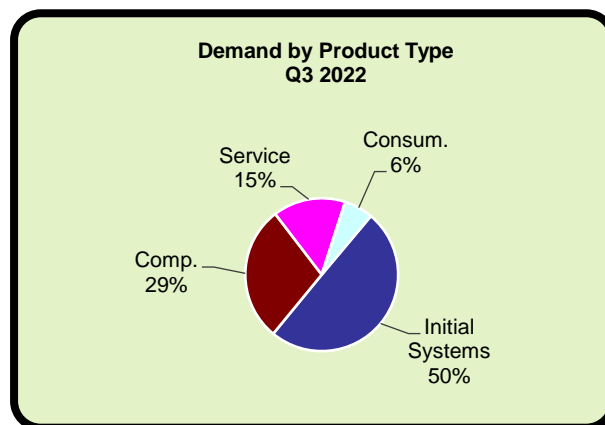


Regional Demand

Asia-Pacific and North America were the fastest growing regions with mid-single to double digit growth during the quarter. Demand in China was the fastest growing in Asia, supported by continued development of domestic pharma/bio industries. Other regions faced a tough comparison to the previous year due to COVID-19 demand declines and macro-economic pressures confronting the broader market.

Product Segmentation

Automated systems are often used in the pharma/bio and life science industry to reduce error and minimize contamination. Automated workstations, liquid handlers and plate readers represent half of the market. Apart from initial systems, components like software integration, modular components, and the maintenance of instrument service contracts were a significant part of demand in the quarter. Overall, initial systems make up half the market. Consumables growth was relatively slow in Q3 2022.



Market Developments

Hudson Robotics merged with Art Robbins Instruments. Flow Robotics A/S, an automated liquid handling firm, partnered with Tek-Matic to integrate the flowbot ONE pipetting robot with the KX-2 robot arm. Waters introduced the Extraction+ Connected Device automation software for the Andrew+ Pipetting robot. Scitara partnered with Agilent to offer an integrated LIMS and chromatography software portfolio.

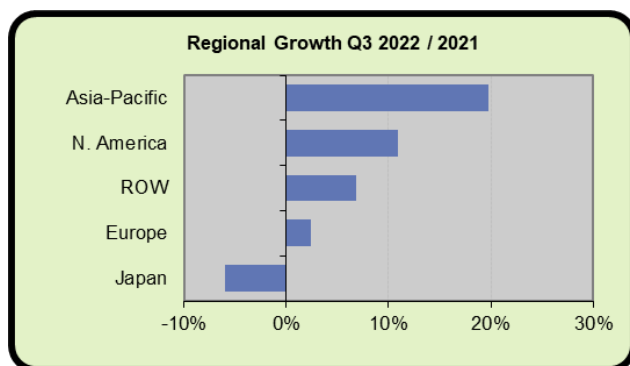
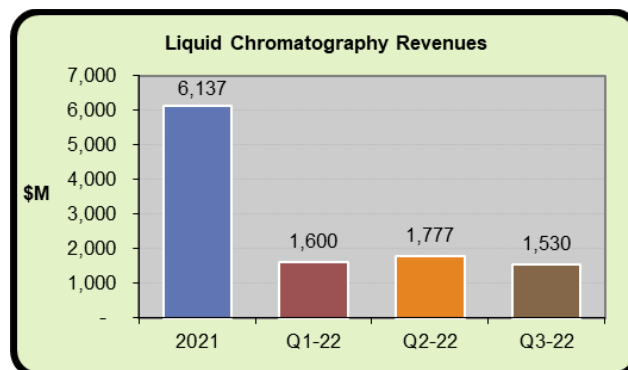
Near Term Prospects

High throughput systems, software components, and liquid handling will trend higher in the near-term. Demand for lab automation instrumentation will be muted in the Europe and Asia-Pacific regions.

PART J. LIQUID CHROMATOGRAPHY

Overview

The liquid chromatography market comprises HPLC, IC, and LPLC. Revenue estimates encompass initial systems, components, consumables, and service, but exclude analytical chemicals, considered elsewhere. In the third quarter of 2022, demand for liquid chromatography grew by 8.1% compared to the same quarter last year, with broad strength across pharma/bio, applied and industrial applications.

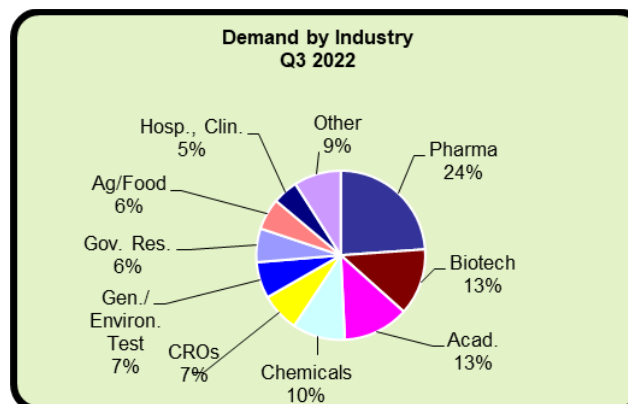


Regional Demand

Asia Pacific was the fastest growing region in Q3, promoted by significant demand from the industrial sector in China. China saw double digit growth, despite recovering from lockdown conditions. Demand in North America has lagged a bit, but still very positive results in the quarter. Growth in Japan was completely offset by currency effects. Europe experienced broad-based growth, especially in the industrial and pharma sectors, but dampened by geopolitical conflicts in the region and currency effects.

End-User Markets

The pharmaceutical and biotech industries comprised over one-third of the market demand in Q3. Advances in chromatography technology has spurred instrument replacements and upgrades across all regions to support drug development. Despite strong growth earlier this year, pharma/bio spending became more tentative due to recession fears. The industrial sector dominated growth this quarter, driven by semiconductor, chemicals, and polymers. The versatility of IC and HPLC to be used with other essential instruments such as MS has further propelled demand.



Market Developments

Agilent partnered with Mettler Toledo to address error-prone sample preparation. Laboratories will be able to automatically transfer weighing results and the associated metadata from Mettler Toldedo LabX Balance software to Agilent OpenLab software.

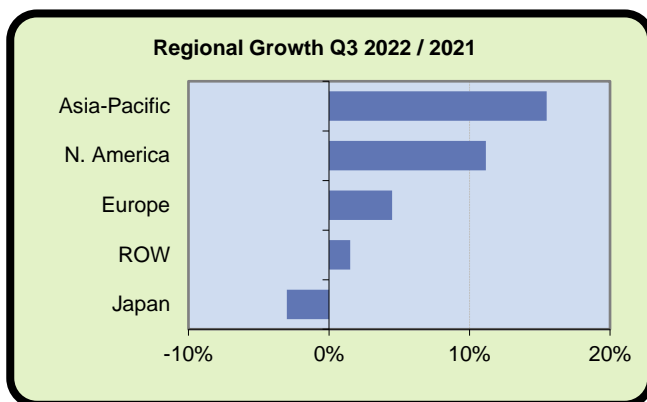
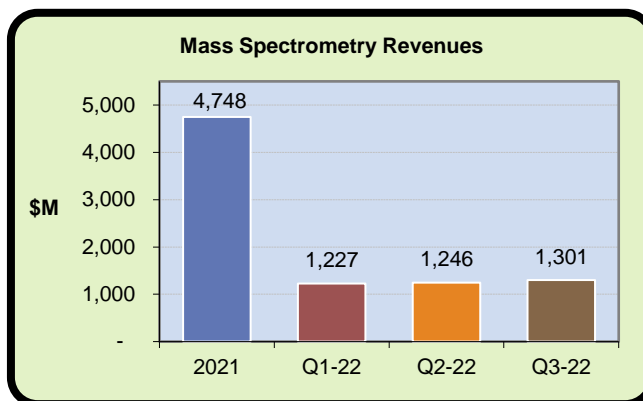
Near Term Prospects

In Q4, macroeconomic issues, a potential energy crisis and COVID-19 lockdowns will hamper growth across all regions, especially Europe. China's successful handling of lockdowns and a healthy order backlog will continue to buoy demand. Restrained capital budgets amidst macroeconomic uncertainty will be a drag on future growth.

PART K. MASS SPECTROMETRY

Overview

The mass spectrometry market comprises LC-MS, MALDI-TOF, SIMS, ICP-MS, magnetic sector and FT-MS instrumentation. Revenue estimates encompass initial systems, components, consumables, and service, but exclude analytical chemicals, considered elsewhere. Market demand increased by 8.1% in the third quarter of 2022 year over year, with strong demand for Tandem MS, LC-MS TOF, and FT-MS/Ion Trap MS.

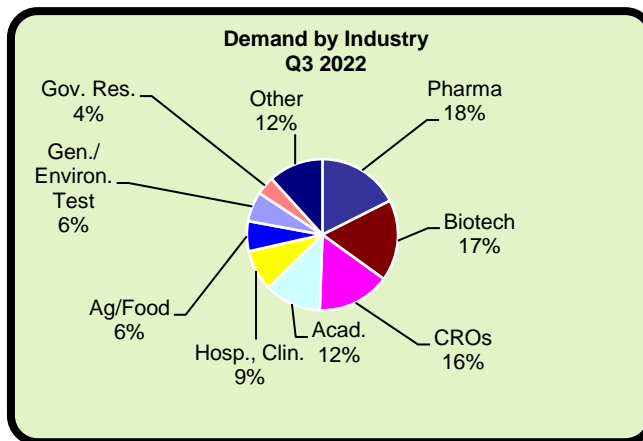


Regional Demand

Regional demand was led by the Asia-Pacific region. China in particular showed a strong quarter as easing lockdown measures allowed both vendors and customers to fulfill delayed orders in the region. North America continued its strong showing, bolstered by increased demand for tandem MS instrument for PFAs testing. Europe showed modest growth, but was hindered by currency headwinds. Japan struggled with unfavorable currency effects despite positive organic growth.

End-User Markets

Pharma, biotech, and CROs showed strong overall demand and growth during the quarter. LC-MS TOF and FT/MS systems benefited from an overall industry increase in proteomic, metabolic, and biomarker discovery research. Tandem MS instruments growth benefited from increasing demand from environmental labs and in ag/food for their applicability in water testing applications and for testing PFA compounds following EPA health advisories and testing level requirements for the most concerning PFA compounds.



Market Developments

Thermo Fisher launched the Orbitrap Ascend Tribid mass spectrometer for proteomic and metabolic research focused applications. Bright Giant and Agilent Technologies announced a new product development collaboration designed to enhance non-targeted metabolomics workflows. Bruker announced its latest MetaboScape 2023 release, providing streamlined collision cross section (CCS)

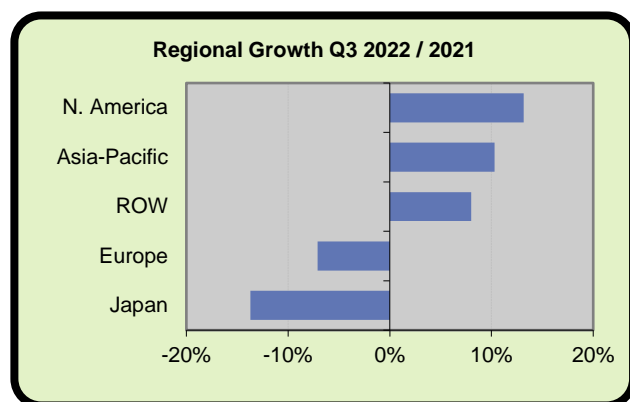
Near Term Prospects

Mass spectrometry growth is expected to stay strong for the final quarter of the year, but unfavorable currency conditions will take some wind out of the sales. Supply chain issues are still expected to delay order shipments and cause some bottlenecks. Customer layoffs may also effects some sales, such as those involved cell and gene application.

PART L. CELL ANALYSIS

Overview

The cell analysis market comprises flow cytometers, transfection, high content screening, and patch clamp systems. Revenue estimates encompass initial systems, components, consumables, and service, but exclude life science reagents, considered elsewhere. Market demand faced a tough comparison in the third quarter; with declining COVID-19 demand, supply chain constraints, and currency effects slowing growth to 4.3% year over year.

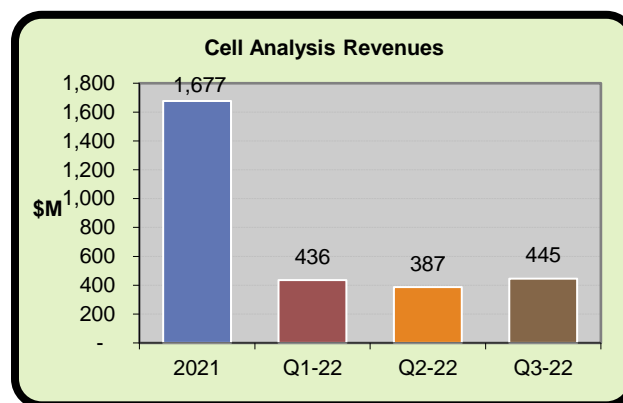


Product Segmentation

Cell analysis is largely consumables driven. This quarter growth in non-COVID-19 portfolios was the primary source of reagent demand. Cell and gene therapy contributed to transfection reagent demand. Initial systems grew in the mid-single digits led by flow cytometry and electroporation, making up about 20% of total demand. High content screening was mixed due to a receding COVID-19 demand juxtaposed with accelerated biomarker screening.

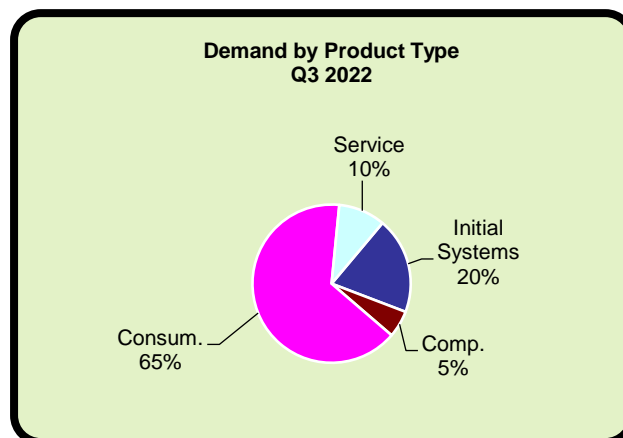
Market Developments

Beckman Coulter Life Sciences acquired Valita Cell, a biotech company that enables biologics and cell therapy applications. BD Biosciences increased their instrument output by stabilizing procurement of electronic components. Bio-Rad introduced the QX-200 droplet digital PCR system.



Regional Demand

Demand was mixed across regions. North America grew in the low double digits, trailed by Asia-Pacific and ROW customers, which also saw decent growth in the quarter. Cell analysis consumables and flow cytometry instrumentation were drivers. COVID-19 product demand declined globally, except in China, where the effect of the pandemic and zero-COVID policies support testing. Negative currency effects muted growth outside of North America.



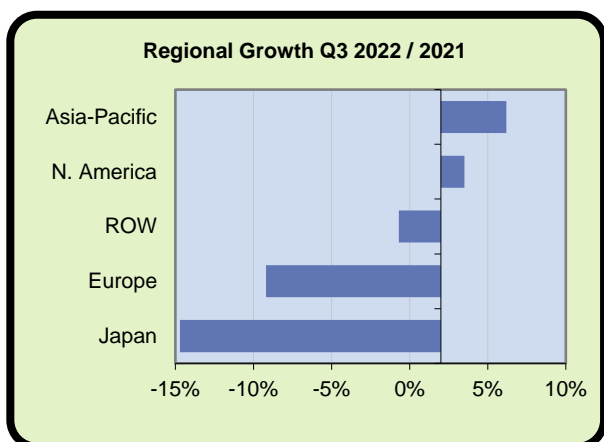
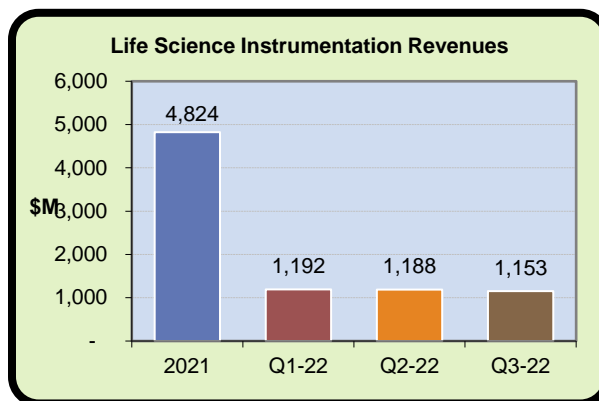
Near Term Prospects

Strong instrument demand will drive sales growth of flow cytometers and high content screening. However, a significant backlog of instrument orders will be carried forward due to electronic component shortages and supply chain constraints. As the dollar remains strong relative to major currency markets, negative currency effects will be a concern internationally.

PART M. LIFE SCIENCE INSTRUMENTATION

Overview

The life science instrumentation market comprises nucleic acid amplification/PCR, microarrays, sequencers, and electrophoresis hardware. Revenue estimates encompass initial systems, components, consumables, and service, but exclude life science reagents, considered elsewhere. The third quarter of 2022 continued to be challenging for vendors in the space, as unfavorable macroeconomic forces combined with a tough comparison to the previous year, creating flat market growth of 0.7%.



Regional Demand

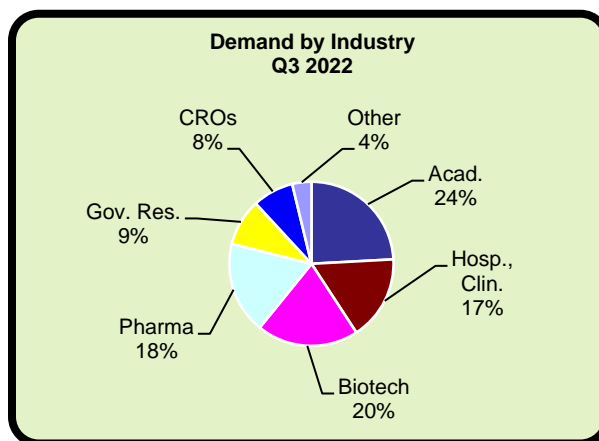
Currency effects created strong headwinds, negatively affecting revenues in all regions. Compared to a very strong US dollar, the euro fell to parity, sequentially recovering demand in China was offset, and Japan saw major declines. However, on a constant currency basis, all regions experienced growth.

In Europe, seasonal slowdowns of lab activities in the summer months and sanctions against Russia contributed to decline as well.

End-User Markets

The strength of the pharma and biotech industries in multiple regions offset soft demand among other end markets. Large molecule drug R&D was a major driver, prompting increased demand for proteomics-related techniques.

Demand for COVID-19 related products continues to decline strongly, affecting demand from the hospital/clinical end market, and also public sector entities as COVID surveillance efforts are scaled back.



Market Developments

In September, Danaher announced it will spin off its Environmental & Applied Science segment in 2023, which will become a separate, publicly traded company. In recent years, Danaher has bolstered its life science portfolio through acquisitions, and this reorganization will reflect a greater life science emphasis.

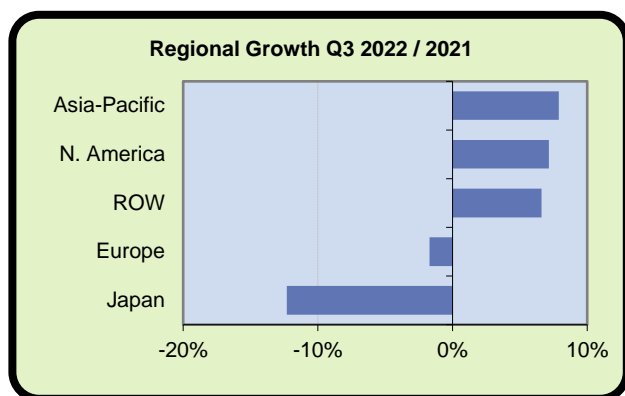
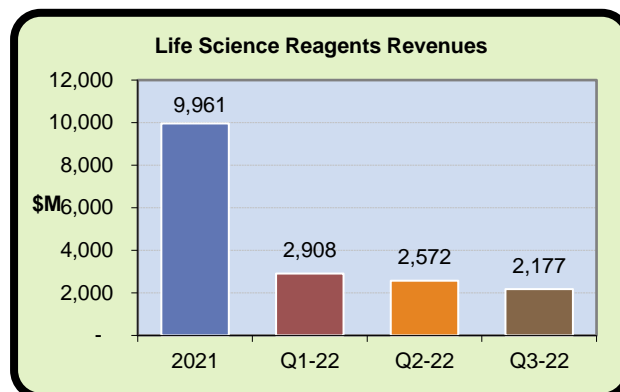
Near Term Prospects

The anticipated introduction of new generations of life science technologies has led some end-users to delay purchases. As new systems are launched in the coming months, demand for initial systems among several techniques is expected to expand.

PART N. LIFE SCIENCE INSTRUMENT REAGENTS

Overview

Products considered in this section are primarily consumables used with life science instrumentation, cell analysis, and laboratory automation systems. Total demand grew 4.7%. Declining COVID-related testing was one general barrier to growth. Significant negative currency effects of about 5% were another. The pharma/bio industry continued to drive overall growth for these products.

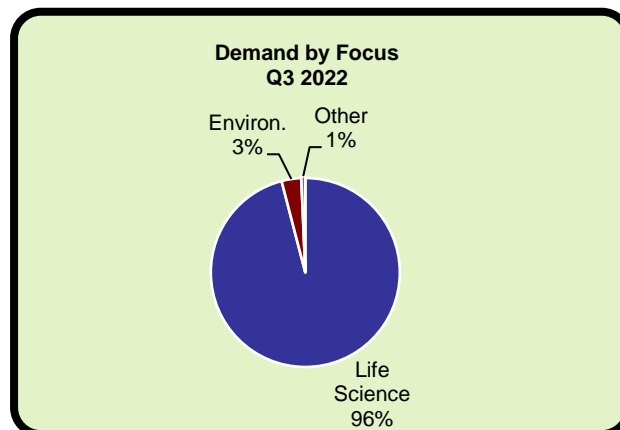


Regional Demand

Asia-Pacific slightly edged out North America to be the fastest growing region in the third quarter. India had a strong quarter for consumables, while China remained the largest individual source of Asian demand, though with less growth than India. North American growth stemmed from both public and private labs in the life sciences. European growth was organically fairly strong, but growth was wiped away by negative currency effects. The weakness of the yen also resulted in a significant decline in Japan.

End-User Markets

Naturally, these life science products are quite aligned with laboratories with a life science focus. Within that segment, there is considerable diversity. Healthcare-adjacent testing saw a decline due to what is hoped to be the denouement of the pandemic, at least as a crisis. Meanwhile, pharma/bio demand remained strong. Research-oriented labs are, despite some funding issues in the public sector, still increasing their demand for life science reagents, particularly in the pursuit of novel therapies and targets.



Market Developments

In its second quarter SEC filing, Bruker announced a \$5 million investment in AmberGen. That company's Miralys Spatial Biology Imaging Reagents for MALDI-IHC are currently in beta release. Biosynth Carbo-synth acquired two companies recently: Pepscan, which offers peptide-based products and services, and EUCODIS Bioscience, which provides enzyme engineering.

Near Term Prospects

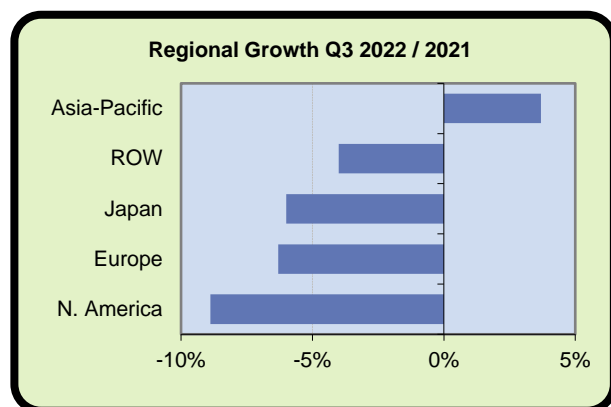
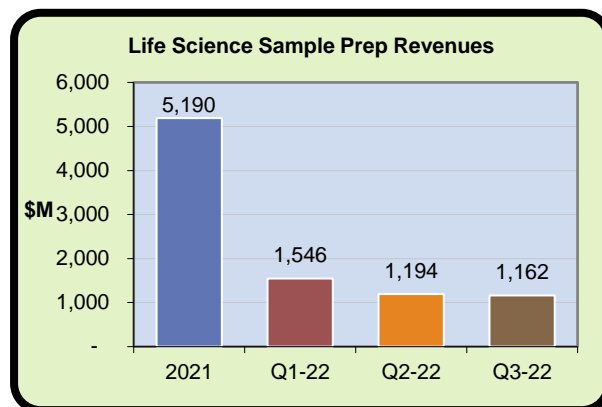
Slackening pandemic spending is having a negative effect on PCR and sequencing demand for reagents. If the onset of winter brings a rise in cases, this trend may reverse in certain regions. However, overall we expect declining COVID demand and growing research and development demand to partially offset, producing overall moderate mid single digit growth in the near term.

PART O. LIFE SCIENCE SAMPLE PREPARATION

Overview

Life science sample preparation includes both automated purification systems and magnetic bead purification systems, in addition to related components, consumables, and service. This segment does not include diagnostic applications, but instead focuses on life science research.

In Q3 2022, the market continued to contract compared to the previous year, as demand for COVID-19 related products declined. This was compounded by strong currency headwinds.



Regional Demand

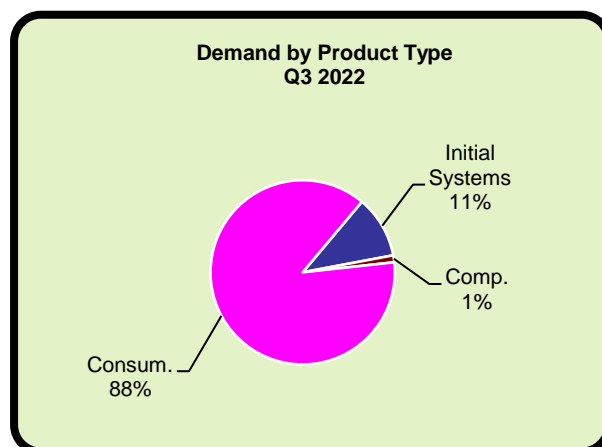
Declining demand for COVID-19 related products drove down demand for sample prep across nearly all regions. The exception was the Asia-Pacific region, where the demand in China began to recover from major lockdowns, though the threat of further lockdowns remains.

Negative currency effects were very pronounced in Q3, further depressing growth.

Product Segmentation

The life science sample preparation market is highly consumables-intensive, leading consumables revenues to dominate the market. While COVID-19 related sample preparation is declining in most regions, the volume of samples being prepared by end users in other markets is growing, with some vendors reporting record consumables sales in Q3.

Initial systems and consumables growth were flat for the quarter.



Market Developments

In September, BioEcho Life Science, a German supplier of nucleic acid extraction and analysis products, began operations at its US subsidiary.

Thermo Fisher Scientific launched Dynabeads Carboxylic Acid for RNA purification. The new product is suitable for isolating mRNA for vaccine development.

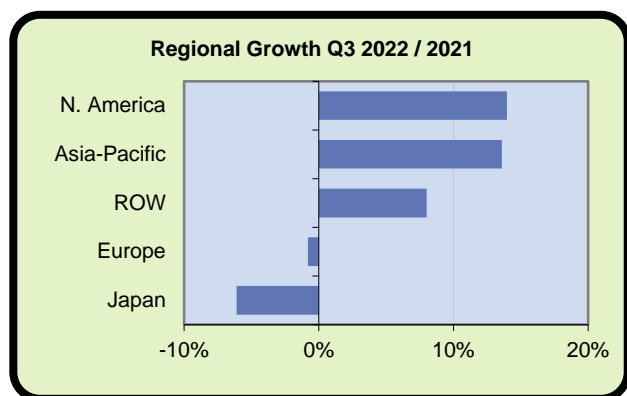
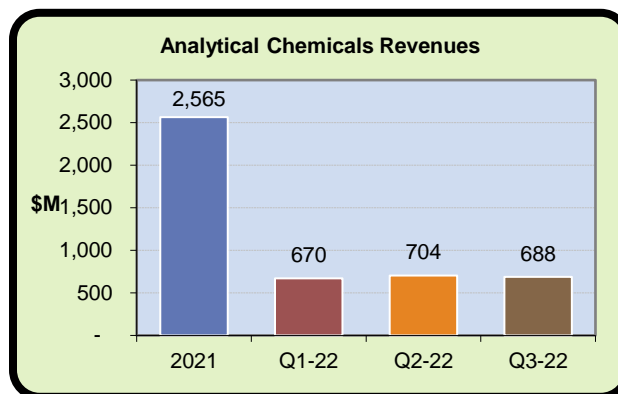
Near Term Prospects

Declining demand for COVID-19 related products will continue, though seasonal upticks are expected. But this decline is partially offset by brisk growth in oncology-related applications. Macroeconomic challenges and the completion of major population-scale genomics studies are also slowing the sample prep market.

PART P. ANALYTICAL CHEMICALS

Overview

Total demand for analytical chemicals and solvents grew 7.9% year-over-year; this is a sequential decline in growth, but considering currency effects, this reflects increasing organic growth sequentially. Chromatography, materials characterization and molecular spectroscopy were all techniques with greater than average demand in the third quarter.

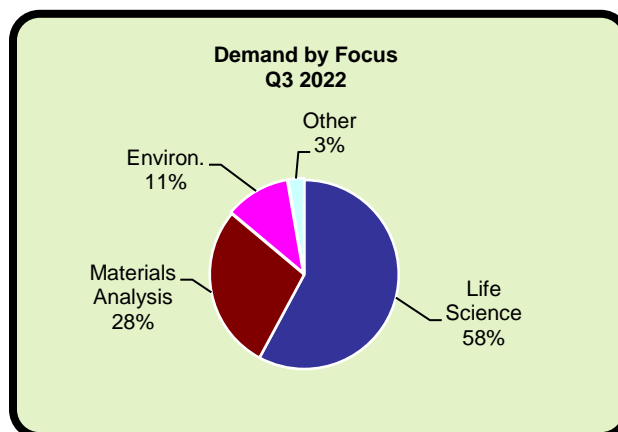


Regional Demand

North America and Asia-Pacific both experienced strong growth in the third quarter. Pharma/Bio customers in North America helped drive that region to the top, while the Asian markets were driven more broadly by both industrial and pharma/bio demand. Currency effects drove Europe and Japan into negative territory in terms of revenue in dollars. However, both experienced positive organic growth.

End-User Markets

Laboratories with a life science focus made up a narrow majority of demand in the third quarter. Generally speaking, pharma/bio customers are the strongest performing segment within life science. Materials analysis is the second largest focus segment, and in the third quarter, growth in life science and materials analysis were roughly equal. Materials testing and analysis was boosted by strength in the semiconductor and chemicals industries. Growth in this segment was slightly less than the overall average.



Market Developments

In August, Bio-Rad extended its range of StarBright Dyes for flow cytometry with the addition of one violet and two ultraviolet dyes, excited by 405 nm and 355 nm lasers. Also in August, Agilent acquired Polymer Standards Service, a provider of reference materials and other polymers for GPC/SEC chromatography.

Near Term Prospects

Growth has slowed marginally, but demand remains positive, supported by biopharma spending and rising prices. Traditionally, the fourth quarter is strong; while this will likely be true this year as well, many labs have already stocked and overstocked earlier in the year when supplies of some products were limited. This may limit fourth quarter growth.