

# Rudolph Technologies and Nanometrics merge to form **Onto Innovation**

Silicon Semiconductor technical editor Mark Andrews recently spoke with Onto Innovation's CEO Mike Plisinski about the merger of Nanometrics and Rudolph Technologies. Plisinski explores the benefits, challenges and opportunities of forming a new semiconductor supply chain entity by combining two industry leaders.

**MA** – *When resources combine post-merger, each company contributes expertise, viewpoints and strategies which creates both challenges and opportunities. Looking at the merger from the perspective of each company, what are the primary near-term benefits and what might the industry expect from Onto Innovation over time?*

**MP** – When I think about the benefits of the merger, I put them primarily in three categories: scale, scope, and synergy. Onto Innovation is now the fourth largest (by revenue) wafer fab equipment supplier in the U.S. and among the top 15 in the world. We have over \$300 million in cash, cash equivalents or marketable securities and no debt. That gives us a lot of options to invest in our future. We are one of a few companies that is an end-to-end supplier, with products and applications ranging from unpatterned wafer quality, through advanced front-end metrology and macro defect inspection to advanced packaging lithography and inspection in the back-end, with enterprise software solutions spanning the entire value chain.

The synergies between Nanometrics and Rudolph were tremendous, with the positive complementary product lines, markets and organizations with no overlapping products. Nanometrics' strengths were in the optical metrology space where the company had been quite successful with the top manufacturers in the industry. While Nanometrics' metrology sales were concentrated at relatively few customers, those customers were industry leaders in the front end, producing advanced nodes. Rudolph's strengths were in different product technologies: macro defect inspection, acoustic metrology, advanced packaging

lithography and software, serving a much broader customer base. Yes, some of the same customers, but the Rudolph customer base was fairly diverse across the entire supply chain. So, by bringing these companies together, we now have a broader product portfolio to offer to a broader customer base and those products have very little to no overlap.

The two companies were built around the same core competencies in software and optics. So, R&D investments are magnified. Let's say we develop a new artificial intelligence engine for fab wide software. We can apply that to help with automatic defect classification in our inspection systems and now to optical metrology as well. The same goes for optics. If we're developing new high-speed camera technology or new illumination technology, we can apply it across a broader set of product lines. We will ultimately develop common platforms, common staging, common end effectors, robots, etc. All that provides tremendous leverage on the R&D investment.

One other point relates to the commonalities of the two companies. We share a common understanding of our products and markets. Putting two companies together that don't share that common understanding and background can be very challenging. Without it, decision making processes can easily become contentious, based on emotion and descending quickly into chaos. With it, discussions stay focused on the facts, on the merits of the case. It was an important consideration in our evaluation of the integration risk. I know it resonated strongly with both boards of directors.

With regard to longer term benefits, we expect some gains in our existing markets as well as expansion of our SAM (served available market). What we ultimately want to do is expand our TAM (total available market) by developing new products and technologies and entering new markets. With two healthy companies coming together there will be some immediate gains in efficiency, primarily from cutting out duplicate public company expenses, but we also have substantial financial resources available to invest. There are opportunities to gain share by combining technologies to open up other aspects of the optical metrology market, like planar films, that we are not serving now. We're also looking at ways to bring software onto the metrology platforms to make them even more competitive and differentiate them in ways that competitors can't match. It is the same approach that was successful for Rudolph for inspection and lithography. There are other options to consider as well, including further M&A activity to accelerate our entry into other markets and expand our SAM and TAM.

**MA** – *Why now? Can you point to any events or trends that made this the right time to merge?*

**MP** – I get that question a lot. Neither company was dying, neither company was even sick. Both had growth, both had strong operations and financial statements, etc. The better question might be why did it take so long? And I would say there is no real answer to that. Different personalities, different points of view. Finally, the viewpoints converged. The importance of software was becoming more and more clear and it's not easy to build the kind of software assets Rudolph had. I also believe that, with the consolidation in the industry, the importance of diversity became clearer and more critical to Nanometrics. I think Rudolph saw the exploding growth in the logic and memory spend and they were only partly participating in it. The two boards started to see that a merger really did make sense, that it was an enhancement more than a change in direction.

**MA** – *Since the two companies that have merged are well known within the industry, why not use one name or the other rather than an entirely new name, or is that the point?*

**MP** – That is exactly the point. A lot of investors ask that, and customers do too. Both companies had strong brand recognition and long histories – Rudolph from the 1940s and Nanometrics from the 1970s. It is not easy to walk away from such strong legacies, but we are building a company for the future and the future is changing dramatically. What each brand was known for did not really reflect the power and the focus and the potential for this new company in the future. We wanted to reflect the new world moving forward. The pace of innovation is only going to accelerate. We are constantly looking to the future. The electronics/semiconductor market is no longer

just the PC/server refresh. Technology is part of every aspect of people's lives. So, Innovation, because we are always looking toward the next innovation, and Onto, because it brings a sense of movement and immediacy. We also did not want to be tied to any specific market. We want a new name that reflects the exciting potential we see.

**MA** – *2019 has been a tough year for many across the semiconductor industry supply chain due to the fact that two of its largest host countries (the US and China) have been in a months-long trade dispute. Is this situation creating new opportunities or challenges for Onto Innovation as 2020 begins?*

**MP** – China has been a source of great growth for both companies. So, of course the trade situation has impacted us, but we are still doing very well. Bringing the companies together only allows us to serve our Chinese customers better. Both companies' technologies are clearly important to the Chinese markets because both have seen great growth, and that we expect that to continue. Business in 2019 was down but I think the trade dispute was a minor consideration.



Memory and smartphone adoption were down, but the refresh cycles haven't really occurred. So, there was sort of a natural slowdown. But logic is growing, and certain advanced packaging. Even though it's slowing, memory is transitioning from wire-bonding to advanced packaging and that's an opportunity for us. One of the benefits of bringing these companies together is that it should mute some of these cycles by having more diverse platforms, portfolios and markets.

**MA** – *Identifying and controlling defects; eliminating potentially damaging contaminants from process flows and related tactics/strategies are all common for work at the extreme limit of CMOS scaling – Does the merger primarily benefit companies working at 7nm and below, or seen another way, what benefits could MEMS makers and others such as power device manufacturers gain from the merger?*

**MP** – The merger does not enhance, specifically, our ability to do something at 7-8nm. There are areas where we may leverage our software or other core technologies to enhance the value of our tools for 8nm and below. For example, we may be able to leverage acoustic technology to enhance signal generation. Advanced nodes require higher quality wafers and we have seen increasing demand for our bare wafer edge inspection technology.

We also see opportunities to go the other way, taking advanced film metrology and optical metrology from sub 8nm into other markets and specialty devices. Wafer handling requirements for a lot of these specialty devices are very different from the traditional front-end requirements. Rudolph already had the handling and it may enable us to go after specialty applications for optical metrology that Nanometrics could not pursue because developing the handling was too expensive.



**MA** – *Every merger brings with it good and bad prospects: economies of scale can be optimized, but this sometimes leads to job cuts. A fresh approach can benefit growth opportunities, but the challenge of melding two corporate cultures can be considerable. Can Onto Innovation delve into what they see occurring in the next few years in terms of both challenges and benefits?*

**MP** – Integration strategies generally fall somewhere between two extremes. Either you force an immediate integration of everything and risk creating chaos because everything changes. Or you let them run more or less independently in the hope that they will merge naturally over time.

Unfortunately, this often results in the creation of silos that grow apart rather than together. We have tried to follow a middle path that balances between silos and forced integration, trying to address integration issues in the most sensible way on a case-by-case basis. In our organization, individual business units are responsible for R&D.

We combined metrology R&D from both companies together under one leader. But R&D for the other business units is largely staying focused on what they did, so not a lot of chaos. But we did centralize each of the manufacturing, marketing, and sales organizations. In manufacturing, one leader looking across the whole company is better able to see things like supply chain opportunities. In marketing, we have all the product lines under one group, so they are better able to develop a coherent Onto Innovation strategy and message. As for staff reductions, the lack of overlap has kept them very few.

The real focus has been on driving efficiency and driving the positive synergies through organizational development. This really leads back to the commonality between the two companies' cultures that I mentioned earlier.

That common understanding makes it easier to choose the best people for each role and balance between silos and forced integration. R&D is probably hardest to get the synergies. Supply chain, manufacturing improvements, channels to market, those are the quicker and easier places to find synergies.

We were both American companies with similar business cultures: competing on value, competing on technology, understanding the importance of the pace of innovation, emphasizing profitable growth. Shared values make it a lot easier to avoid constant fighting.

If we are considering a big R&D spend, we share a common set of criteria for the decision. We go through a disciplined process and that is engrained in our common culture. I've been very pleased by the progress we have made in only a few short months.