ISSN 2836-5313

Applied Technology Review APAC

TECHNOLOGY TO FACILITATE BUSINESS
APPLIEDTECHNOLOGYREVIEW.COM

TOP NANOPARTICLES AND MICROPARTICLE MEASURING EQUIPMENT IN APAC 2025

TOKYO DYLEC CORP

THE PRECISION SCIENCE BEHIND EVERY TRUSTED PARTICLE MEASUREMENT

Yoshiaki Shirai,
President and CEO

TOP NANOPARTICLES AND MICROPARTICLE MEASURING EQUIPMENT IN APAC 2025

Tokyo Dylec Corp

This award is in recognition of **Tokyo Dylec Corp's** stellar reputation and trust among customers and industry peers, evident in the numerous nominations we received from our subscribers. **Tokyo Dylec Corp** emerged as the **Top Nanoparticles and Microparticle Measuring Equipment in APAC 2025** after an exhaustive evaluation by an expert panel of C-level executives, industry thought leaders, and our editorial board.

Awarded By
Applied Technology Review APAC
ISSN 2836-5313

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In controlled lab environments, achieving particle measurement precision is rarely the issue. But outside the lab, where temperature, humidity and flow dynamics can shift without warning, particle behavior becomes less predictable, and the true resilience of a measurement system is tested.

Even the slightest misread in nanoparticle size distribution or aerosol concentration under fluctuating environmental conditions can lead to cascading consequences, like compromised product quality, failed compliance checks or a breakdown in trust across critical systems. The question isn't whether a device can deliver accuracy under optimal lab settings; it's whether that accuracy holds when the real world sets in.

That's the space where Tokyo Dylec Corp (TDC) has distinguished itself for over 30 years.

The company provides high-resolution particle and aerosol measurement systems that embed scientific rigor, real-world testing and long-term calibration into every deployment.

TDC's process begins well before the sale, with in-house sample testing and simulated operating conditions that reflect the customer's actual environment. The systems-first approach recognizes that in nanoparticle and microparticle applications, precision is only meaningful if it survives variability. Each instrument is calibrated not just to measure, but to maintain integrity across changing environmental parameters.

> **Long before particle characterization became central to semiconductors, clean energy platforms and environmental monitoring, we were developing the instrumentation that allowed those capabilities to take shape across Asia's industrial and research ecosystems**

Yoshiaki Shirai,
President and CEO

That difference is what keeps clients coming back to TDC, because when the measurement system is reliable, the data is no longer second-guessed.

The trust has only deepened as the role of particle measurement has expanded.

"Long before particle characterization became central to semiconductors, clean energy platforms and environmental monitoring, we were developing the instrumentation that allowed those capabilities to take shape across Asia's industrial and research ecosystems," says Yoshiaki Shirai, president and CEO.

Today, that foundation supports a wide range of high-impact applications, including evaluating submicron filtration efficiency, testing indoor environmental conditions and simulating complex atmospheric scenarios. Through it all, TDC remains accountable for what its instruments report, ensuring that every measurement is reliable, reproducible and ready to stand up to scrutiny.

MEASURING WHAT OTHERS CAN'T SEE

Most scientists would say measuring particles below 20 nanometers is unreliable. At this scale, optical methods like dynamic light scattering (DLS) begin to break down. Signal drift, environmental variability and particle-specific behavior—shape, charge and concentration—introduce inconsistencies that render the data increasingly fragile. But for TDC, that's not the limit. It's the entry point.

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Whether it's a research scientist trying to meet a strict validation deadline or a multinational manufacturer seeking to scale semiconductor yield, they can expect real engagement. Clients know they will get a solution that TDC will stand behind

Rather than relying exclusively on optical inference, it applies a condensation particle counter methodology, condensing vapor onto individual nanoparticles to enlarge them for optical detection. The approach allows for direct, high-fidelity particle counting well below the threshold of DLS, even under unstable environmental conditions.

Here's how it works. Nanoparticles are pulled into a heated saturator, where they are exposed to alcohol vapor. The saturated air then passes through a condenser, triggering supersaturation. Vapor condenses on the nanoparticles, forming droplets large enough to be detected optically. The outcome is a consistent, traceable measurement of particles that fall below the limits of conventional detection.

TDC designs for trust. Its dustiness evaluation systems, for instance, align with leading global standards, including REACH (EU), Blue Angel, EURO 7, China 7 and Tier 4, providing accurate emissions profiling for clients working across exhaust systems, brake materials and toner-based applications. These systems don't just solve engineering problems. They enable companies to confidently meet international compliance thresholds.

DELIVERING THE ART OF PARTICLE CLASSIFICATION

Detecting particles isn't enough. Charge, composition and mobility determine whether a material meets performance specs, passes regulatory review or causes cascading process failure. That's why TDC integrates differential mobility analyzers (DMA) into its system to measure size in isolation and classify particles based on their electrical mobility under controlled conditions.

At the one-nanometer scale, physics no longer behaves conventionally. Air begins to act more viscously than a fluid. Surface forces outweigh mass and inertia. And particle classification becomes a study in precision drift.

TDC's DMA draws charged particles toward a central electrode. Smaller particles having higher mobility accelerate faster and separate along predictable lines. When combined with the company's proprietary spray-drying technology, this method allows for precise classification, even from wet samples and complex suspensions, at resolutions most systems can't approach.

This capability is a game-changer for industries that depend on the purity, uniformity and predictable behavior of ultra-fine materials.

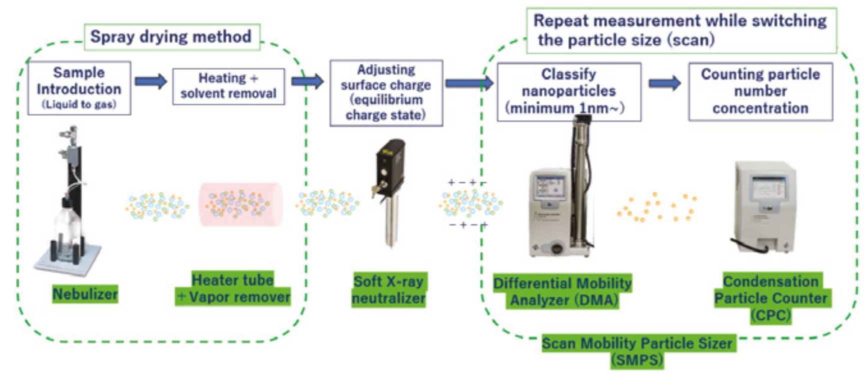
"Controlling single-nanometer particles isn't just about better science," says Shirai. "It's about helping industries meet tomorrow's standards before they arrive."

In advanced semiconductor manufacturing, for example, being able to identify contaminants at the 1-nanometer threshold can be the difference between wafer yield and production shutdown. From CMP slurries to cleaning solvents, it provides the clarity to maintain consistency at every stage.

INSTRUMENTATION THAT SHAPES POLICY

TDC's measurement devices have enabled the Japanese government to assess, regulate and ultimately reduce PM2.5 levels. In 2021, the Ministry of the Environment announced that all regions in Japan met PM2.5 environmental standards—a feat made possible, in part, by TDC's instruments.

Today, TDC provides roughly 30 percent of Japan's automatic measuring stations and 70 percent of its PM sampling systems. To meet stringent regulations, it collaborates with the institutions that establish them, ensuring its tools stay relevant as new scientific and environmental demands emerge.



Roughly 15 percent of the company's resources are allocated to research and development. But what makes that investment stand out is how it is embedded in the national science strategy. TDC works directly with research bodies such as JAXA and RIKEN, as well as academic leaders from the University of Tokyo, Kyoto University, and Tohoku University, forming technical alliances around real-world challenges—from aerosol behavior modeling to next-generation particle synthesis.

One result of this collaborative posture is the VSP-P1 nano printer, a system designed to create nanoporous coatings from sub-20 nm inorganic particles without the need for surfactants. It gives researchers a precise and contamination-free way to print functional layers using any conductive or semiconductive material, enabling breakthroughs in fuel cells, sensor technology and catalytic surfaces.

Unlike conventional methods that require complex preprocessing or wet chemistries, the VSP-P1 uses gas-phase synthesis to deposit particles directly onto substrates. It supports various materials, from metals to semiconductors and delivers contamination-free results.

SUPPORT THAT STAYS ON-SITE

One of TDC's strengths is its soft infrastructure, which encompasses aspects such as flexibility, responsiveness and post-sale service, all of which contribute to building brand equity.

From the first point of contact, it treats every engagement as a collaboration. It provides pre-purchase testing with demo units, post-installation calibration and ongoing maintenance, all handled by in-house engineers who understand both the instruments and the science behind them.

That kind of continuity builds something more durable than contracts. It builds trust.

Whether it's a research scientist trying to meet a strict validation deadline or a multinational manufacturer seeking to scale semiconductor yield, they can expect real engagement. Clients know they will get a solution that TDC will stand behind.

It may appear modest in terms of employee headcount, but TDC's global footprint and technical expertise tell a different story. Its client list reads like an industry index; Canon, Sony, Toyota, Panasonic, Mitsubishi, Daikin, Denso, 3M, JAXA, NIES, NTSEL and dozens more. Each sees TDC not as a vendor, but as a technical ally.

As Shirai puts it, "We succeed when our clients succeed. That's the only metric that matters."

THE PARTICLE STANDARD ACROSS INDUSTRIES

TDC's role in innovation extends beyond instrumentation. Across sectors, its systems have become essential to managing risk, precision and performance at the particle level.

In semiconductors, the systems are embedded in contamination control protocols for next-generation chip fabrication. In the medical field, TDC co-develops aerosol exposure systems that simulate real-world infection risk, from bacterial transmission to indoor air quality during pandemics. And in carbon capture and clean energy, its tools detect radioactive particles and diagnose failure points in CO_2 absorption systems.

Whether fuel cell materials, toner particles or filtration membranes, TDC helps turn microscopic uncertainty into valuable insight, replacing blind spots with measurable control.

THE NANOTECH BEHIND BIG PLANS

TDC's role in nanoparticle science is no longer confined to the lab or the production line. Increasingly, its expertise is shaping policy, guiding national priorities and influencing how countries prepare for the next generation of environmental and energy challenges.

That relevance is apparent in the context of Japan's Green Transformation (GX) strategy—a sweeping plan that channels 150 trillion yen in public-private investment toward decarbonization, hydrogen energy and advanced materials. With its track record in particle analysis, contamination control and nano-scale fabrication, TDC is already part of the foundation being laid for this transformation.

In a world recalibrating around nanometers, carbon budgets and molecular thresholds, TDC stands as both a mirror and a compass, reflecting what matters today while pointing to what's next. This is not just another case of advanced instrumentation meeting niche demand. It is the scaffolding for next-generation innovation, built particle by particle.

TDC's instruments may be designed to detect the invisible particles. But its impact is visible in the stability of semiconductor fabrication, public air safety, reliability of national standards and how entire industries solve what once seemed unsolvable.

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Published from
200 SE 6th St STE 505
Fort Lauderdale, FL

www.appliedtechnologyreview.com