

FROST & SULLIVAN

BEST PRACTICES

AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD



**2020 GLOBAL
PORTABLE NMR SPECTROSCOPY
COMPANY OF THE YEAR AWARD**

Contents

Background and Company Performance	3
<i>Industry Challenges</i>	3
<i>Visionary Innovation & Performance and Customer Impact of Nanalysis</i>	3
<i>Conclusion</i>	7
Significance of Company of the Year	8
Understanding Company of the Year	8
<i>Key Benchmarking Criteria</i>	8
Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices.....	10
The Intersection between 360-Degree Research and Best Practices Awards.....	11
<i>Research Methodology</i>	11
About Frost & Sullivan	11

Background and Company Performance

Industry Challenges

Nuclear magnetic resonance (NMR) spectroscopy is a critical factor in determining molecular structures in many chemical applications including material science and structural biology; however, this technique has a relatively low sensitivity due to the small magnetic polarization of the nuclei under investigation. NMR signal intensities can be low, with signal-averaging required to obtain a sufficiently high signal-to-noise ratio. Regardless, NMR spectroscopy provides so much qualitative and quantitative information it remains the most extensive product segment in the molecular spectroscopy market.

Despite being one of the most common techniques, NMR spectrometers suffer from challenges. The traditional high-field superconducting NMR spectrometers carry significant weight, coming in at more than ten times the weight of portable, permanent magnet-based instruments. Moreover, these instruments are considerably more expensive in both capital cost and operating expenses. NMR spectrometers start at \$300,000 and increase significantly with field strength, with some reaching more than \$1 million and costing up to \$100,000 per year to maintain, which includes financial costs such as staff salaries and cryogens. Thus, these inhibitors limit NMR technology, primarily for research-based applications, with only expert users capable of operating them.

In 2012, benchtop NMR spectrometers were introduced to combat these challenges, and provide another layer of NMR workflow. The benchtop NMR's miniaturization targets the need for increased accessibility of these techniques in laboratories, field analysis, and quality assurance and quality control environments. This largely unmet industry need is a low-cost, portable NMR instrument that possesses all the necessary features and functionalities required of a high-field NMR spectrometer, but with increasing automation and connectivity, enabling its use in several testing environments by many different user levels.

Visionary Innovation & Performance and Customer Impact of Nanalysis

Founded in 2009, Nanalysis is a global leader in portable NMR spectrometers for the laboratory instrumentation market. Credited with delivering the industry's first fully-featured 60 megahertz (MHz) benchtop NMR spectrometer, the Canada-based company continues to reach new heights through its regular innovations and market-leading technology. Nanalysis' NMRReady-60™ requires no liquid helium or any other cryogens and is suitable for all types of industrial applications, including oil & gas, pharmaceutical, biotech, and atomic agencies. Moreover, the company is a category leader in the academic teaching and research markets. Nanalysis continues to build on its technical foundation, launching products such as the NMRReady 60PRO™. This innovation features multinuclear and heteronuclear two-dimension capabilities, targeting researchers and industrial laboratories for complex chemical analysis.

Frost & Sullivan continues to marvel at Nanalysis' technological prowess, having earlier acknowledged the company as the 2016 and 2018 Company of the Year.

Enabling Industry Success

One of the prominent reasons for the acceptance of benchtop NMR is its accelerated result delivery besides being cryogen-free. These features omit the need for a cooling apparatus and weekly cryogen fills. In real-time industrial lab applications that require rapid results without commodity detriment, NMR provides data in as little as 15 seconds. For this reason, Nanalysis' NMR spectrometers maintain significant momentum in both academics and industries. The NMReady-60 spectrometer family of best-in-class portable NMR spectrometers meets the market requirements successfully. While less potent than a high-field spectrometer, the NMReady product portfolio possesses more chemical information than a relaxometer, which positions it for more NMR spectroscopy applications. Moreover, it provides point-of-need access as its compact shape enables it to fit in most places, providing opportunities for portability.

Forward-focused, Nanalysis maintains a vision for NMR accessibility, automation, and ease-of-use, as it identifies several commercial applications, which are the benchmark in analytical instrumentation and molecular structure identification. For example, in December 2019, Nanalysis entered into a partnership with the *Kriminaltechnisches* of the *Landeskriminalamt* of Lower Saxony to develop a mobile device to identify and quantify illegal street drugs. The company automated the benchtop-based testing method, so it does not require specialized knowledge for operating. Additionally, the test is nondestructive, ensuring use for repetitive testing and enabling sample handlers to adhere to the legal chain of custody requirements. The company reports that in addition to providing law enforcement with immediate analysis without network access, there is a possibility to leverage the cloud for more sophisticated processes and analyses, revealing a potential software-as-a-service opportunity for Nanalysis in the future.

Well-positioned for the Future

Nanalysis witnessed NMR evolve toward more significant and expensive hardware, during which the company focused on creating smaller, more intelligent NMR solutions. During this time, there was a fundamental shift in how the world metabolized information, which picked up significant traction with the inception of Industry 4.0 and the Internet of Things (IoT). Understanding that compact NMR will replace outdated, multi-step, expensive, sample-destructive, and environmentally unfriendly testing, Nanalysis reached out to partner with other companies in the compact NMR ecosystem to take a critical step closer to the "appification" movement.

Appification describes the move to replace websites and web pages with programs run by mobile operating systems and devices, with applications (apps) as the primary user interface, relegating the Internet as an underlying service layer. In this regard, the company continues to up the ante on its NMR spectroscopy portfolio, leveraging Industry 4.0 technology to deliver unbeatable value to its customers. Frost & Sullivan benchmarking research finds the NMR future lies in cloud computing due to the critical advantages achieved through IoT, such as centralization, remote monitoring, enhanced flexibility, and ease-of-maintenance. Furthermore, Nanalysis demonstrates how the

emergence and adoption of mobile apps creates incremental economic opportunities across entire global economic sectors. In service of this, Nanalysis employs critical strategic business objectives toward the application of NMR in Industry 4.0 environments using its leading permanent magnet-based compact NMR technology.

An example of the company's strategic initiatives working in service of Industry 4.0 is its continued partnerships with leading technology firms. In January 2020, Nanalysis partnered with SARTEC, a company that creates proprietary machine learning algorithms and artificial intelligence (AI) software. The collaboration enables both companies to merge their respective technologies to help bring oil and gas refineries into the digital age. Nanalysis' portable, compact NMR hardware delivers fully integrated solutions by pairing well with SARTEC's machine learning and AI technology.

Industry-leading Differentiation

Benchtop NMR offers an affordable means to overcome barriers that prevent access to NMR, empowering users, such as students, at any level to develop their experimental skills. Nanalysis strengthens its portfolio while simultaneously circumventing these barriers, achieving a first-mover advantage in two areas. First, its NMRReady is the only all-in-one benchtop NMR spectrometer in its class, and second, Nanalysis is the only company with 100MHz spectrometers in the market. With the magnet, the electronics, and the computer in one enclosure, the company's NMRs are light-weight, simple-to-site, while still rugged enough to withstand the rigors of a busy laboratory environment.

One of Nanalysis' key value propositions is the intrinsic ease-of-use and low-maintenance aspects of its NMR spectrometers. For both, the 100e and 100PRO NMR, the permanent magnet does not require cryogenics, weekly servicing, or preventative maintenance, which significantly cuts down the operational expenses. Moreover, with standard five millimeter NMR tubes and automated shimming routines, the 100MHz NMRs plug into a standard wall power outlet for daily use without requiring experts to operate and maintain it.

Moreover, the company builds additional value into its 100MHz portfolio through innovative features that benefit the user:

- Both offer 25% higher resolution than its competitors, affording improved peak separation and sensitivity, while still maintaining an accessible, all-in-one footprint.
- As the "next evolution" in benchtop NMR spectrometers, the 100MHz possesses multiple convenient access connection ports in both the front and rear of the spectrometer, allowing for simple data transfer access.
- Nanalysis designed its 100MHz for integration into a customer's existing laboratory. It features several secure and accessible connectivity options for data to be exported and worked up in third-party software programs.

Moreover, the 100MHz comes standard with fully adjustable experiments for immediate results and customizable parameters. With a versatile user interface, users can operate the instrument with a touchpad, a keyboard and mouse, or through an external computer, helping users load standard experiments, design pulse experiments, and queue

experiments with automated analysis. Low-cost, compact, faster analysis time, flexibility and simplicity are the key advantages of Nanalysis NMR benchtop spectrometers. The company also partners with accessory manufacturers that help Nanalysis provide a holistic approach and a one-stop-shop provider that makes it easy for customers to get the entire product package at a single place.

Best-in-class Customer Experiences

To ensure its customers are well-served around the world, Nanalysis places equal focus on direct and indirect sales. The United States, Canada, Switzerland, and Germany receive direct sales with its own sales force. For other countries, such as Japan, Indonesia, Argentina, Australia, and the United Kingdom, Nanalysis sells through regional support partners and distributors. The company's relationships with its sales partners are a critical success factor, as some of these partners have been serving the industry for more than 40 years. Today, Nanalysis has channel partners in more than 40 countries, which ensures that end users receive superior service.

The company focuses a lot of energy on maintaining best-in-class customer experiences through its services and precise design of its instruments. Nanalysis differentiates itself from its competitors through its consistent customer communication and collaboration before purchase, ensuring they understand the instrument and how it works within their facility, answering customer questions, run samples for proven results, all while maintaining a patient approach.

Networking for High-quality Service

Providing comprehensive service to customers is a critical focus for Nanalysis, as close communication with its customers is a core pillar for the company. To this end, Nanalysis engineered proprietary software that connects its instrument to the Internet while bypassing any sensitivity issues. The software features the company's tried-and-true simplicity, as any level user can connect to Nanalysis' service cloud environment for after-sales updates on firmware or software. The company's focus on NMR spectrometers for the analytical domain enables it to target customers in various end-user industries.

Furthermore, Nanalysis extends this service excellence to its distributors, ensuring they understand the company's spectrometers' features and functionalities, enabling distributors to provide customers with limited support from the manufacturer. This targeted approach and expertise strengthens Nanalysis' position and reputation and helps the company expand its customer-base and increase its market share.

Internal Strength

Nanalysis' success largely stems from its intellectual property, which combines its core technology with its expertise. The company adds its proprietary electronics and software to its high-performance, compact magnets, which results in uniform and stable magnetic fields. The main purpose in this manufacturing process is to refine and support the growth of its technology profile, which means improved component magnet quality assurance, continued improvements to the external lock technology, and shimming for and assembly

of magnets. This advanced innovation renders its manufacturing extremely difficult to reverse engineer, well-positioning the company for market leadership.

Nanalysis takes a targeted approach to increasing its brand strength, executing a four-pronged strategy to marketing: digital, event, application development, and distributors.

- **Digital:** the company leverages the Internet for marketing potential, using websites, email, third-party listings, pay-per-click, search engine optimization, geographical and personal targeting, as well as video presence.
- **Event:** Nanalysis attends more than 20 conferences per year and another 75+ via distributors. To maximize its event marketing, it also offers product launches, press releases, webinars, workshops, and print ads. Moreover, its international offices put it closer to other markets.
- **Application Development:** Nanalysis collaborates with different companies to expand its presence and evolve its technology. Moreover, it also produces publications and achieves varying certifications, positioning it as a strong performer and knowledge-leader in the industry.
- **Distributors:** The company ensures its distributors are knowledgeable, sending them to conferences and empowering them with application notes, digital listings, and workshops to strengthen their knowledge-base.

Frost & Sullivan finds Nanalysis demonstrates its thought leadership through its comprehensive knowledge, versatile portfolios, best-in-class service, and ongoing innovative process.

Conclusion

Although nuclear magnetic resonance (NMR) is one of the largest market segment in the well-established molecular spectroscopy vertical, traditional equipment is large, heavy, and expensive, reaching costs as high as \$1 million. With miniaturization as a paradigm in the current scientific instrumentation world, Nanalysis focuses its research and development of compact, portable benchtop NMR spectrometers. The company achieves first-mover positioning as its NMReady and 100MHz product lines differentiate from the competition in critical areas: the NMReady is a one-stop-shop, and the company possesses the first 100MHz spectrometer technology on the market. Nanalysis' focus on portable benchtop devices is vital to its organic growth. With its products' ease-of-use, affordability, manageable size, and portability, the company is well-positioned to gain more traction and market share. With more than nine years of technical expertise and working closely with end-users, Nanalysis expects to maintain its market leadership in the portable benchtop NMR spectrometers market.

For its first-mover advantage, differentiating technology, best-in-class manufacturing process, industry-leading product portfolios, and strong overall position, Nanalysis earns Frost & Sullivan's 2020 Company of the Year Award for the Global portable NMS spectroscopy market.

Significance of Company of the Year

To receive the Company of the Year Award (i.e., to be recognized as a leader not only in your industry, but among non-industry peers) requires a company to demonstrate excellence in growth, innovation, and leadership. This excellence typically translates into superior performance in three key areas—demand generation, brand development, and competitive positioning—that serve as the foundation of a company’s future success and prepare it to deliver on the 2 factors that define the Company of the Year Award: Visionary Innovation and Performance, and Customer Impact).



Understanding Company of the Year

Driving demand, brand strength, and competitive differentiation all play critical roles in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on Visionary Innovation and Performance to enhance Customer Impact.

Key Benchmarking Criteria

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated each factor according to the criteria identified below.

Visionary Innovation & Performance

- Criterion 1: Addressing Unmet Needs
- Criterion 2: Visionary Scenarios through Mega Trends
- Criterion 3: Implementation Best Practices
- Criterion 4: Blue Ocean Strategy
- Criterion 5: Financial Performance

Customer Impact

- Criterion 1: Price/Performance Value
- Criterion 2: Customer Purchase Experience
- Criterion 3: Customer Ownership Experience
- Criterion 4: Customer Service Experience
- Criterion 5: Brand Equity

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify Award recipient candidates from around the globe	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies 	Pipeline of candidates who potentially meet all best-practice criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized Award candidates
6 Conduct global industry review	Build consensus on Award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible Award candidates, representing success stories worldwide
7 Perform quality check	Develop official Award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best-practice Award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select winner 	Decision on which company performs best against all best-practice criteria
9 Communicate recognition	Inform Award recipient of Award recognition	<ul style="list-style-type: none"> • Announce Award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10 Take strategic action	Upon licensing, company able to share Award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess Award's role in future strategic planning 	Widespread awareness of recipient's Award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.